SMARTdiagnostics®

Give Your Machines a Voice

SmartDiagnostics® Application Note

OPC DA Server Version 1.4.1 Installation Instructions

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KCF Technologies, Inc.

Overview

The SmartDiagnostics OPC DA Server allows OPC DA-compliant clients to retrieve current values in near real-time from SmartDiagnostics.

Requirements

Windows 7 or later or Windows Server 2008 R2 or later

Minimum 2GB of RAM

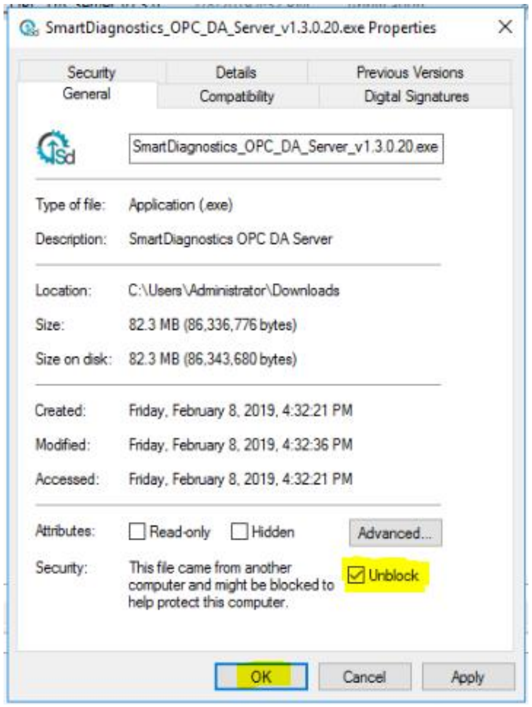
The OPC DA Server will install the following dependencies if they are not already available on the system:

- Microsoft .NET Runtime 4.6.2
- Microsoft Visual C++ 2010 and 2013 redistributables
- OPC Foundation OPC Core Components - more info

The system running the OPC DA Server must be able to communicate with the SmartDiagnostics server (cloud or on-premises, depending on your application). This may require firewall configuration changes. For cloud customers, you must permit outbound HTTPS (port 443) to sd.kcftech.com. For on-premises customers, you must permit outbound HTTP on port 52000 to your SmartDiagnostics server. Note that web filtering proxies are not supported. Contact your IT department for assistance.

Installation Procedure

Download the OPC DA Server installer here.



SmartDiagnostics_OPC_DA_Server_v1.3.0.20.exe Properties

SmartDiagnostics_OPC_DA_Server_v1.3.0.20.exe

Type of file: Application (.exe)

Description: SmartDiagnostics OPC DA Server

Location: C:\Users\Administrator\Downloads

Size: 82.3 MB (86,336,776 bytes)

Size on disk: 82.3 MB (86,343,680 bytes)

Created: Friday, February 8, 2019, 4:32:21 PM

Modified: Friday, February 8, 2019, 4:32:36 PM

Accessed: Friday, February 8, 2019, 4:32:21 PM

Attributes: □ Read-only □ Hidden

Security: This file came from another computer and might be blocked to help protect this computer. ☑ Unblock

If the installer does not run, it may be blocked by Windows SmartScreen. From the installer file properties dialog, check the “Unblock” box.

Note: *If upgrading from a previous version of the OPC DA Server, the customOPC.config settings file may be overwritten. Therefore, we recommend backing up the customOPC.config settings to maintain record of the previously configured apiKey, updateRate, and tempUnits.*

Once the installation completes, configure the service by editing this file (default installation directory assumed):

C:\Program Files\KCF Technologies\Smart Diagnostics OPC DA Server\customOPC.config

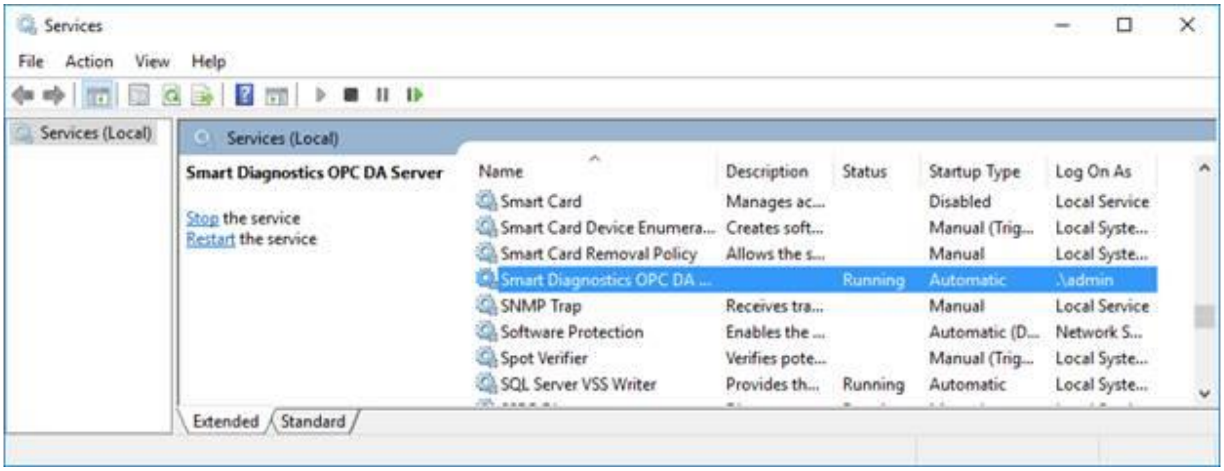
Edit the following keys:

1. Set **apiKey** to the API key that KCF support will give to you.
2. For cloud-based SmartDiagnostics installations, leave **sdUrl** as “https://sd.kcftech.com”. For on-premises applications, change **sdUrl** to “http://<server_ip>:52000” (note “http” rather than “https”).
3. Set **updateRate** to your desired rate in seconds. This determines how frequently the OPC DA Server will update its item cache from SmartDiagnostics.
4. Set **tempUnits** to “F” for Fahrenheit or “C” for Celsius.

Save the customOPC.config file.

After editing and saving the file, start the Windows service:

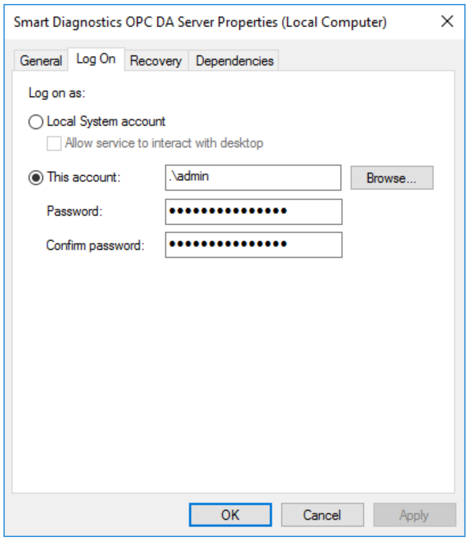
1. Open the Windows Services console (you can search for “Services” in the Start Menu).
2. Find **SmartDiagnostics OPC DA Server** in the list. Right-click and select “Start” (or “Restart” if it’s already running). Note that any future changes to the customOPC.config file will require a restart of the service to take effect.



Smart Diagnostics OPC DA Server

Stop the service
Restart the service

Name	Description	Status	Startup Type	Log On As
Smart Card	Manages ac...		Disabled	Local Service
Smart Card Device Enumera...	Creates soft...		Manual (Trig...	Local Syste...
Smart Card Removal Policy	Allows the s...		Manual	Local Syste...
Smart Diagnostics OPC DA ...		Running	Automatic	.\admin
SNMP Trap	Receives tra...		Manual	Local Service
Software Protection	Enables the ...		Automatic (D...	Network S...
Spot Verifier	Verifies pote...		Manual (Trig...	Local Syste...
SQL Server VSS Writer	Provides th...	Running	Automatic	Local Syste...



Log on as:

○ Local System account

□ Allow service to interact with desktop

● This account: .\admin

Password: •••••••••••••••

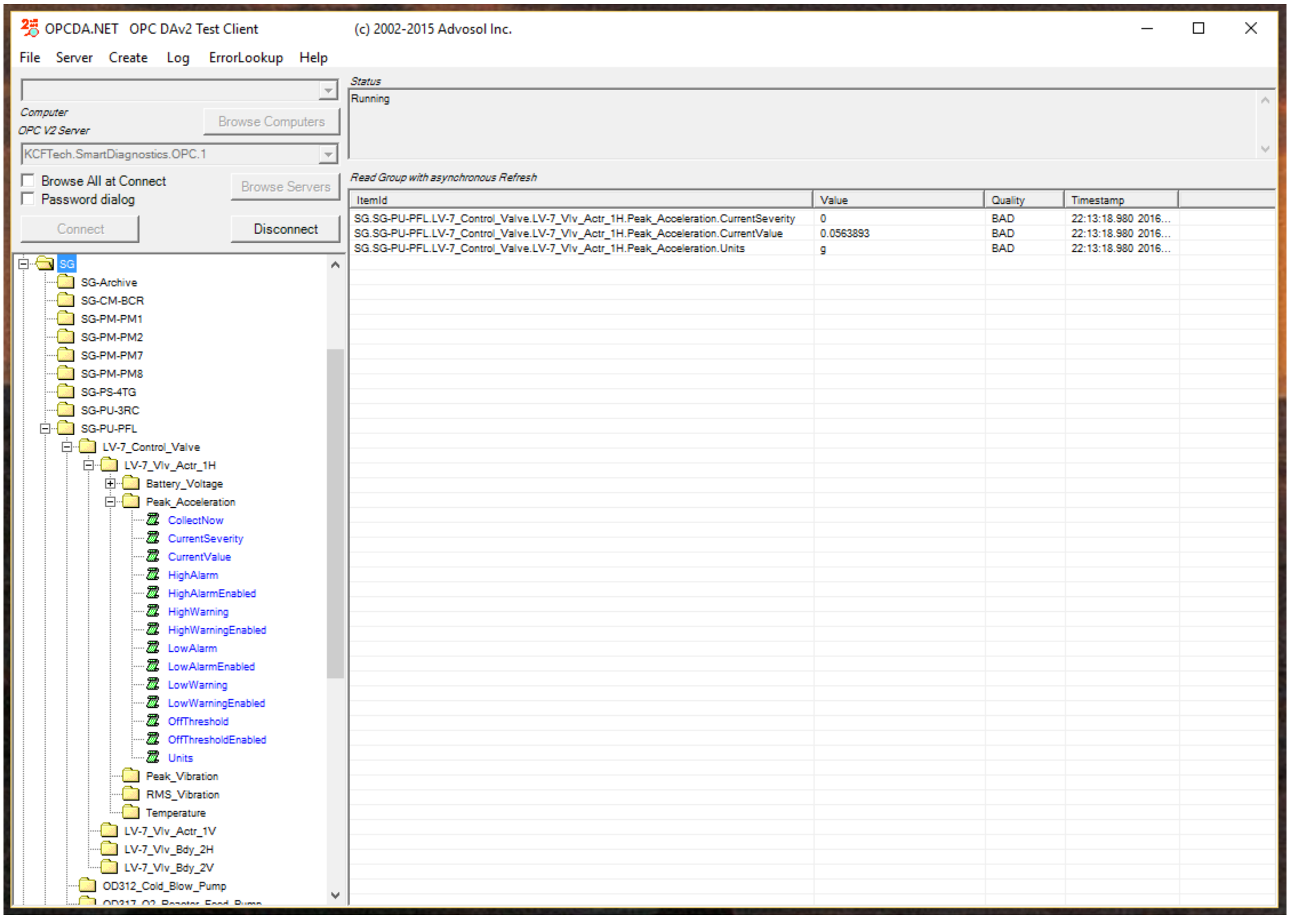
Confirm password: •••••••••••••••

Depending on your Windows version, the Local System or Local Service accounts may not have the necessary permissions to access DCOM. In this case, it may be necessary to modify the service configuration to run under a different account that is a member of the Administrators group.

Usage

Once the OPC DA Server is running, use an OPC test client to verify that it is operating successfully. Connect to the **KCFTech.SmartDiagnostics.OPC.1** server.

NOTE: There are two servers listed. Connect to **…OPC.1**, not **…OPC.** You will be able to browse an OPC structure that will reflect the structure that exists in SmartDiagnostics.



Computer

OPC V2 Server: KCFTech.SmartDiagnostics.OPC.1

☐ Browse All at Connect
☐ Password dialog

Status: Running

Read Group with asynchronous Refresh

ItemId	Value	Quality	Timestamp
SG.SG-PU-PFL.LV-7_Control_Valve.LV-7_Vlv_Actr_1H.Peak_Acceleration.CurrentSeverity	0	BAD	22:13:18.980 2016...
SG.SG-PU-PFL.LV-7_Control_Valve.LV-7_Vlv_Actr_1H.Peak_Acceleration.CurrentValue	0.0563893	BAD	22:13:18.980 2016...
SG.SG-PU-PFL.LV-7_Control_Valve.LV-7_Vlv_Actr_1H.Peak_Acceleration.Units	g	BAD	22:13:18.980 2016...

```
SG
  SG-Archive
  SG-CM-BCR
  SG-PM-PM1
  SG-PM-PM2
  SG-PM-PM7
  SG-PM-PM8
  SG-PS-4TG
  SG-PU-3RC
  SG-PU-PFL
    LV-7_Control_Valve
      LV-7_Vlv_Actr_1H
        Battery_Voltage
        Peak_Acceleration
          CollectNow
          CurrentSeverity
          CurrentValue
          HighAlarm
          HighAlarmEnabled
          HighWarning
          HighWarningEnabled
          LowAlarm
          LowAlarmEnabled
          LowWarning
          LowWarningEnabled
          OffThreshold
          OffThresholdEnabled
          Units
        Peak_Vibration
        RMS_Vibration
        Temperature
      LV-7_Vlv_Actr_1V
      LV-7_Vlv_Bdy_2H
      LV-7_Vlv_Bdy_2V
    OD312_Cold_Blow_Pump
    OD317_O2_Reactor_Feed_Pump
```

Each indicator in SmartDiagnostics will expose the following list of items:

- **CurrentValue**
- **CurrentSeverity**
- **HighAlarm**
- **HighAlarmEnabled**
- **HighWarning**
- **HighWarningEnabled**
- **LowAlarm**
- **LowAlarmEnabled**
- **LowWarning**
- **LowWarningEnabled**
- **Units**
- **IndicatorId**

Additionally, an item named **OPCStatus.SecondsOfDay** is available to monitor the status of the server's connection to SmartDiagnostics. After each successful connection to SmartDiagnostics, the item is updated with the number of seconds elapsed since midnight UTC. This can be useful to identify that the server is functioning properly even if the indicator items above are not getting updated values because of latency in SmartDiagnostics.

Writing Data to SmartDiagnostics Indicators Using OPC DA

It is possible to create writable OPC items exposed through the OPC DA Server. These items can be written to from an OPC DA client, and their values will become trend points on the corresponding indicator in SmartDiagnostics. Use the following process to create writable OPC items:

1. Create an **External Data Source (General Input)** monitoring point in SmartDiagnostics.
2. Assign the **OPC DA Server** sensor to this monitoring point.
3. Create **General Time Series** indicators on this monitoring point or on a group beneath it.

Indicators created in this way will expose a writable **CurrentValue** OPC item.

Troubleshooting

The OPC server writes status information to a log file located at C:\ProgramData\KCF Technologies\Smart Diagnostics\logs\opc\OPCLog.txt:

```
2019-02-18 21:59:24.3846 NSPlugin.AppPlugin --------------- Server starting...
2019-02-18 21:59:24.4315 NSPlugin.AppPlugin --------------- API key: ABCABCABC
2019-02-18 21:59:24.4315 NSPlugin.AppPlugin --------------- Domain: https://sd.kcftech.com
2019-02-18 21:59:24.4315 NSPlugin.AppPlugin --------------- Temp units: F
2019-02-18 21:59:24.4471 NSPlugin.AppPlugin Getting indicators from server...
2019-02-18 21:59:25.7295 NSPlugin.AppPlugin Retrieved 2632 indicators in 1.29 seconds from server.
2019-02-18 21:59:26.3715 NSPlugin.AppPlugin Added 34217 items to the server cache in 0.62 seconds.
2019-02-18 21:59:26.3715 NSPlugin.AppPlugin Server started successfully.
```

If it appears that the server cannot connect and retrieve indicators, try verifying connectivity to https://sd.kcftech.com from a web browser on the server.

If the log file indicates the OPC server is successfully retrieving values from SmartDiagnostics, but you encounter errors in an OPC test client while connecting to or browsing the OPC server, double check the user/service account that is running the “SmartDiagnostics OPC DA Server” service. Make sure that account has proper permissions to use DCOM (see the installation section).