

SKF @ptitude Analyst / OPC Client v2.0 Guide

The following document encapsulates the details and configuration procedures regarding the @ptitude Analyst / OPC transfer service version 2.0.

Version 2.0 of the @A/OPC Service utilizes the @A SDK to connect to the @ptitude Analyst database and uses the 4.0 Dot Net library to connect via Universal Access to OPC Services.

The Service will require the SDK (v1.2017.0208.00) as well as a properly configured skfDbConnections.config file. @A / OPC links are created in a stand alone CSV file.

The files are installed into the @A v9 MR2 program directory. Typically this is C:\Program Files (x86)\SKF-RS\SKF @ptitude Analyst

Existing @A / OPC links (created with @A / OPC Client v1.x) can be copied out of the access database and placed in a CSV file using Excel:

- Locate and open the MAopcManager.mdb file using Microsoft Access
 - Typically in *C:\Program Files (x86)\SKFMAOPCMGR\Database*
- Locate the MAOPCDATAMAPPING table
- Highlight the table with a <Control>A and then copy to the clipboard using <Control>C.
- Open up a blank Excel spreadsheet and then paste the links in the clipboard by using <Control>V.
- Save As CSV to an agreed upon directory on the target computer.

To register the service, use the provided InstallUtil.exe with the command line:
InstallUtil skfOPCService.exe

For testing purposes a copy of the UA Dot Net SDK should to be installed.

See the configuration appendix for the format of the skfOPCService.exe.config file. These values are editable through the Manager using the [Settings] key.

Logging Levels and Event Log Messages:

Level 0 (always)

Type	Event	Example
Warning	Link @A POINT not found in database	POINT WITH ID ##### can no longer be found in the @A database. It will be removed from scanning.
Error	@A DB connection failed	@ptitude Analyst database connection failed.
Error	Failure to read configuration file.	"Error reading application configuration file." followed by system generated catch exception.
Error	Error reading from MDB database while generating list of POINTs	"Get_List_Of_Points exception." followed by system generated catch exception.
Error	Error reading from MDB database while generating list of Servers.	"Get_List_Of_Servers exception." followed by system generated catch exception.
Error	Error writing to MDB file while updating timestamp for transferred data.	Unable to write to Access Database to update Link timestamp.
Error	Failure to create memory for DataMeasurement when storing @A data.	Failed to create memory for DataMeasurement – POINT: (#####)POINTName."
Error	Failure to save measurement in @A database	Failed to save Measurement record for POINT: (#####)POINTName.
Error	Failure to create memory for MeasReading record in while storing @A data.	Failed to create memory for MeasReading record for POINT (#####)PointName, MeasId: (#####). Deleting Measurement record.
Error	Failure to store MeasReading record in @A database.	Failed to save MeasReading record for POINT (#####)PointName, MeasId: (#####). Deleting Measurement record.
Error	Failure to load MeasReading record for last measurement for a POINT during Analyst->OPC transfer	Analyst->OPC. Failed to load (Overall Inspection MCD) MeasReading for Point: (#####)PointName, MeasId: (#####)
Info	@A DB Connection	@ptitude Analyst database connection verified.
Info	On Service Start	Service started successfully.
Info	On Service Stop	Service stopped successfully.

Level 1 (Low)

Type	Event	Example
Info	Reporting Level Setting	Reporting Level: 3
Warning	Failure to transfer data	[Analyst->OPC OPC->Analyst] [Failed to store Failed to transfer] [Overall MCD Inspection] Measurement for TIMESTAMP. LINE 2: OPC Tag info. LINE 3: @A Point Name + Values

Level 2 (Medium)

Type	Event	Example
Warning	Failed to load last measurement	Failed to load last measurement for Analyst POINT: (####)PointName.
Info	Data Transfer Success	[Analyst->OPC OPC->Analyst] [Successfully stored Successfully transferred] [Overall MCD Inspection] Measurement for TIMESTAMP LINE 2: OPC Tag info. LINE 3: @A Point Name + Values

Level 3 (High)

Type	Event	Example
Info	Debug message for each POINT in the list during Timed event	ID: (####) Is Active POINT PointName belongs to Server SERVERName.
Info	Debug Message to display on each _Timer_Elapsed event.	_timer_elapsed
Info	Debug message when @A->OPC Transfer is attempted	Analyst->OPC. Attempt to transfer data at TIMESTAMP. Line 2: OPC Link information Line 3: Analyst POINT (###)PointName.
Info	Debug message when updating MDB Link timestamp.	Update MAOPCDATAMAPPING SET DTS = timestamp WHERE MAPOINTID = pointid
Info	Debug message when update succeeds	1 row updated.

Level 4 (Full)

Type	Event	Example
Info	Debug messages when reading the contents of the application configuration file.	ACCESS CONNECT: XXXXX ACCESS DB: XXXXX
Info	Debug messages when reading the MDB database	Current Interval: ## minutes
Info	General debug messages	Get_List_Of_POINTS start. Get_List_Of_POINTS ##### points read. Get_List_Of_Servers Start. Get_List_Of_Servers ##### servers read.

Example Configuration file {skfOPCService.exe.config}:

```

1. <?xml version="1.0"?>
2. <configuration>
3.   <configSections>
4.     <section name="dataConfiguration"
       type="Microsoft.Practices.EnterpriseLibrary.Data.Configuration.DatabaseSettings, Microsoft.Practices.EnterpriseLibrary.Data, Version=3.1.0.0, Culture=neutral,
       PublicKeyToken=b03f5f7f11d50a3a" />
5.   </configSections>
6.   <dataConfiguration defaultDatabase="MS_SQL_2014" />
7.   <connectionStrings configSource="skfDbConnections.config" />
8.   <appSettings>
9.     <add key="useUA" value = "1" />
10.    <add key="OPCConnectionString" value =
       "opc.tcp://USSDGCND5342Z73:48030" />
11.    <add key="UANamespace" value =
       "http://www.unifiedautomation.com/DemoServer"/>
12.    <add key="linkDatabase" value="C:\Temp\aptAnalystOPCTagList.csv" />
13.    <add key="loggingLevel" value="4"/>
14.    <add key="TransferInterval" value="15" />
15.    <add key="transferInspectionUncheckedResults" value="1"/>
16.  </appSettings>
17. </configuration>

```

Key:

1. Standard XML version header
2. Configuration Section (2-17)
3. ConfigSection (3-5)
4. DataConfiguration (for use with DotNetSDK)
6. @A Database Configuration Title
7. Link to skfDbConnections.config file (*)
8. AppSettings Section (8-16)
9. useUA (if the service ultimately supports UA as well as DCOM DA2.0/3.0 protocols, this will allow the switching between the 2 modes (1=UA; 0=DA2.0)
10. OPCConnectionString – the connection parameters used to connect to the UA OPC Server.
11. UANamespace – the namespace within the UA OPC Server where tags are located.
12. linkDatabase – the location of the services link CSV file
13. loggingLevel – controls the number of debug events written to the Windows Event Log file
14. TransferInterval– The period (in minutes) between wakeup of the @A OPC Service thread to transfer new data.
15. transferInspectionUncheckedResults (1= sends a 0 if Inspection Result is unchecked; 0=suppresses transfer if Inspection Result is unchecked)

(*) Requires the configuration file from an @A installation.

Differences between @A OPC Client Version 1.2 and Version 2.0

1. Method of connecting to an OPC Server
 - a. Version 1.2 uses DCOM to connect to an OPC DA 2.0 or DA 3.0 Server
 - b. Version 2.0 uses OPC Universal Access (UA)
2. Method of connecting to the @ptitude Analyst (@A) database
 - a. Version 1.2 requires 2 accounts to be set up in @A – one for the MAOPCManager and one for the Service.
 - b. Version 2.0 doesn't require any accounts to be setup. It does, however, require the database configuration file (skfDBConnections.config) to be present. This file is created by the skfAnConfigTool.
3. Need for Microsoft Access
 - a. Version 1.2 stores the links and the service parameters in an Access database.
 - b. Version 2.0 stores the links in a flat CSV file and the service parameters in the service's <XML> configuration file.
4. Event Log messages
 - a. Version 1.2 stored the event log messages in an internal table and loaded these messages upon startup of the MAOPCManager. This could lead to ever increasing delays in starting the MAOPCManager if logging was left on. There was only one level of messaging.
 - b. Version 2.0 stores the event log messages in the Windows Event Log (accessible through Control Panel). This results in a more consistent performance in opening up the configuration utility. There are 4 levels of messaging available.
5. Robustness when connection to the @A database or OPC Server is lost.
 - a. Version 1.2 had occasional issues of 'locking up' when connection to the OPC Server was lost.
 - b. Version 2.0 constantly tests the connection to the @A database as well as the OPC Server and automatically reconnects when connection is reestablished.
6. Age of tool set
 - a. Version 1.2 was built over 10 years ago, using 15-year OPC protocols (DCOM)
 - b. Version 2.0 is built with current Dot Net libraries to both connect to the @A database and to the OPC Server using OPC's latest protocols (UA)
7. Ability to view links in a table
 - a. Version 1.2 didn't have the ability to view what POINTs were linked to what tags except with the tree control view.
 - b. Version 2.0 has a filterable list (by name, by direction, by POINT Type) to quickly locate linked @A POINTs.