

A man with grey hair and a beard, wearing a dark red sweater, is seated at a modern, light-colored desk. He is looking at a computer monitor. The desk is equipped with a keyboard and a mouse. In the background, there are large windows and a modern office interior. Overlaid on the scene are various futuristic digital elements: a glowing blue grid pattern on the ceiling, a complex network diagram with nodes and lines floating in the air, and a large, semi-transparent digital screen displaying technical data and graphs. On the desk, there are also glowing blue wireframe models of a cylindrical structure and a rectangular building-like structure.

SIEMENS

Desigo CC Diagnostic

DCCdiagnostic EM

[siemens.com](https://www.siemens.com)

General information

Changes

Version	Date	Author	Remark
1.0	23.08.2022	Peter Schaefer RC-DE SI RSS-DE SSP COC-SOL	Document created

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1. Starting situation

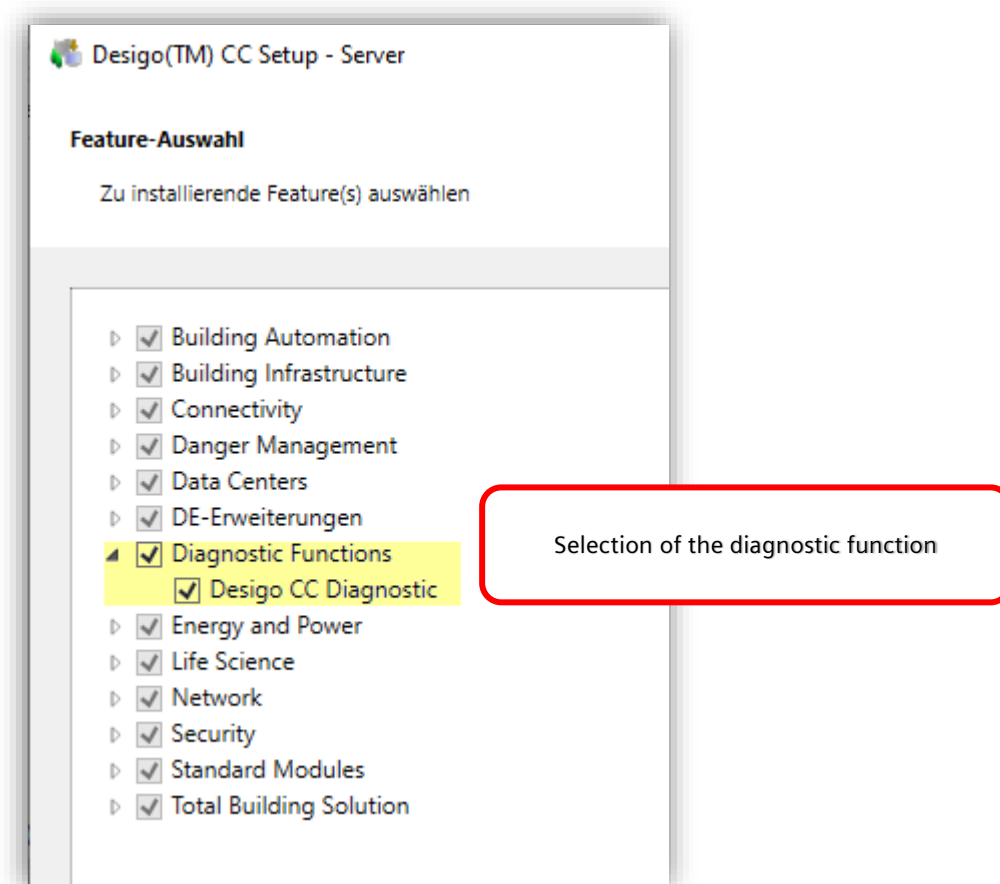
The DCCdiagnostic EM is intended to serve the following purpose:

- Documenting the configuration of the system
- Locate common errors in the project
- Finding errors that can lead to instabilities
- Identify and locate engineering errors
- Avoid possible overloading of sql server

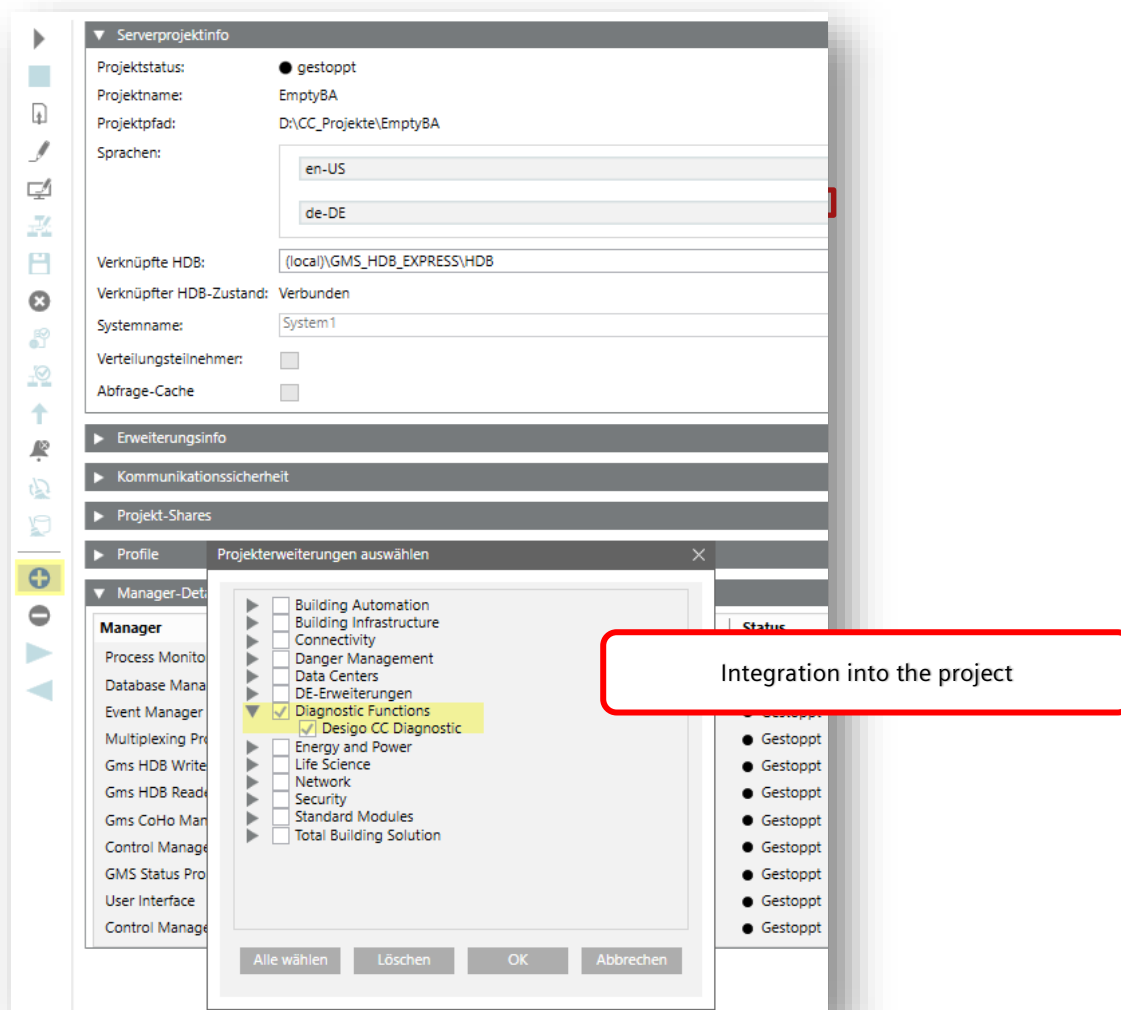
2. Installation

The DCCdiagnostic EM, like all other EMs, is integrated into the system using the Desigo CC Installer.

2.1 Installation ins System

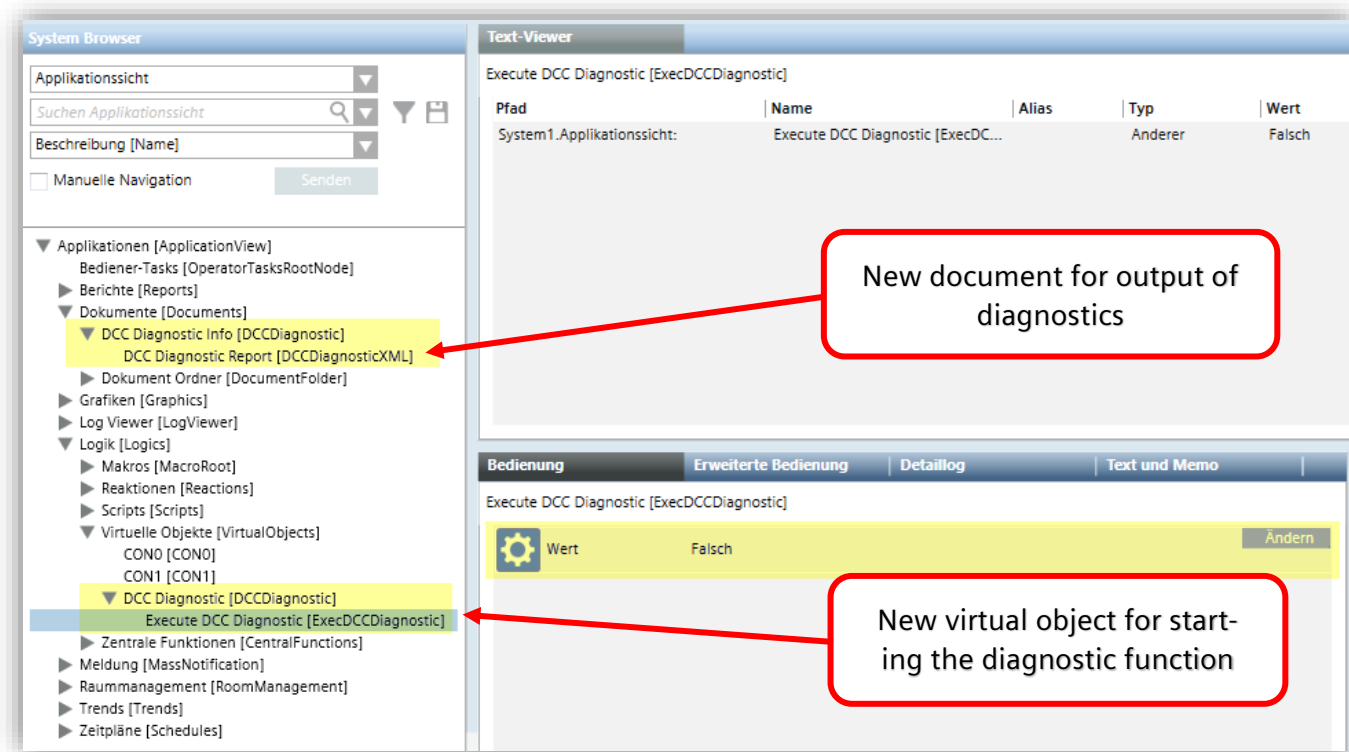


2.2 Integration into the project



2.3 Extension in the project

After adding it to the project, a new document is created to display the report after the diagnostics have been executed and a "virtual object" to start the report.

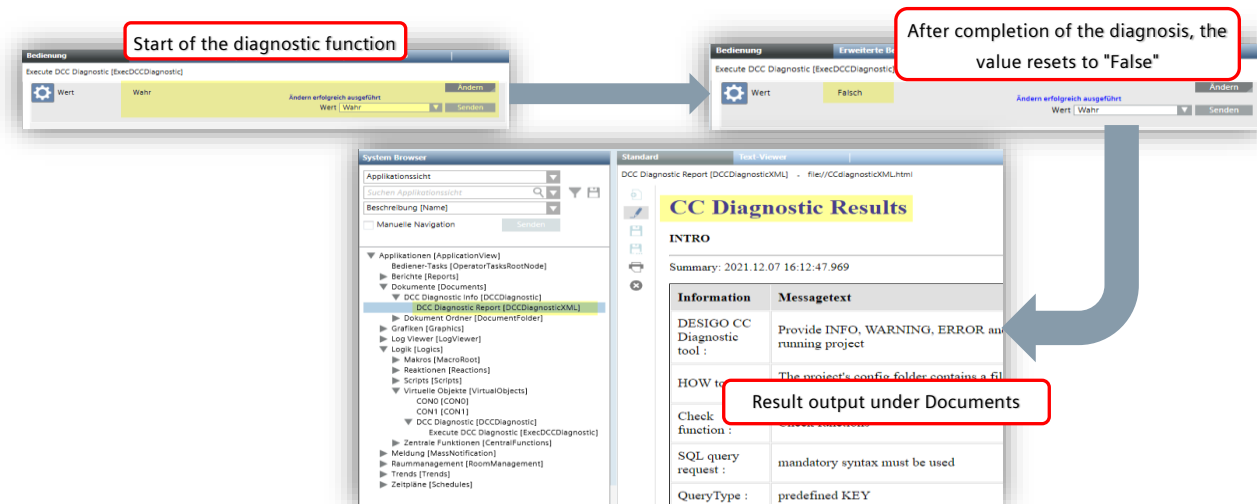


Both objects added to the project are also removed when the EM is removed!

3. Start and execution of the diagnostic function

3.1 Start diagnostics

The diagnostic function is started by means of a virtual object (value = True) during the execution the object remains in this state only after completion of the report the point changes its value back to False. Dun, the report can be viewed in HTML format under Documents.

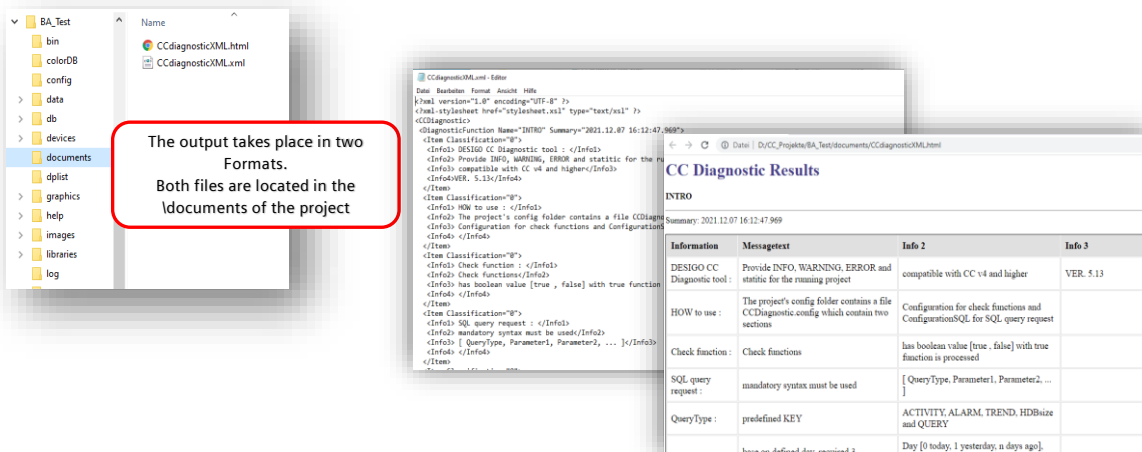


3.2 Edition

Two output formats are supported:

- CCdiagnosticXML.xml
- CCdiagnosticXML.html

The contents of both files are identical. The output directory for both files can be found in project path\documents.



The HTML format is used to display the report in the Desigo CC Client.

3.3 Ausgabe [INFO; WARNING; ERROR]

For better readability, the output is color-coded in HTML format. The information is also available in the XML document:

<Item Classification = „0“> = INFO
 <Item Classification = „1“> = WARNING
 <Item Classification = „2“> = ERROR

INFO	string in black color
WARNING	string in blue color and could be not an issue
ERROR	string in red color and check is required and correction action

```
<Item Classification="0">
  <Info1> INFO </Info1>
  <Info2> string in black color </Info2>
  <Info3> </Info3>
  <Info4> </Info4>
</Item>
<Item Classification="1">
  <Info1> WARNING </Info1>
  <Info2> string in blue color and could be not an issue </Info2>
  <Info3> </Info3>
  <Info4> </Info4>
</Item>
<Item Classification="2">
  <Info1> ERROR </Info1>
  <Info2> string in red color and check is required and correction action </Info2>
  <Info3> </Info3>
  <Info4> </Info4>
</Item>
```

4. Configuration

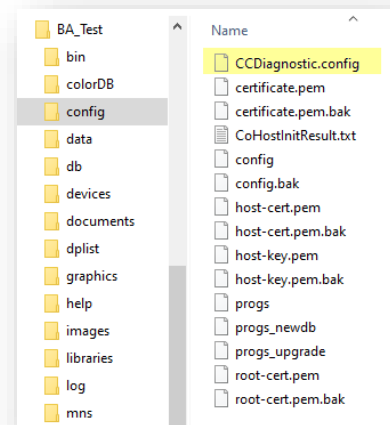
4.1 Configuration file

After the first start, the configuration file is available in the .\config folder, it can be deleted and is generated again with the default values when restarted. This step is also recommended for a version update. The configuration file is not automatically extended!

Each executed check can be switched on/off, the duration of the execution can thus be reduced to the necessary checks.

All SQL queries can be customized and extended

The configuration file is an XML file and can be edited with a text editor



4.2 Configuration Section <Configuration>

```
1 <?xml version="1.0" encoding="UTF-8" ?>
2 <CCDiagnostic>
3   <Configuration>
4     <ToolIntro enabled="true"/>
5     <CheckMpsMandatoryRms enabled="true"/>
6     <CheckSystemName enabled="true"/>
7     <CheckClientProfilesExist enabled="true"/>
8     <CheckSecurityGroups enabled="true"/>
9     <CheckGroupAppRights enabled="true"/>
10    <CheckEventSchema enabled="true"/>
11    <CheckDrivers enabled="true"/>
12    <CheckAlarmTable enabled="true"/>
13    <CheckScopeEntries enabled="true"/>
14    <CheckViewsConfig enabled="true"/>
15    <CheckWinCCOnOnlineBackup enabled="true"/>
16    <CheckAllCnsNodes enabled="true"/>
17    <CheckTamperedScripts enabled="true"/>
18    <CheckSumStaAlmSup enabled="true"/>
19    <CheckUsedTextsUnusedTexts enabled="true"/>
20    <CheckTextGroupNames enabled="true"/>
21    <CheckRelatedItemsDpIds enabled="true"/>
22    <CheckFunctionReplicates enabled="true"/>
23    <CheckWrongTLO enabled="true"/>
24    <ListTLO enabled="false"/>
25    <CheckOverrideProtection enabled="true"/>
26    <ListOverrideProtection enabled="false"/>
27    <CheckOwnership enabled="true"/>
28    <CheckDynamicLink enabled="true"/>
29    <CheckTriggerReferences enabled="true"/>
30    <HTMLOut enabled="true"/>
31  </Configuration>
```

Each check can be released using the adjacent attribute:

<ToolIntro enabled="true"/>

Turns the intro ON

<ToolIntro enabled="false"/>

Turns the intro OFF

The name of the checks was also used in the document (as far as possible):

ToolIntro

INTRO	
Summary: 2021.12.07 16:12:47.969	
Information	MessageText
DESIGO CC Diagnostic tool :	Provide INFO, WARNING, ERROR and statistic for the running project
Project :	The project's config folder contains a file

CheckEventSchema

EVENT SCHEMA	
Summary: 2021.12.07 16:12:50.475	
Information	MessageText
DESIGO CC Event Schema:	DE

With the entry **<HTMLOut enabled="false"/>** the output can be switched off as an HTML file, then only the XML file is generated

4.3 Configuration Section <ConfigurationSQL>

```
32 <ConfigurationSQL>
33   <SQLQuery1 enabled="true">
34     <Value>[ACTIVITY,0,100,10]</Value>
35   </SQLQuery1>
36   <SQLQuery2 enabled="true">
37     <Value>[ALARM,0,100]</Value>
38   </SQLQuery2>
39   <SQLQuery3 enabled="true">
40     <Value>[TREND,7,10]</Value>
41   </SQLQuery3>
42   <SQLQuery4 enabled="true">
43     <Value>[HDBsize,%HDB%]</Value>
44   </SQLQuery4>
45   <SQLQuery5 enabled="true">
46     <Value>[HDBsize,%HDB%]</Value>
47   </SQLQuery5>
48   <SQLQuery6 enabled="true">
49     <Value>[QUERY,SELECT Count(*) FROM HDB_DpIds]</Value>
50   </SQLQuery6>
51   <SQLQuery7 enabled="false">
52     <Value></Value>
53   </SQLQuery7>
54   <SQLQuery8 enabled="false">
55     <Value></Value>
56   </SQLQuery8>
57   <SQLQuery9 enabled="false">
58     <Value></Value>
59   </SQLQuery9>
60   <SQLQuery10 enabled="false">
61     <Value></Value>
62   </SQLQuery10>
63 </ConfigurationSQL>
```

Each check can be approved using the adjacent attribute:

<SQLQuery1 enabled="true"/>

Turns the query ON

<SQLQuery1 enabled="false"/>

Turns the QUERY OFF

The value Value can be used to specify the query, 4 queries are prepared (ACTIVITY; ALARM; TREND; HDBsize)

A 5th free query can be initiated using QUERY.

In total, up to 10 queries can be executed against the database. **<SQLQuery1... - <SQLQuery10...>**

4.4 Configuration SQLQuery ACTIVITY

```
<SQLQuery1 enabled="true">
  <Value>[ACTIVITY,0,100,10]</Value>
</SQLQuery1>
```

The ACTIVITY query queries the activity log of the LTS/STS. Here the objects are listed which have the most entries in the specified time range.

Adjustable values via the parameters of the Query ACTIVITY:

Objects with the most occurrences [0..n]

0 = All; n = number of results (most common first)

Min Number [0, 1..n]

0 = All points, 1..n only objects with more than n Activities

Days evaluated [0,1,n]

0 = today, 1 yesterday, n days back

Example:

[ACTIVITY,7,100,10]

7 days back, from 100 activities, the 10 highest incidents

Example:

[ACTIVITY,0,0,10]

Evaluated days 0 = today, All points, the 10 highest occurrences

Result:

Information	MessageText	Info 2
SQL Query number 1	is enabled	
SQL Query number 1	ACTIVITY	Parameters: 0 0 10
SQL Query number 1	HeaderInfo	Technical Description;Property;Activity count since 2021-12-07;Average count per day;
Result query 1	row: 1	System1.LogicalView.Logical.BACnetNetwork.HPIt.SimBV1;Aktueller Wert;3;1;
Result query 1	row: 2	System1.ManagementView.ManagementView.SystemSettings.OrganizationModes.OperationalStatus;3;1;

Average entries/day

Entries entire time range

Datenpunktadresse

4.5 Configuration SQLQuery ALARM

```
<SQLQuery2 enabled="true">
  <Value>[ALARM,0,100]</Value>
</SQLQuery2>
```

The Query Alarm queries the ALARM log of the LTS/STS. Here the objects are listed that have an alarm in the specified time range. The frequency/day of the alarms is also displayed over the selected time range

Adjustable values via the parameters of the query ALARM

Objects with the most occurrences [0..n]
0 = All; n = number of results (most common first)

Evaluated time range [0,1,n]
0 = current month, 1 last month, n months back

Example:

[ALARM,0,100] Alarms in the current month, max, 100 objects

[illegible]

Datenpunktadresse

Entries entire time range

Frequency / Day 1 -31

4.6 Configuration SQLQuery TREND

```
<SQLQuery3 enabled="true">
  <Value>[TREND,7,10]</Value>
</SQLQuery3>
```

The Trend query queries the trend log of the LTS/STS. Here the objects are listed which have the most number of samples on the specified day. In addition, the memory used and the calculated storage requirement are output to 31 days

Adjustable values via the parameters of the query TREND

Objects with the most occurrences [0..n]
0 = All; n = number of results (most common first)

Time range back [0,1,n]
0 = today, 1 yesterday, n days back

Example:
[TREND,7,10] Trendproblem/DP 7 days ago, max, 10 objects (most first)
[TREND,7,100] Trendproblem/DP 7 days ago, max, 100 objects (most first)

SQL Query number 3	is enabled	
SQL Query number 3	TREND	Parameters: 7 100
SQL Query number 3	HeaderInfo	Technical Description,N of Samples on 2021-12-01,MB used,MB forecast 31 days;
Result query 3	row: 1	Total;180937;10.07168847;312.22234257;
Result query 3	row: 2	System1.LogicalView:Logical.BACnetNetwork.HPit.HGrp2.MxCrt.TFICtr;18704;1.04114062;32.27535922;
Result query 3	row: 3	System1.LogicalView:Logical.BACnetNetwork.HPit.HGrp1.MxCrt.TFICtr;17709;0.98575488;30.55840128;
Result query 3	row: 4	System1.LogicalView:Logical.BACnetNetwork.HPit.HGrp1.MxCrt.TFI;14596;0.81247265;25.18665215;

Result line 1:
Total samples;
Total memory;
Calculated storage

Datapoint address
Total entries
Used memory
Calculated storage for 31 days

4.7 Configuration SQLQuery HDBsize

```
<SQLQuery4 enabled="true">
  <Value>[HDBsize,%HDB%]</Value>
</SQLQuery4>
```

The query HDBsize queries all databases in the SQLServer that have the % name in the database name. Memory size and free memory are output

Adjustable values via the parameters of the query HDBsize

%Name% part of the database name being searched for

Example:
[HDBsize,%HDB%]
All databases (incl. slices) which have HDB in the name are output e.g.:
HDB_Test
HDB_Test_S001_0001
HDB_Test_S001_0002
HDB_Test_S001_0003

SQL Query number 4	is enabled	
SQL Query number 4	HDBsize	Parameters:;%HDB%
SQL Query number 4	HeaderInfo	DB Name,Size in MB,Free Space in MB;
Result query 4	row: 1	HDB;2048;1960.81;
Result query 4	row: 2	HDB_S001_000042;1024;1009;
Result query 4	row: 3	HDB_S001_000043;1024;1020.44;

HDB; Size 2048MB; Free 1980.81MB
HDBS0001_00042; Size 1024MB; Frei 1009MB (Slice 42)
HDBS0001_00043; Size 1024MB; Frei 1020,44MB (Slice 43)

Query 5 is intended for NDB

4.8 Configuration SQLQuery QUERY

```
<SQLQuery6 enabled="true">
  <Value>[QUERY,SELECT Count(*) FROM HDB_DpIdsTs]</Value>
</SQLQuery6>
```

With Query a free query can be placed on the HDB database the result is returned

Adjustable values via the parameters of the query are freely configurable

Example: [QUERY, SELECT Count(*) FROM HDB_DpIdsTs] Number of trend series in hdB

SQL Query number 6	is enabled	
SQL Query number 6	QUERY	Parameters: SELECT Count(*) FROM HDB_DpIdsTs
SQL Query number 6	HeaderInfo	;
Result query 6	row: 1	155;

Return of query 155 trend series

5. Fixing Scripts

Scripts are already available for troubleshooting various errors. the name of the script is indicated in the error message

RELATED ITEMS			
Summary: 2022.08.22 14:49:02.702			
Information	Message text	Info 2	Info 3
Bad Related Item User Link in	System1:GMS_Aggregator_27_RelatedItems.UserLinks	Row:2	(Type: 1714 Sys: 1 Dp: 864891 El: 0 : ..)
Total Bad RelatedItems are:	1	Available script Fix_CleanRelatedItems	

GMSProjects > GMSMainProject > AddSW > DCCdiagnostic >	
Name	Änderungsdatum
Fix_CleanOrphanedAggregators	02.08.2022 14:33
Fix_CleanOrphanedTrigger	02.08.2022 14:33
Fix_CleanRelatedItems	02.08.2022 14:33
Fix_CleanUnresolvableCNSnodes	22.08.2022 13:52
Fix_CleanWrongTLO	02.08.2022 14:33
Fix_ResetMode	02.08.2022 14:33

The scripts can be found in the GMSMainProject under AddSW\DCCdiagnostic under the specified name

Name	Änderungsdatum	Typ	Größe
CleanRelatedItem.ctc	12.08.2022 08:27	CTC-Datei	3 KB
Fix_CleanRelatedItem.bat	02.08.2022 14:13	Windows-Batchdatei	1 KB

```
Wccoactrl68 - PROJ BA_Test
*****
C:\GMSProjects\GMSMainProject\AddSW\DCCdiagnostic\Fix_CleanRelatedItems\CleanRelatedItem.ctc
Execute script
*****
script finished
*****
Drücken Sie eine beliebige Taste . . .
```

Running the cmd file will try to fix the error.

CC_Projekte > BA_Test > log				
	log durchsuchen			
Name	Änderungsdatum	Typ	Größe	
Wccoactrl68.log	22.08.2022 15:01	Textdokument	1 KB	

```
Wccoactrl68.log - Editor
Datei Bearbeiten Format Ansicht Hilfe
2022.08.22 14:57:09.588["Usr Row"][2]
2022.08.22 14:57:09.588["Usr Clean Rows"][dyn_string 1 items
1: "System1:ApplicationView_Logics_VirtualObjects_DCCdiagnostic_ExecDCCdiagnostic"
]
```

Information about the result can be viewed under the project directory LOG in the file Wccoactrl68.log

6. Description of the tests

Under Configuration are the names that release the checks by means of a configuration file.
Under Heading are the names that are used in the result file as headings for the result.

Configuration	Heading	Description	Notes/Update
ToolIntro	INTRO	Version and description of the configuration	
	DESIGO CC VERSION	Information of the installed versions (not deselectable)	Check multi WinCC versions New in V6
	CC SERVER SYSTEM INFORMATION	System and operating system information (not deselectable)	Additional information about "Branch Cache" TLS1.3 New in V6
	SQL INFO	About SQL Server (non-deselectable)	
CheckMp5MandatoryEMs	MANDATORY EMs	Check whether all necessary EMs are available (from V5.0)	
CheckEMs	PROJECT EMs	List of EMs installed in the project	
CheckCertificate	CERTIFICATE	Check certificate usage and validity	
CheckSystemName	SYSTEM NAME	Check if the system name in Platform and Desigo CC is identical	
CheckUserSettings	USER SETTING	Check current user settings	New in V6
CheckClientProfilesExist	CLIENT PROFILE	Verify the assignment and presence of the client profile	
CheckSecurityGroups	SECURITY GROUP	Checking security groups for incorrect entries	
CheckGroupAppRights	APPLICATION RIGHT	Review of the application rights assignment to the user groups	
CheckEventSchema	EVENT SCHEMA	Event Schema Review	
CheckDrivers	COMMUNICATION DRIVER	Checking drivers for incorrect configuration	
CheckAlarmTable	DEVICE ALARM TABLE	Checking the alarm tables Entries for deviation and Incorrect entries	
CheckScopeEntries	USER SCOPE	Check SCOPE entries for errors	
CheckViewsConfig	CHECK DEFAULT VIEW	View Review	
CheckWinCCOaOnlineBackup	WinCC OnLineBackup	Checking the settings for the online backup	
CheckAllCnsNodes	NODEs in ALL VIEWS	Checking the entries in the tree structure for errors	
CheckTamperedScripts	SCRIPT FILE SIGNED	Checking the signature of the scripts	
CheckSumStaAlmSup	SUMMARY STATUS and ALARM SUPPRESSION	Checking the summary status and alarm suppression whether it exists and is in the correct position in the object models	
CheckUsedTextsUnusedTexts	TEXT GROUP NOT DEFINED	Checking for undefined text groups	
CheckTextGroupNames	TEXT GROUP DUPLICATED	Check for duplicate text groups	
CheckRelatedItemsDplds	RELATED ITEMS	Verification of the entries of the links	
CheckFunctionReplicates	FUNCTION REPLICATED	Check for duplicate functions	
CheckGraphicsReferences	GRAPHIC REFERENCE	Check Object Reference and Target	New in V6
CheckGraphicsForSvg	FLEX GRAPHIC SVG	Check the existing SVG files and Version	New in V6
CheckFlagVL_AL	FLAG VL AL	Check and count VL and AL attributes. Check gilters and activity groups for consistency	New in V6
CheckWrongTLO	WRONG TREND ONLINE	Checking for faulty online TrendLog objects (Management Station Trends)	
ListTLO	LIST TREND ONLINE	List of online TrendLog objects	
CheckOverrideProtection	EXISTING OVERRIDE PROTECTION	Check overwrite protection for normal function	

Configuration	Heading	Description	Notes/Update
ListOverrideProtection	LIST OVERRIDE PROTECTION	List of points with override protection	
CheckOwnership	OWNERSHIP	Verification of the ownership function (not relevant for DE)	
CheckDynamicLink	DYNAMIC LINK	Check if dynamic links are enabled	
CheckTriggerReferences	CHECK REFERENCES AND TRIGGERS	Checking for faulty triggers and references	
HTMLOut		Turn off output as HTML file	

Table 1 Diagnostic functions