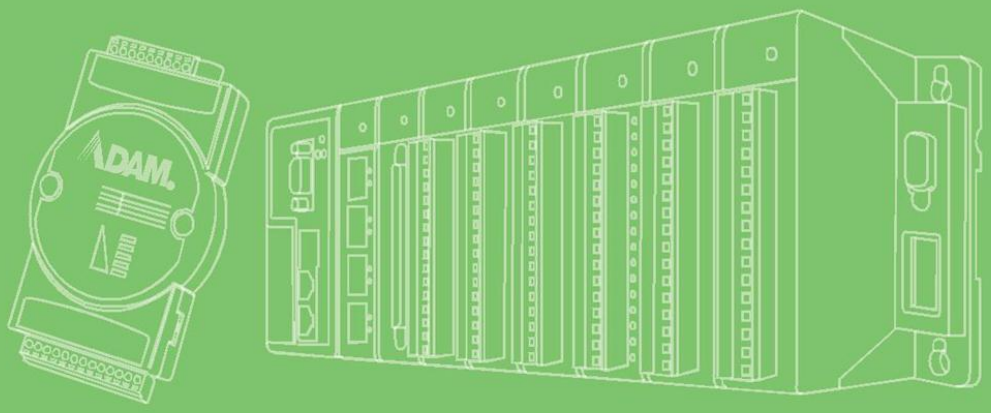


User Manual

Advantech Database Library

V1.2

CONTENTS

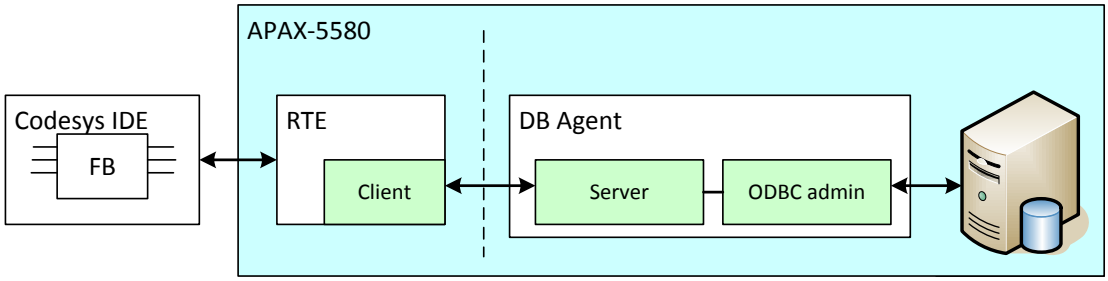
Document History:

Doc Version	Date	Author	Comment
1.0	2016/5/9	Kelly Li	First edition
1.1	2016/5/31	Kelly Li	Add Advantech add on install procedure
1.2	2016/6/29	Kelly Li	Add DB_INSERT, DB_SELECT_TABLE and DB_STRCAT function blocks Advantech Add-on: 3.5.8.3 ADV DB Library: 3.5.8.10 ADV DB Agent: 3.5.8.10

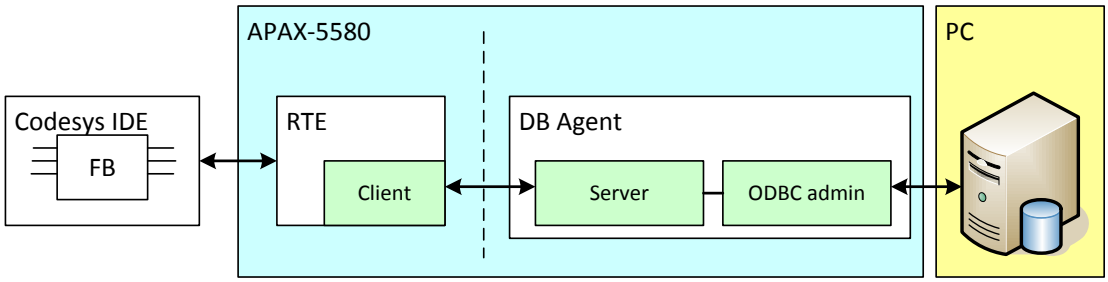
1. Overview

This document describes the Advantech database library and database agent user manual. The Database agent is installed on APAX-5580. When user uses Advantech database function blocks in the IEC program, and then download to RTE. Database agent will send the SQL command through the ODBC Administrator. There are two topologies with Advantech database agent:

Case1: Database server and Advantech database agent are installed at the same device.



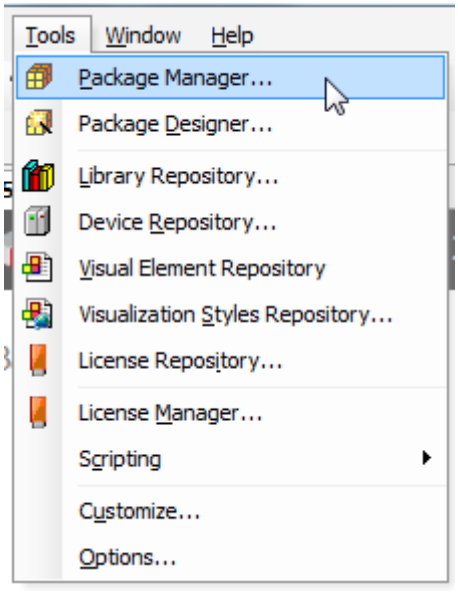
Case2: Database server and Advantech database agent are installed at different device.



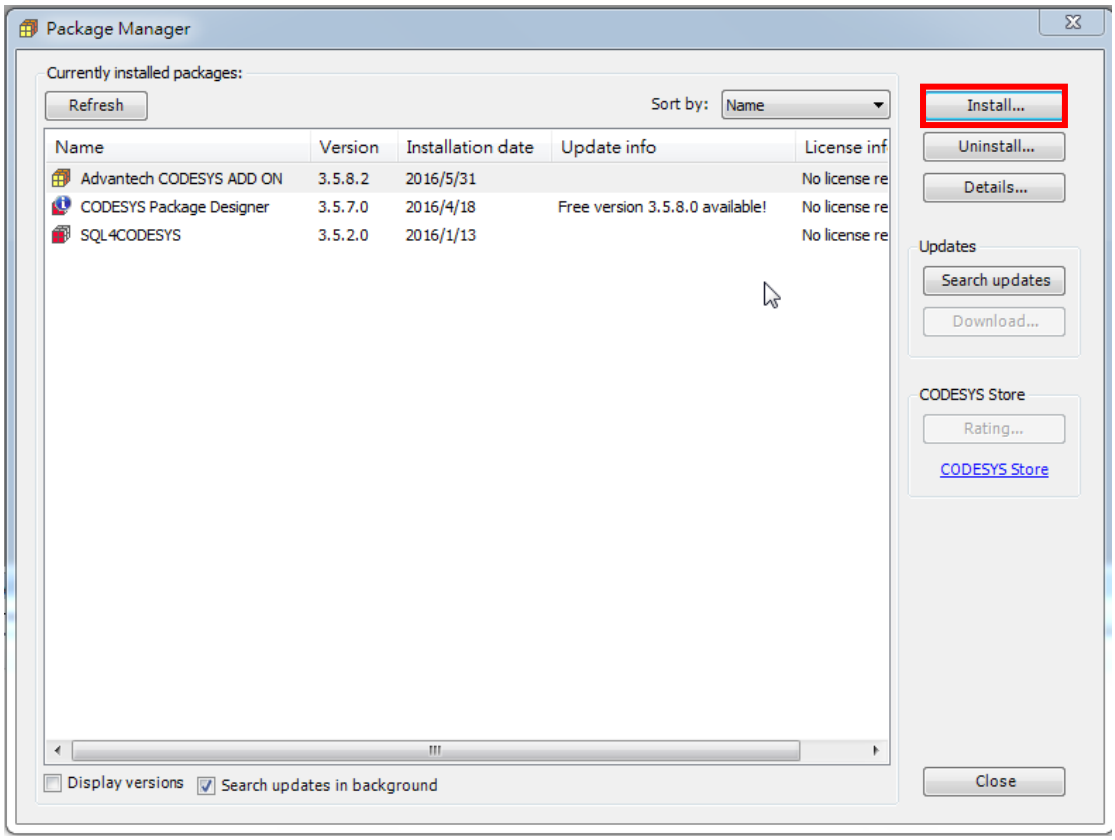
2. Install Advantech CODESYS ADD ON

Step1: Execute CODESYS IDE

Step2: Click Tools → Package Manager

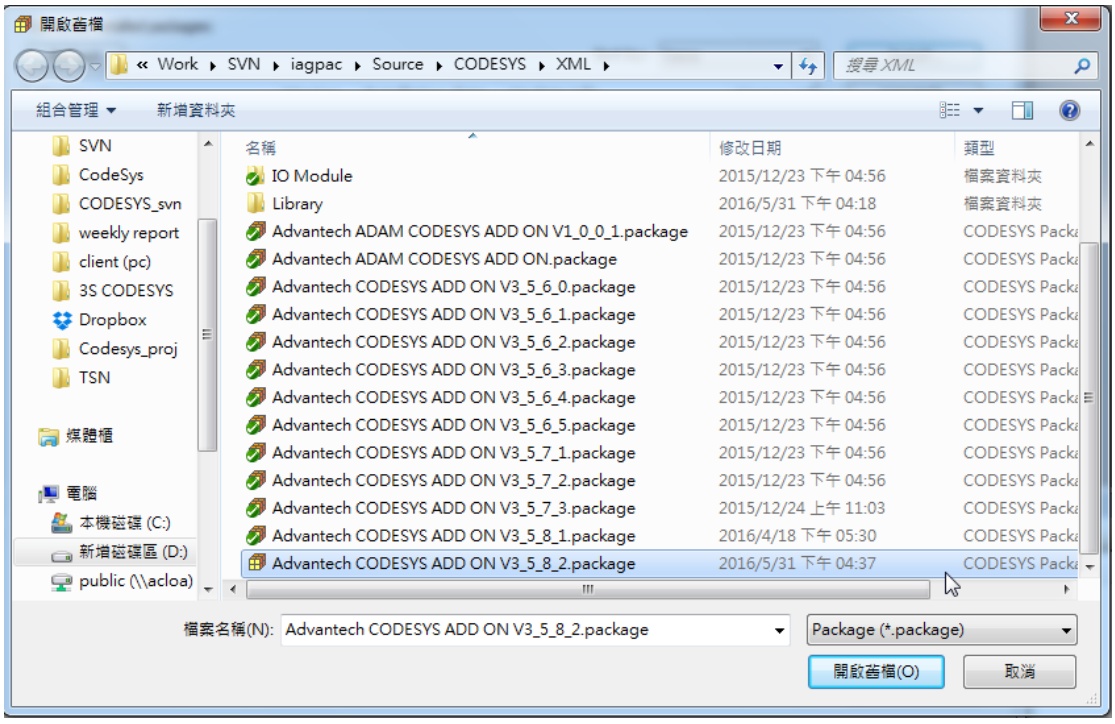


Step3: Click “Install” button

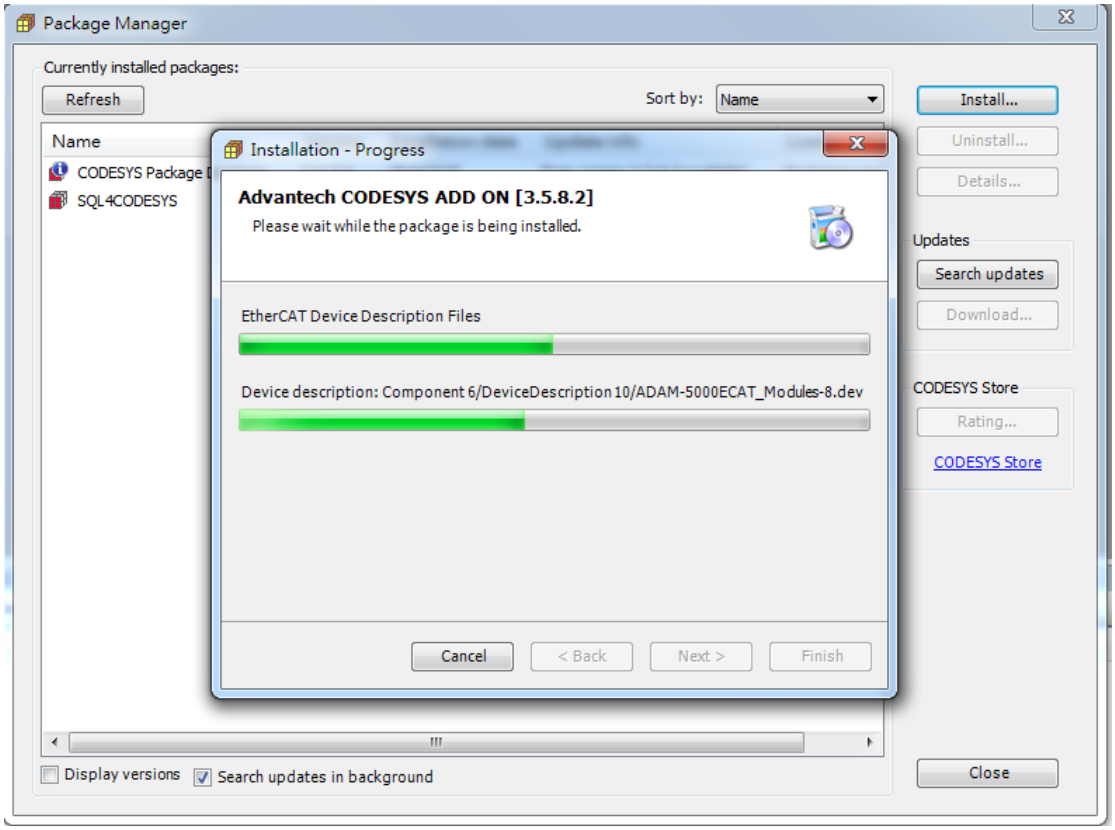


Step4: Select Advantech add on

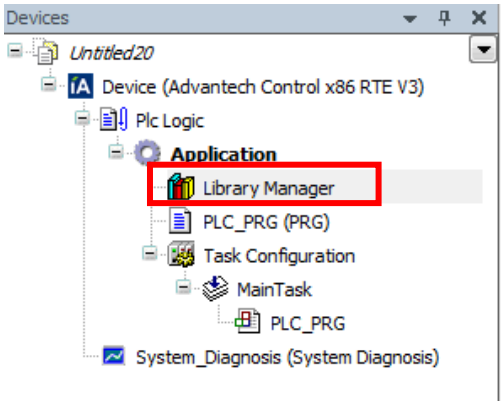
(Support version: 3.5.8.2 or later)

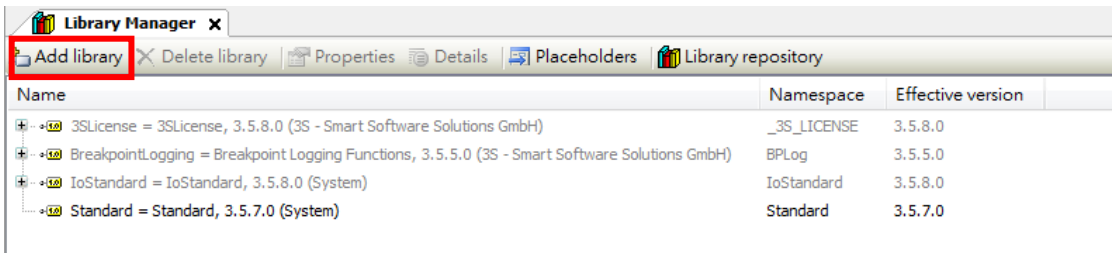


Step5: It will install Advantech CODESYS ADD ON

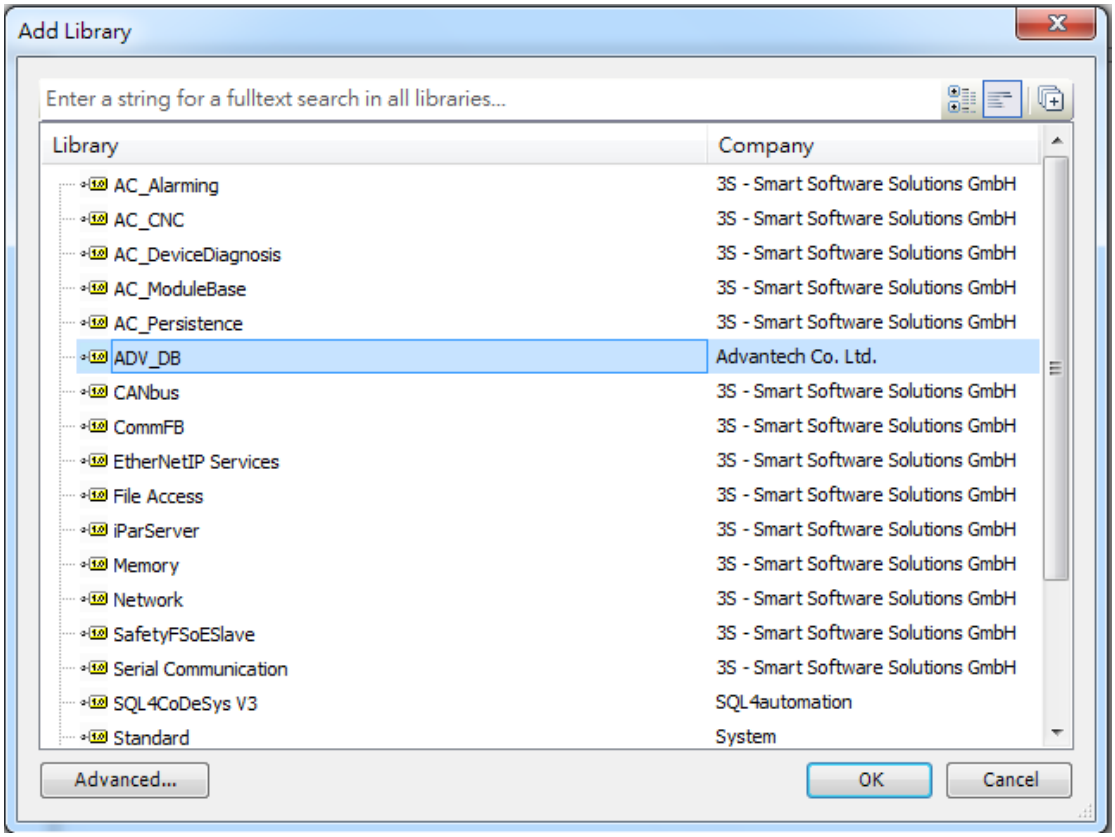


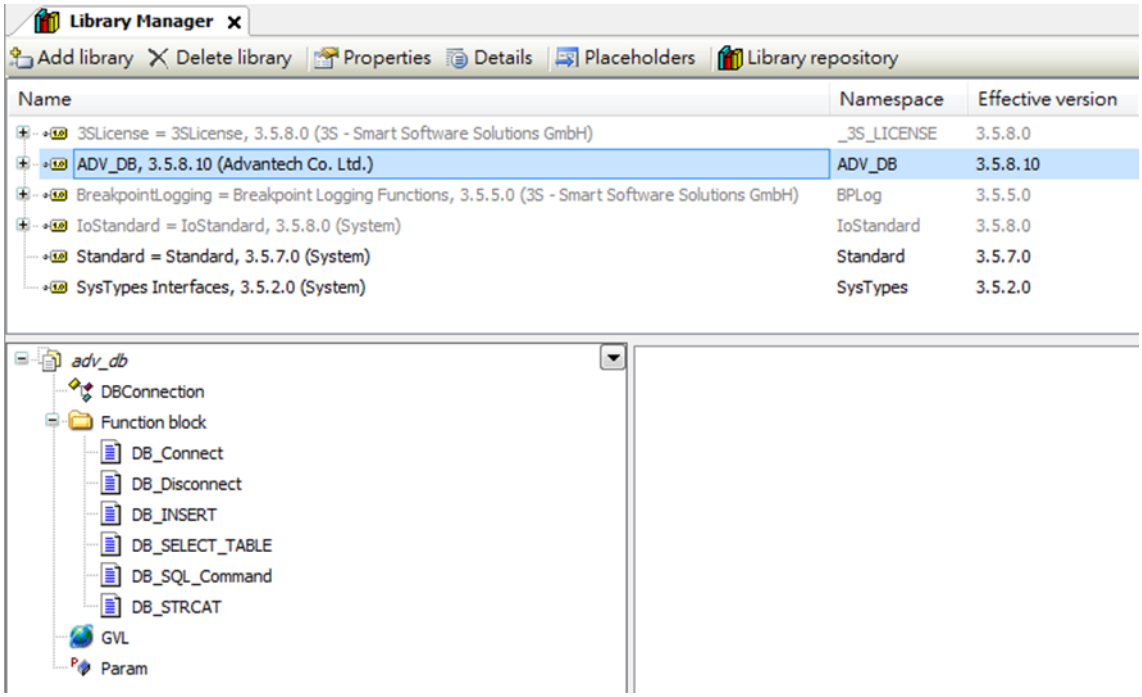
Step6: Double click “Library Manager” and then click “Add Library”





Step7: Choose “ADV_DB”. You can find function blocks and parameters of Advantech database library.





3. Struct

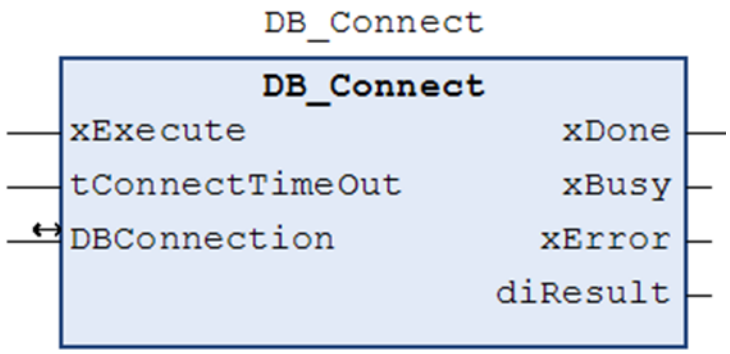
3.1. DBConnection

DBConnection structure		
Name	Data Type	Description
Socket	RTS_IEC_HANDLE	Database connection socket handle
State	BYTE	Database connection socket state

4. Function block

4.1. DB_Connect

Connect to database agent and get a database connection handle.

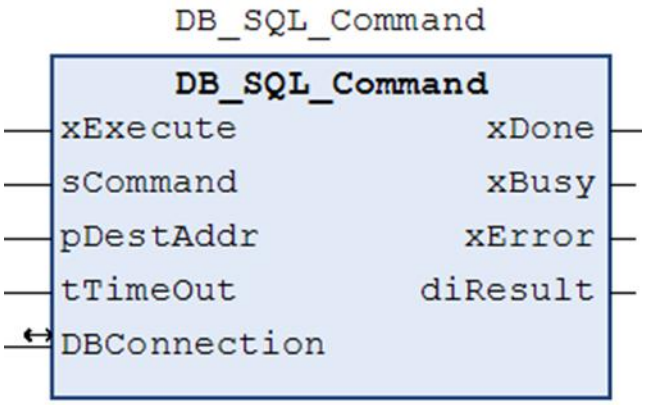


Input variable		
Name	Data Type	Description
xExecute	BOOL	Execute to establish database connection
tConnectTimeout	TIME	Connection timeout. (5s ~ 30s)
Output variable		

Name	Data Type	Description
xDone	BOOL	Create connection to database agent is done
xBusy	BOOL	The FB is not finished
xError	BOOL	Signals that an error has occurred within FB
diResult	DINT	Error identification
Input - output variable		
Name	Data Type	Description
DBConnection	DBConnection	Database connection handle

4.2. DB_SQL_Command

Used to send SQL command

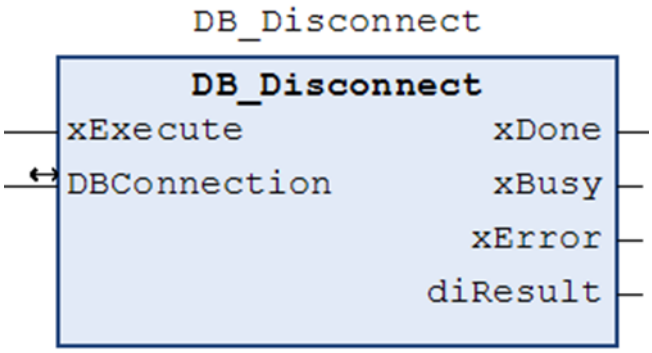


Input variable		
Name	Data Type	Description
xExecute	BOOL	Execute to send SQL request command
sCommand	STRING(Param.maxStringLen)	SQL request command string
pDestAddr	POINTER TO ARRAY[1..Param.maxRowSize, 1..Param.maxColumnSize] OF STRING(Param.maxStringLen)	Point to result table array
tTimeout	TIME	Receive timeout. (5s ~ 30s)
Output variable		
Name	Data Type	Description

xDone	BOOL	Send SQL command finish
xBusy	BOOL	The FB is not finished
xError	BOOL	Signals that an error has occurred within FB
diResult	DINT	Error identification
Input - output variable		
Name	Data Type	Description
DBConnection	DBConnection	Database connection handle

4.3. DB_Disconnect

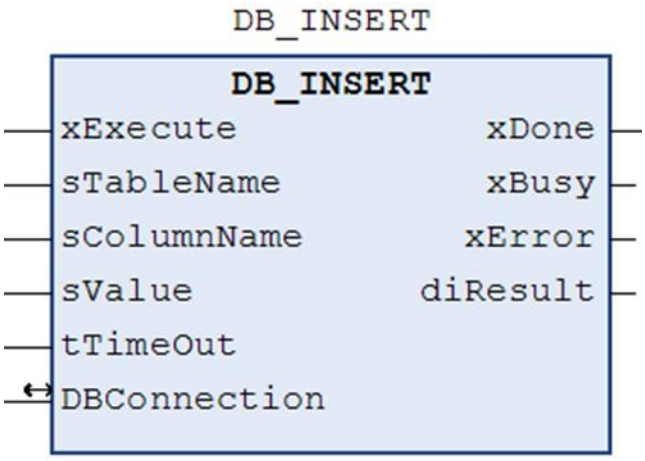
Used to close specific database connection



Input variable		
Name	Data Type	Description
xExecute	BOOL	Execute to close database connection
Output variable		
Name	Data Type	Description
xDone	BOOL	Connection is closed
xBusy	BOOL	The FB is not finished
xError	BOOL	Signals that an error has occurred within FB
diResult	DINT	Error identification
Input - output variable		
Name	Data Type	Description
DBConnection	DBConnection	Database connection handle

4.4. DB_INSERT

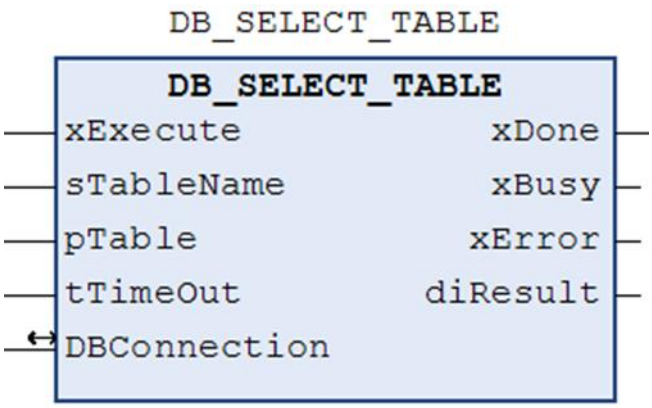
Used to insert values to a table as a record



Input variable		
Name	Data Type	Description
xExecute	BOOL	Execute to send SQL request command
sTableName	STRING(Param.maxStringLen)	The table name in the database
sColumnName	STRING(Param.maxStringLen)	The name of the column
sValue	STRING(Param.maxStringLen)	The inserted values
tTimeOut	TIME	Receive timeout. (5s ~ 30s)
Output variable		
Name	Data Type	Description
xDone	BOOL	Send SQL command finish
xBusy	BOOL	The FB is not finished
xError	BOOL	Signals that an error has occurred within FB
diResult	DINT	Error identification
Input - output variable		
Name	Data Type	Description
DBConnection	DBConnection	Database connection handle

4.5. DB_SELECT_TABLE

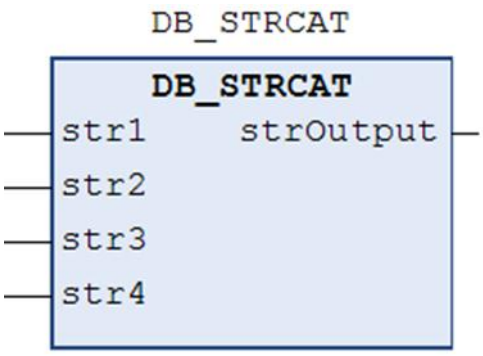
Used to retrieves records from a table to an array



Input variable		
Name	Data Type	Description
xExecute	BOOL	Execute to send SQL request command
sTableName	STRING(Param.maxStringLen)	The table name in the database
pTable	POINTER TO ARRAY[1..Param.maxRowSize, 1..Param.maxColumnSize] OF STRING(Param.maxStringLen)	Point to result table array
tTimeOut	TIME	Receive timeout. (5s ~ 30s)
Output variable		
Name	Data Type	Description
xDone	BOOL	Send SQL command finish
xBusy	BOOL	The FB is not finished
xError	BOOL	Signals that an error has occurred within FB
diResult	DINT	Error identification
Input - output variable		
Name	Data Type	Description
DBConnection	DBConnection	Database connection handle

4.6. DB_STRCAT

Concatenation of database strings (column name or value).



Input variable		
Name	Data Type	Description
str1	STRING(255)	The concatenated string
Str2	STRING(255)	The concatenated string
Str3	STRING(255)	The concatenated string
Str4	STRING(255)	The concatenated string
Output variable		
Name	Data Type	Description
strOutput	STRING(255)	The concatenated resulting string

5. Parameter

Parameter			
Name	Data Type	Initialization	Description
maxRowSize	WORD	WORD#500	The max. row size of table array
maxColumnSize	WORD	WORD#10	The max. column size of table array
maxStringLen	BYTE	BYTE#80	The max. string length
maxRequestBufferSize	WORD	WORD#8192	The max. bytes of send buffer
maxRecvBufferSize	WORD	WORD#8192	The max. bytes of receive buffer

sIPAddress	STRING(15)	'127.0.0.1'	The IP address of Advantech database agent

6. Error number

Error number of function block	
Error ID	Description
1	Success
2	Timeout
10	Request string is empty.
11	Response array is not defined.
12	Number of max column (maxColumnSize) is 0
13	Number of max row (maxRowSize) is 0
14	Invalid socket
20	Connect to database agent fail. Please check firewall setting. (create/connect socket fail)
21	Socket has been closed. No more send/receives allowed.
30	Send request to database agent fail
31	Request packet size is greater than max send buffer size(maxRequestBufferSize)
32	Response row count is greater than maxRowSize
33	Response column count is greater than maxColumnSize
34	Response packet size is greater than max receive buffer size, please increase maxRecvBufferSize
40	Connection to database agent can’t be closed.
50	Connection timeout
51	Send timeout
52	Total timeout
100	Client idle timeout
101	Send database command error
102	Send packet format error
103	Response data exceed the max buffer size

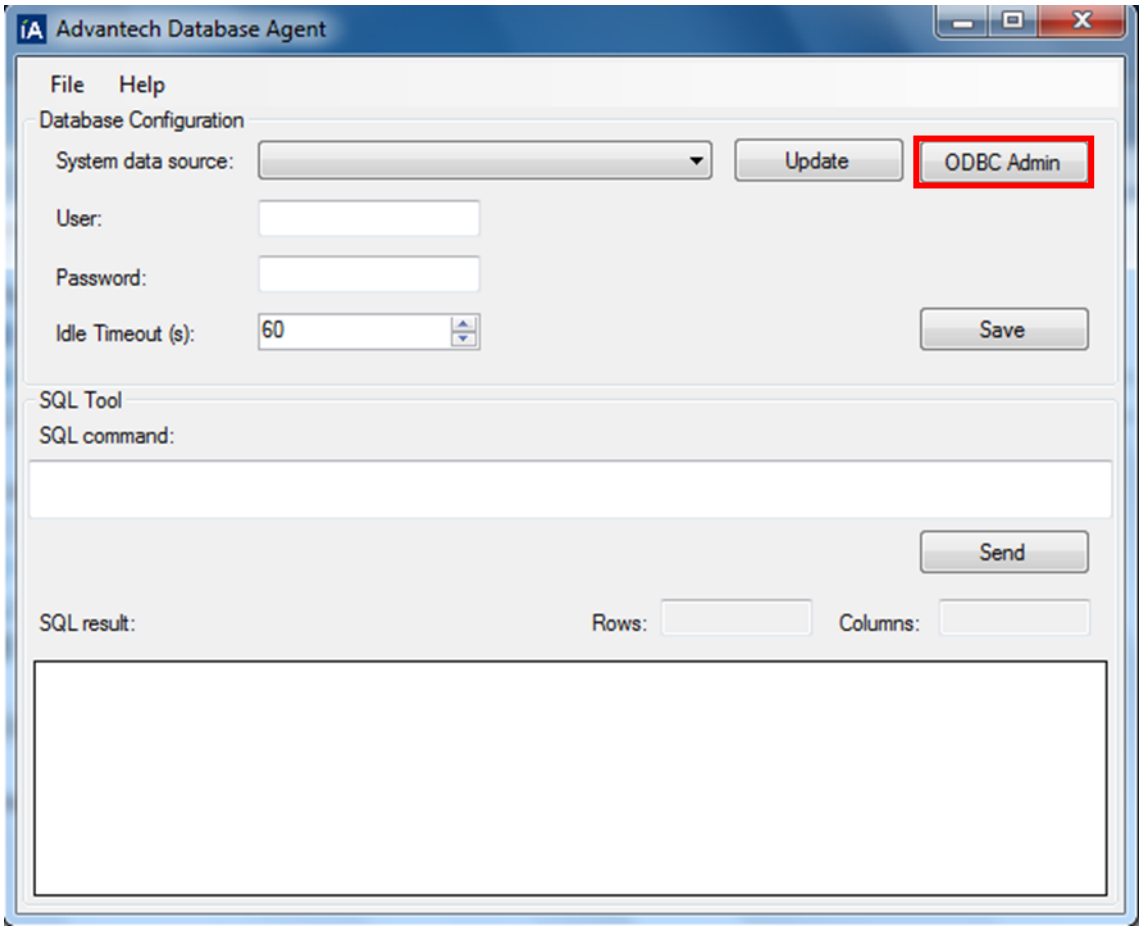
7. Agent configuration

7.1. Database configuration

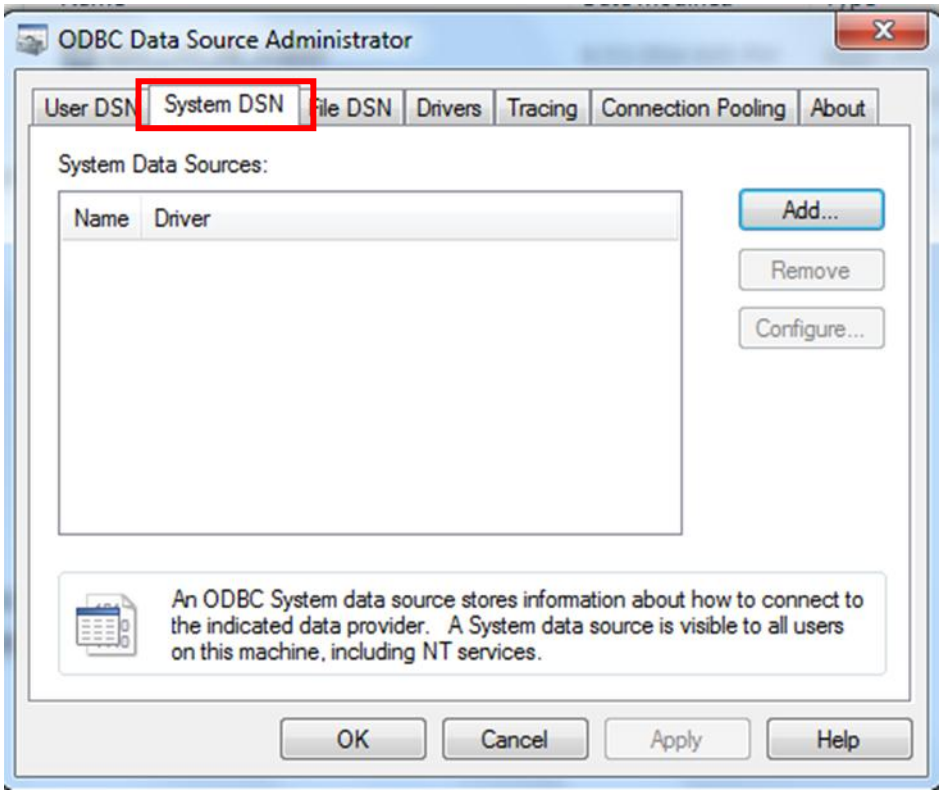
7.1.1. Create new system DSN

Note: Before you create new data source, please install ODBC driver.

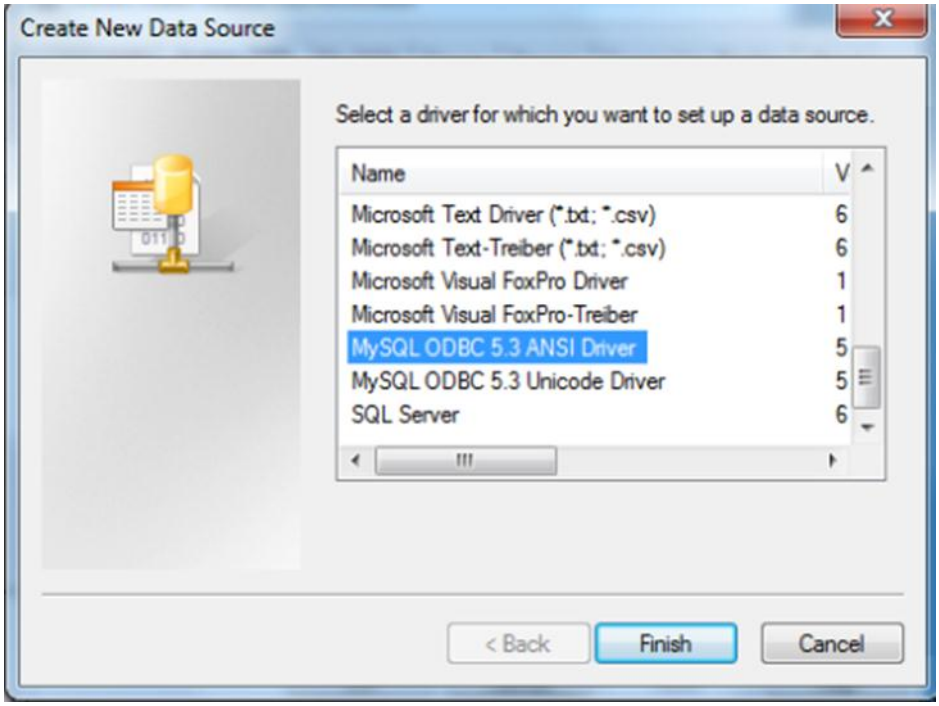
Step1: Click “ODBC Admin” button



Step2: Select System DSN

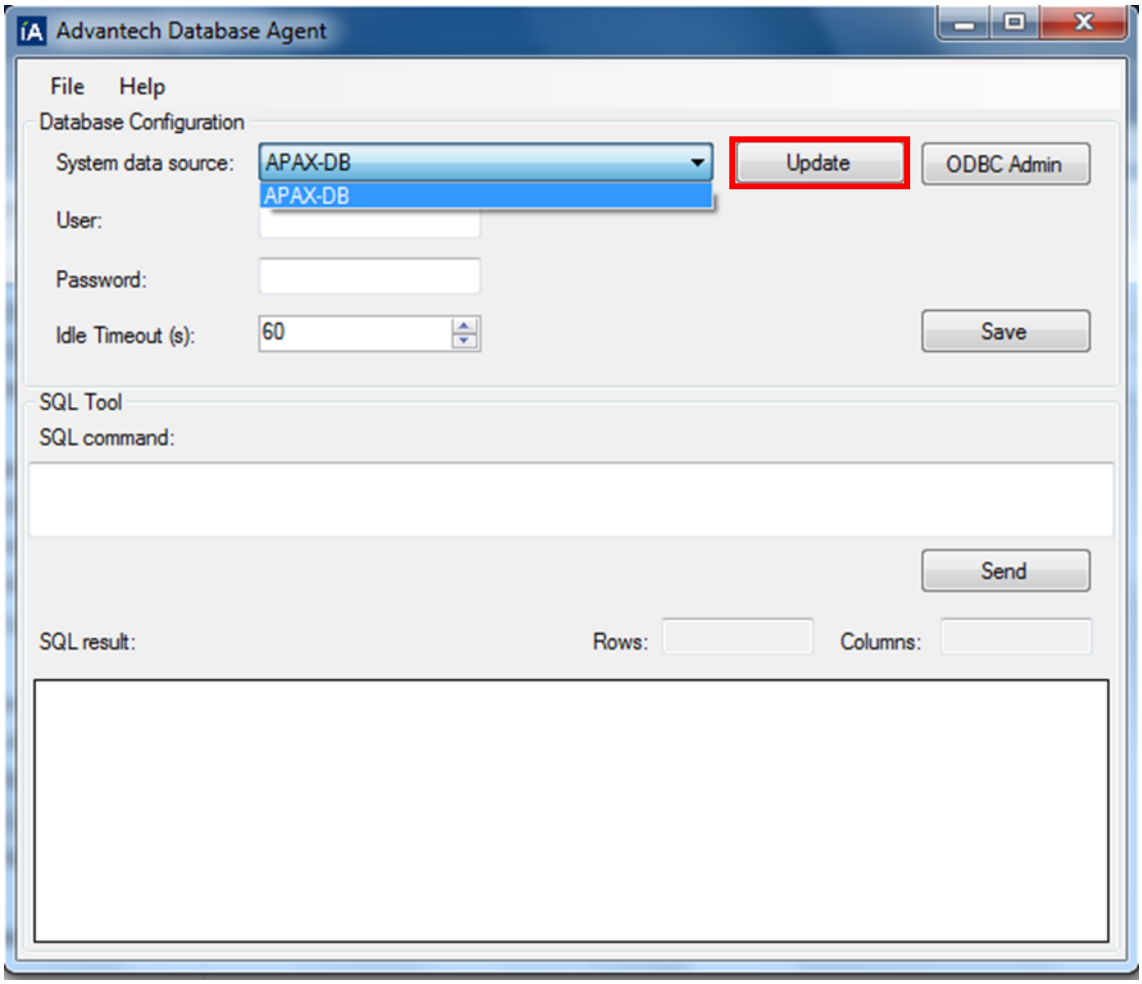


Step3: Click “Add” to create new data source. We add MySQL ODBC 5.3 ANSI Driver as example.

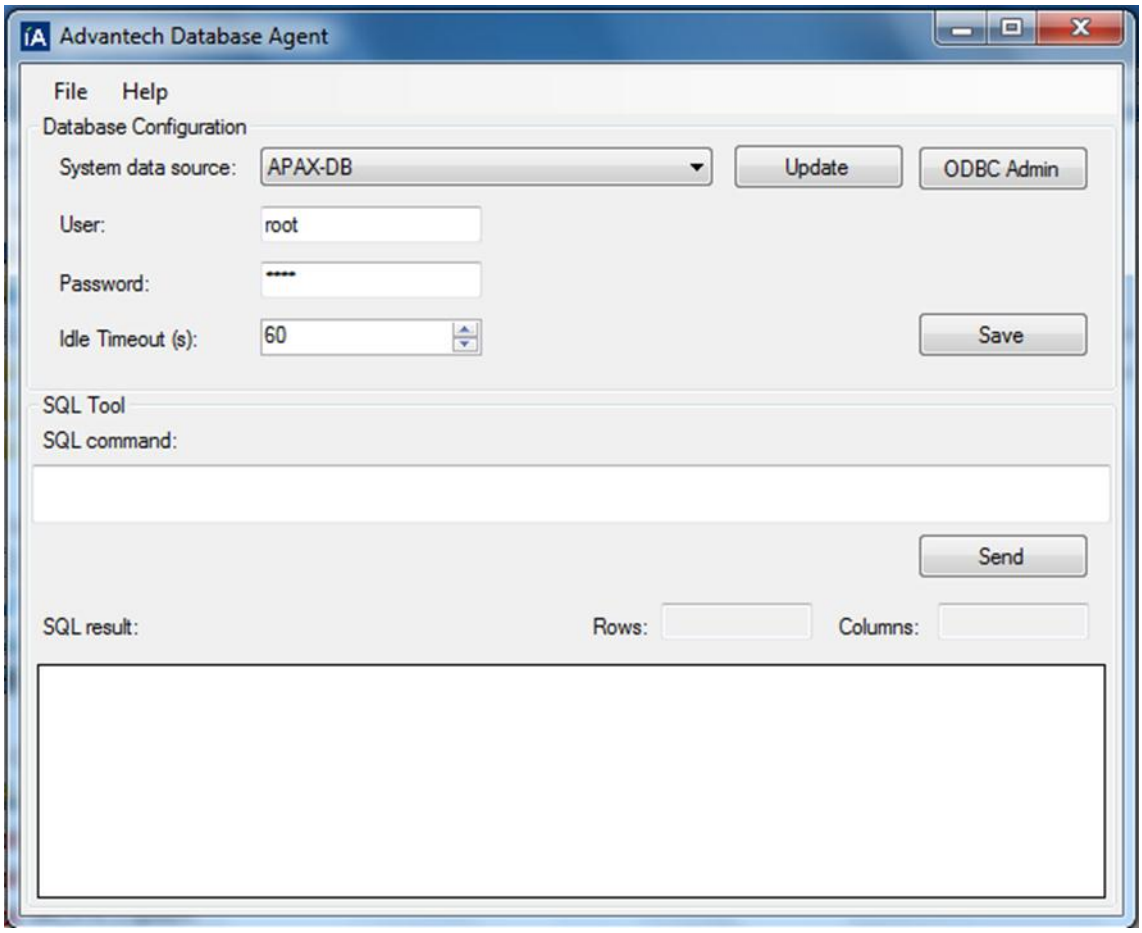


Step4: Fill the server configuration and check connection is successful.

Step5: Click “Update” button, you can find out the new system DSN

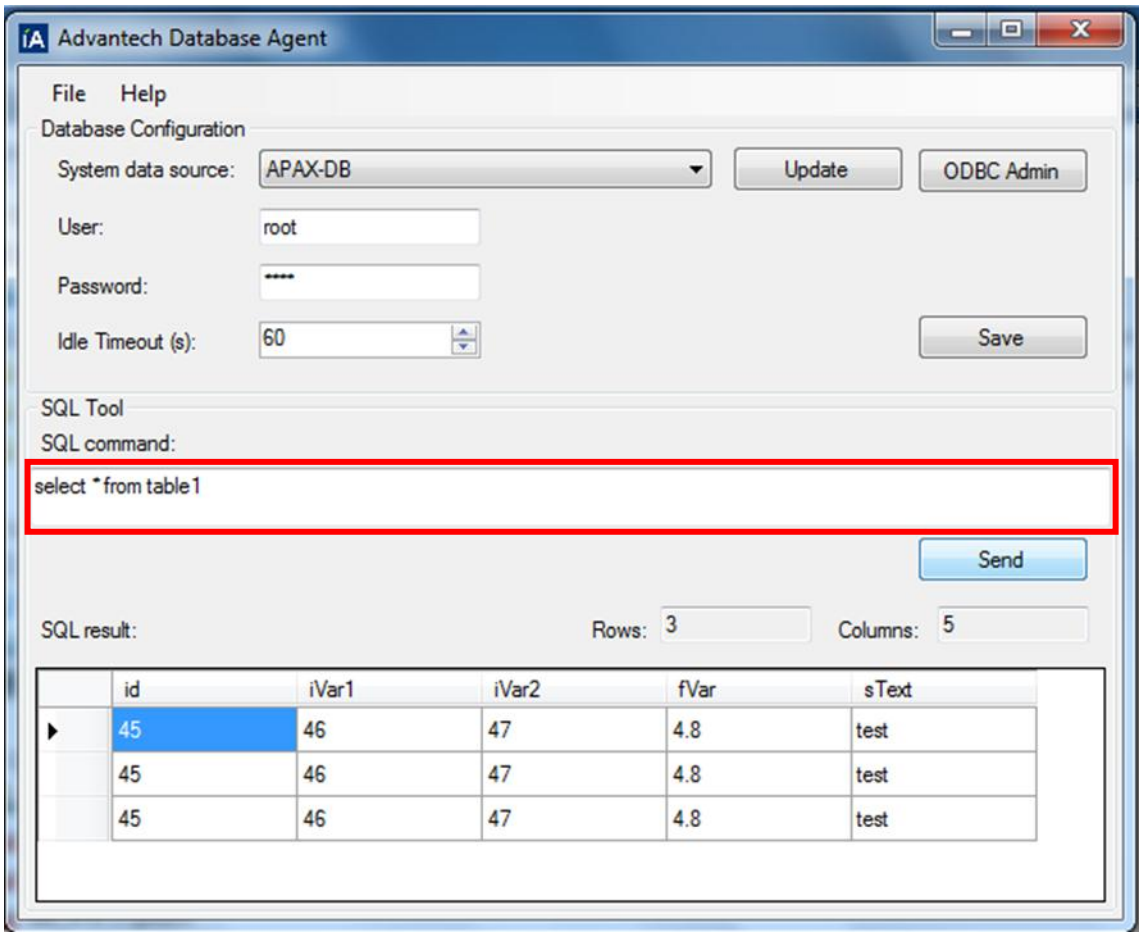


Step6: Fill the user name and password (If need). And then click “Save” button.



7.2. SQL tool

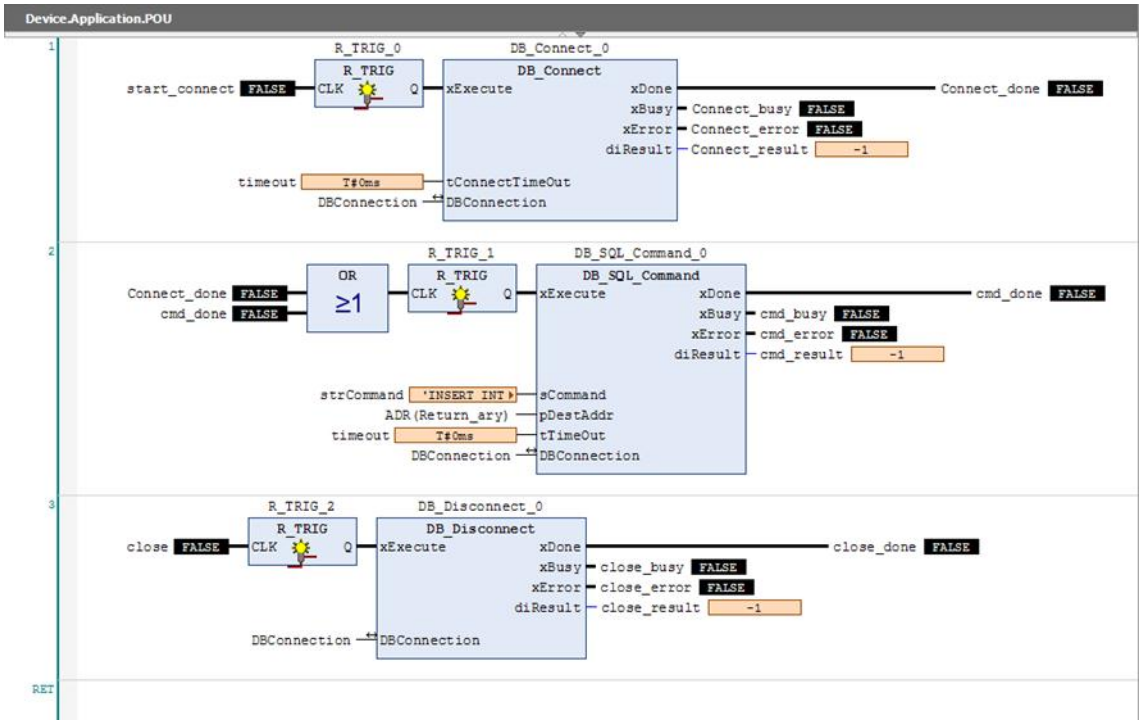
You can use SQL Tool to test SQL command validation.



8. Example

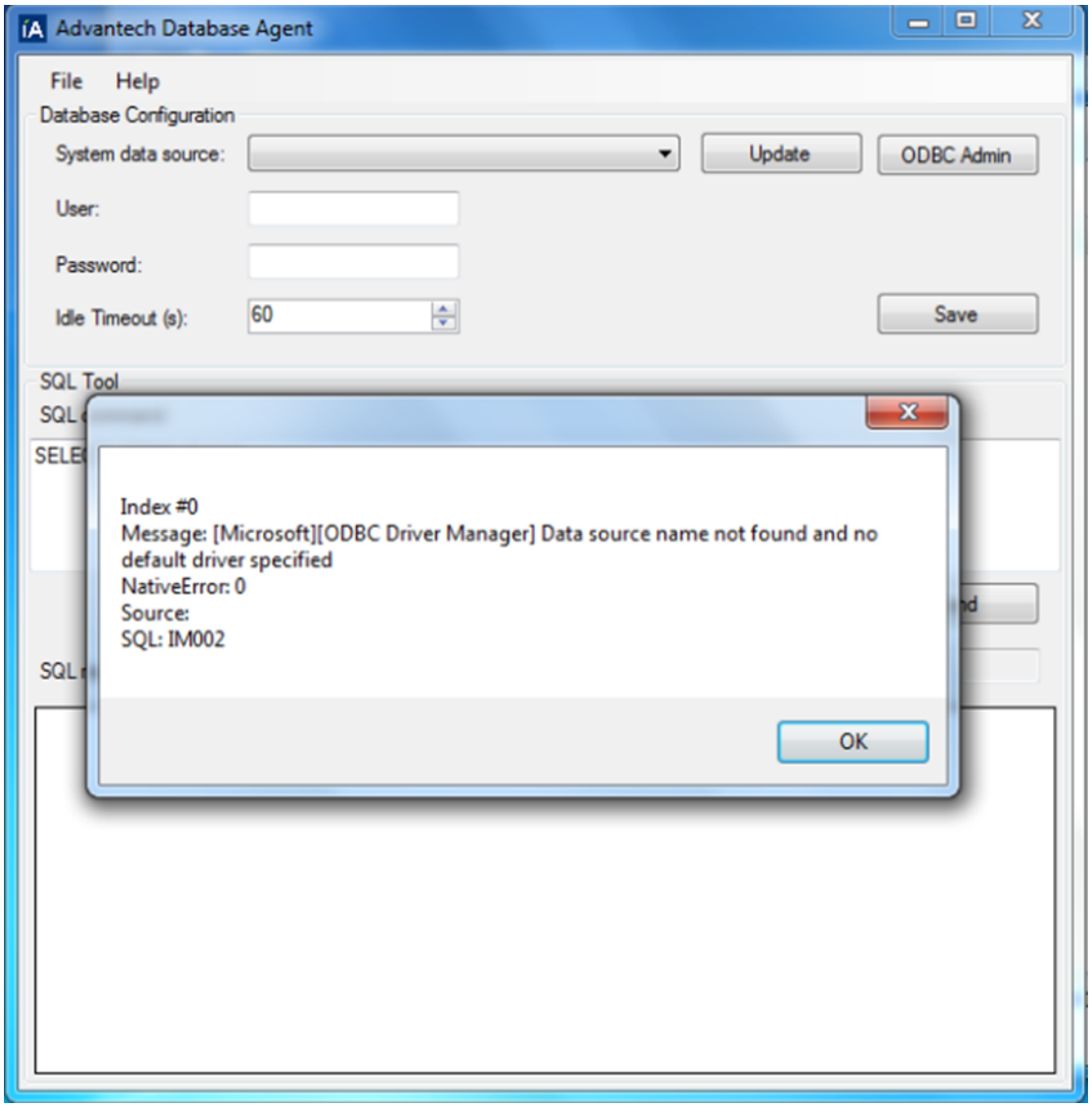
Go to “%**USERPROFILE**%\Advantech Database\”, and open “Advantech_Database_sample.projectarchive”, you can find the following example.

Set “start_connect = true” to create database connection and get a database connection handle. And then the program will send SQL command to database agent automatically. Finally, use DB_disconnect to close database connection handle.



9. Troubleshooting

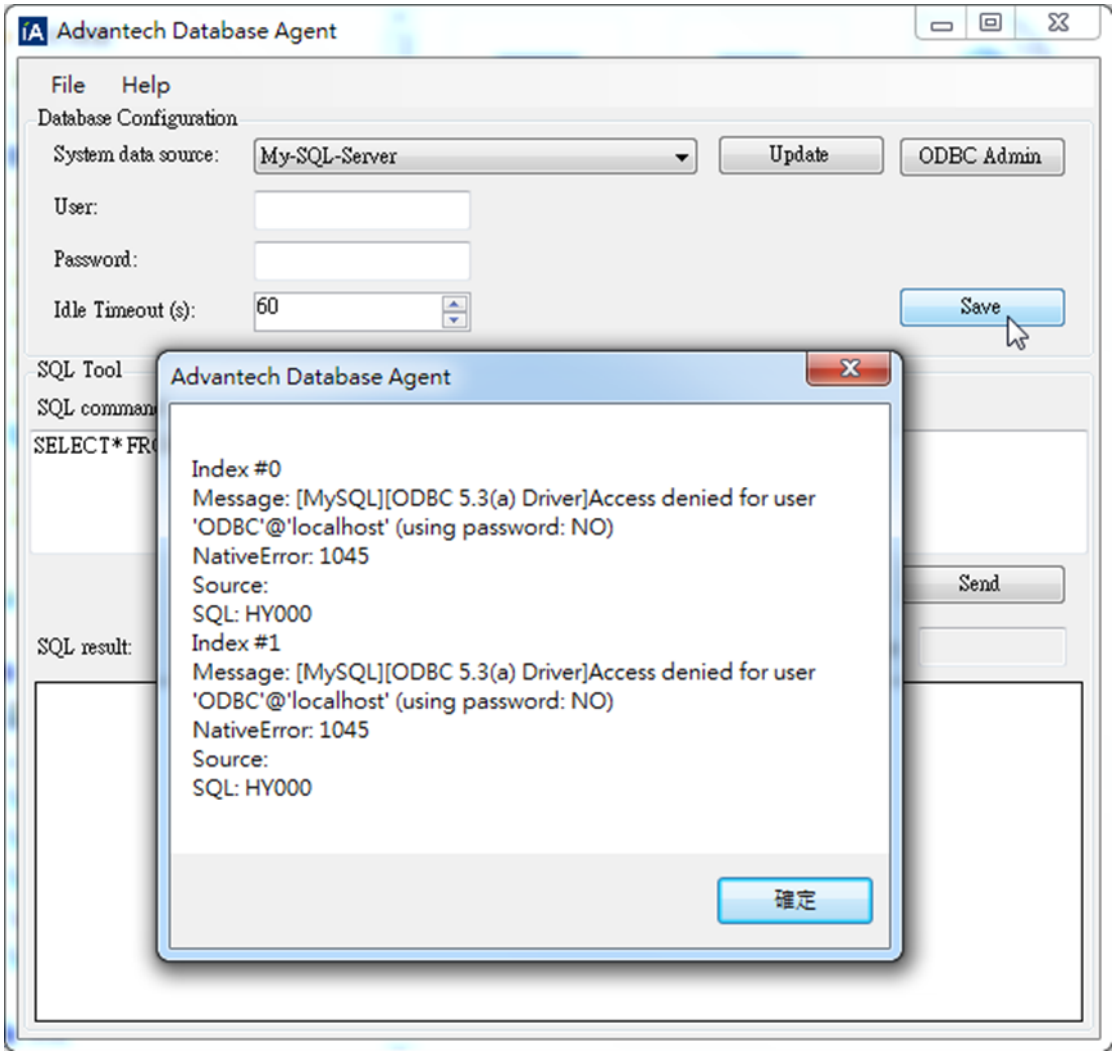
1. When open Advantech database agent at first time, it will pop up the error message windows:



Solution:

There are no system DSN settings at the agent, please configure the system DSN setting first. Finally, please click “Save” button to restart ODBC connection automatically.

2. After choose the correct system DSN and click “Save” button, it still pop up “Access denied” message window.



Solution:

Some SQL server (for example: MySQL) need account information (user name and password). Please fill the related items.