



Kepware Technologies

Modem Support in KEPServerEX V5

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1.Introduction

KEPServerEX supports the use of modems on all serial communication drivers. Once modem operation has been enabled for a KEPServerEX project, a set of predefined modem tags will become available to client applications for modem monitoring and control. These modem tags provide control of phone number, dial, hang up, and auto answer mode; additional modem tags provide the status of the modem connection. By using these modem tags, users can design the client applications to control all aspects of a dialup modem connection. KEPServerEX's built-in modem capabilities extends system management and data gathering needs beyond the local facility.

1.1 Requirements

Before KEPServerEX's modem operations may be used, a modem must be configured with the operating system. For information on setting up the modem through the Windows control panel, refer to Windows and modem documentation. Users should note that it is recommended that external modems be utilized for both the initiating and receiving modems: in testing, it was found that some internal modems would not accept settings that were imperative for some KEPServerEX serial protocol drivers. External modems are also easier to replace if they fail.

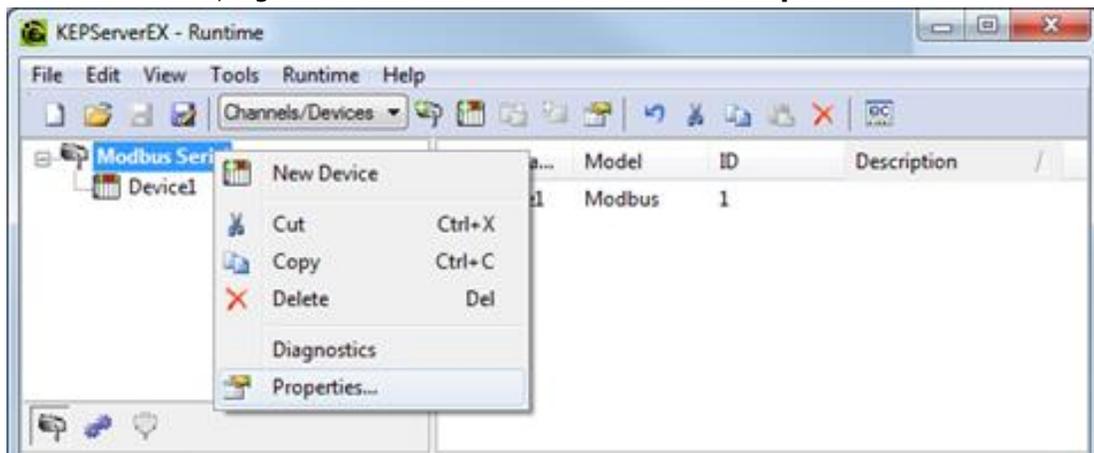
1.2 Making a Direct Serial Connection

Before enabling the modem, first make a direct serial connection to the device or PLC using KEPServerEX and the OPC Quick Client (if possible). This will help verify that the communication settings are correct between the server and the device or PLC. It will also confirm that the quality of the direct connect cable is good. For more information and instructions, refer to the [OPC Quick Client Help File](#). To access all of Kepware's product documentation, refer to [Product Manuals and Help Files](#).

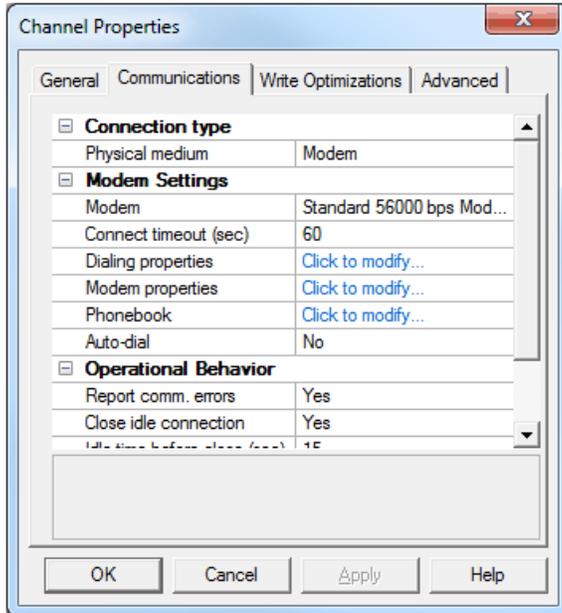
2.Enabling Modem Functionality in KEPServerEX for Modem Tag Access

Modem functionality must be enabled in KEPServerEX before modem tags can be accessed for use in a client application.

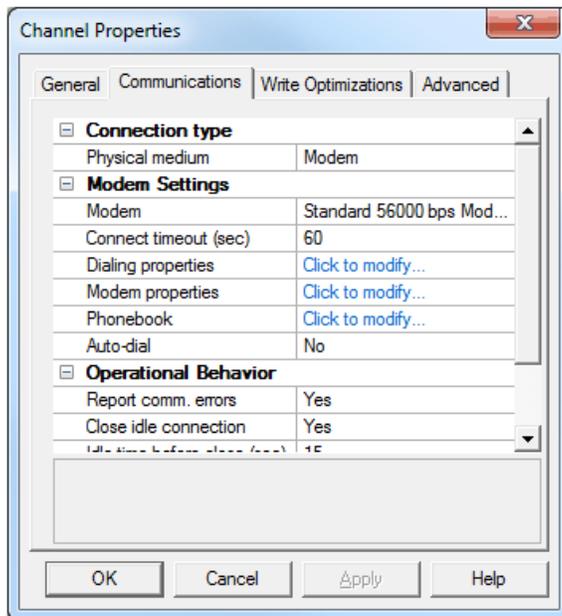
1. In KEPServerEX, right-click on the channel and select **Properties**.



- Next, open the **Communications** tab. Beneath **Connection Type**, locate **Physical Medium** and then select **Modem** from the drop-down menu.



- Beneath **Modem Settings**, locate **Modem** and then select the correct modem from the drop-down menu.



- Once the modem has been selected, the channel's dialing properties and modem properties can be set. For more information on those properties, refer to [Channel Properties - Communications](#).

Note: Modem tags should now be available on the channel level for client access

3.Using a Modem in the KEPServerEX Project

At this point, users must configure the initiating and receiving modems that will be used with the project. For more information, refer to [Using a Modem in the Server Project](#).

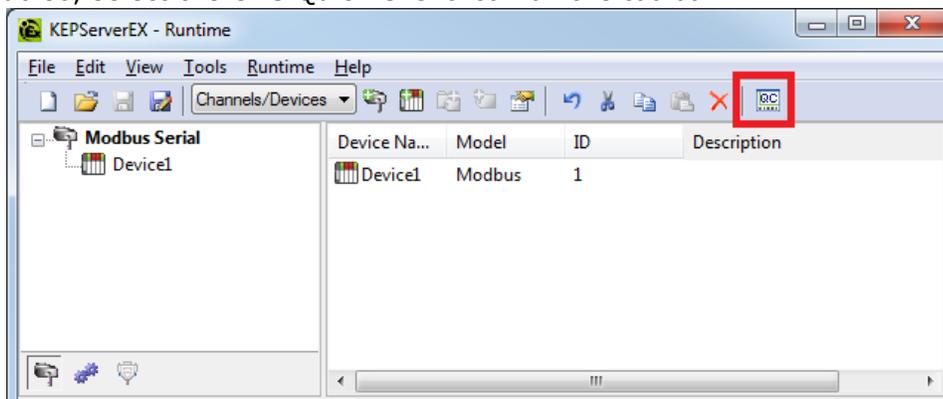
Note: It is strongly recommended that a terminal program like HyperTerminal be used to configure the receiving modem. Furthermore, users with a proven direct connection simply need to add a null modem connector to the direct connect cable. This cable and null modem will provide the connection between the receiving modem and PLC.

4.Accessing Modem Tags using OPC DA and DDE Clients

4.1 Accessing Modem Tags with an OPC DA Client

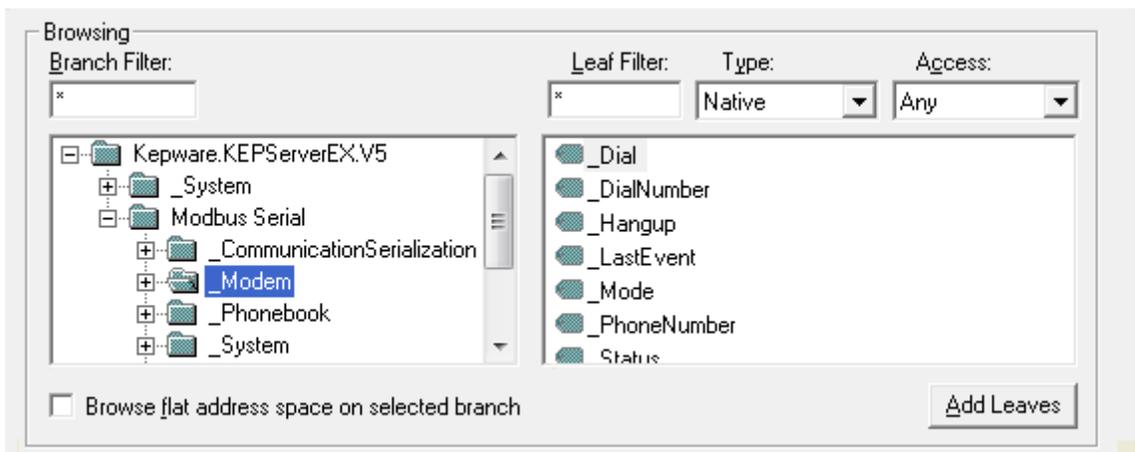
After modem functionality has been enabled on a channel in KEPServerEX, a set of predefined modem tags may be browsed using an OPC client. In the example below, OPC Quick Client is the browsing client.

1. To start, create a connection to KEPServerEX with the OPC Quick Client. To do so, select the OPC Quick Client icon on the toolbar.



Note: Selecting the icon will automatically invoke the OPC Quick Client and connect it to the server.

2. Once a connection has been made to KEPServerEX, browse for tags in the **_Modem** folder located at the channel level. This folder contains the predefined modem tags needed to control and monitor an attached modem.



3. Next, use the OPC browser to add the following tag items:

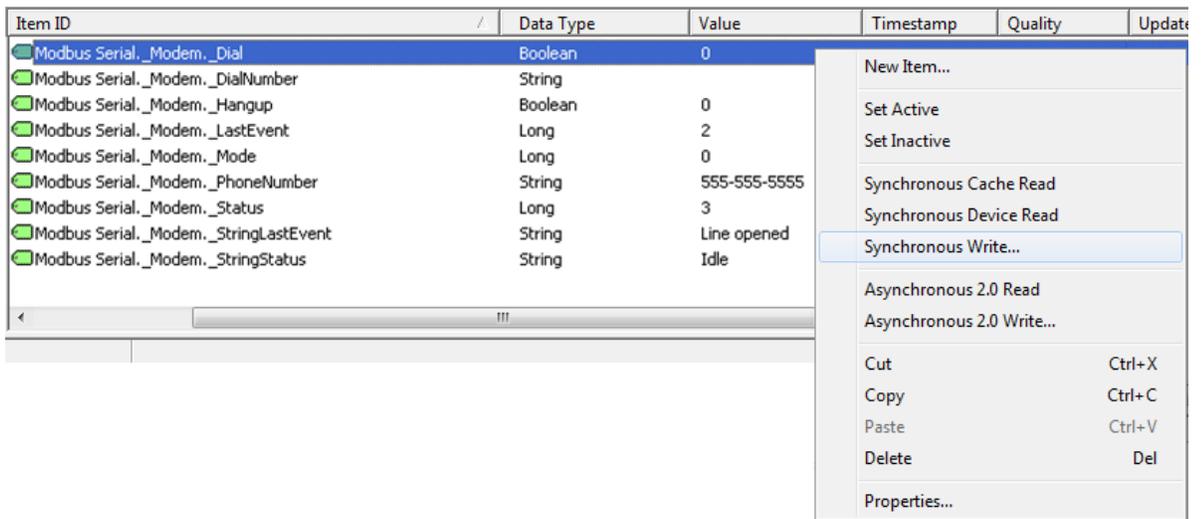
- _Dial
- _Hangup
- _Status
- _PhoneNumber
- _StringLastEvent
- _StringStatus

Note: These tags are crucial in making a modem connection.

Important: All modem operations are completely under the control of the client application. KEPServerEX does not have built-in polling routines that control connecting and disconnecting to remote devices. Users can create modem applications that are as simple or complex as the application requires. With the client's control and scripting capabilities, anything from auto dialing to polling routines can be created simply by manipulating the predefined modem tags.

4. Finally, either write the phone number that will be used to connect the modems with the _Phonenumber Tag or select the predefined phone number tag in the _Phonebook file using the OPC browser.
5. Then, write any number to the _Dial Tag to dial the phone number. If the modems are configured correctly, the initiating modem should dial and connect to the receiving modem.

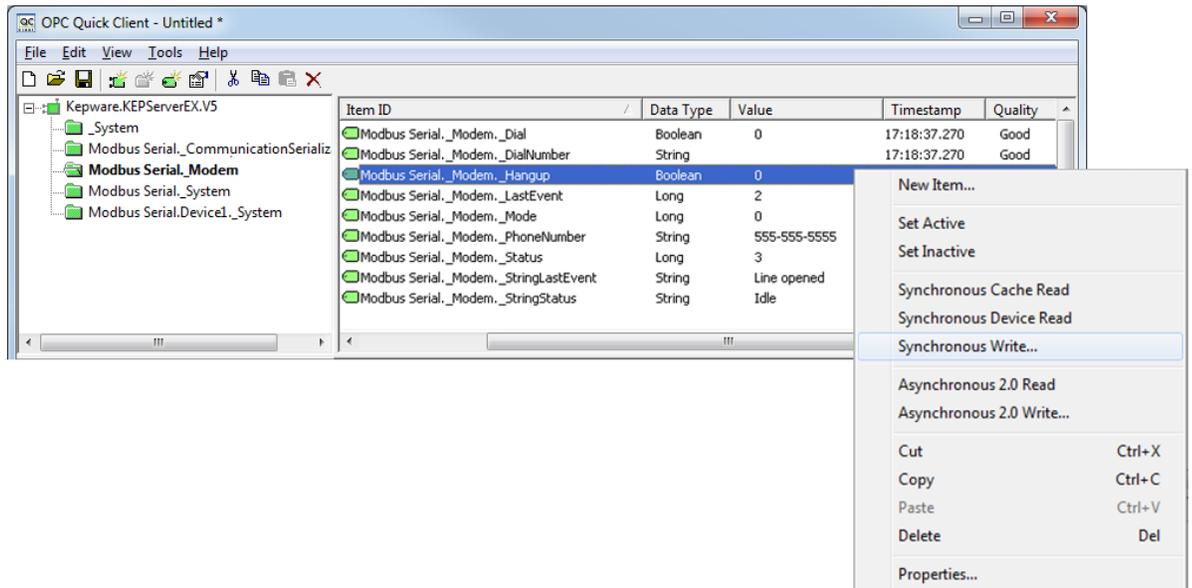
Item ID	Data Type	Value	Timestamp	Quality	Update
Modbus Serial._Modem._Dial	Boolean	0			
Modbus Serial._Modem._DialNumber	String				
Modbus Serial._Modem._Hangup	Boolean	0			
Modbus Serial._Modem._LastEvent	Long	2			
Modbus Serial._Modem._Mode	Long	0			
Modbus Serial._Modem._PhoneNumber	String	555-555-5555			
Modbus Serial._Modem._Status	Long	3			
Modbus Serial._Modem._StringLastEvent	String	Line opened			
Modbus Serial._Modem._StringStatus	String	Idle			



The screenshot shows a table with columns: Item ID, Data Type, Value, Timestamp, Quality, and Update. The first row is selected, and a context menu is open over it. The context menu options are: New Item..., Set Active, Set Inactive, Synchronous Cache Read, Synchronous Device Read, Synchronous Write..., Asynchronous 2.0 Read, Asynchronous 2.0 Write..., Cut (Ctrl+X), Copy (Ctrl+C), Paste (Ctrl+V), Delete (Del), and Properties...

6. Monitor the _Status Tag to verify the connection status; check the _StringStatus Tag to receive a string representation of the modem status. Then, decide how long to stay connected.

- Once finished viewing data from a particular remote device or PLC, hang up the connection. To do so, write a number to the _Hangup Tag. At this point, users can write a new phone number to the _PhoneNumber Tag and dial a new site if desired.



4.2 Accessing Modem Tags from a DDE Client

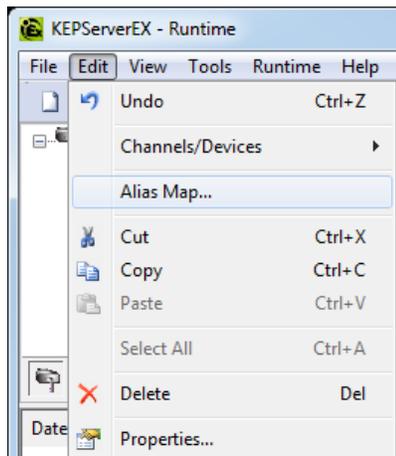
In the example below, Microsoft Excel is used as the DDE client.

- To start, ensure that DDE connections are enabled in the server. In KEPServerEX, click **File | Project Properties**. In the **DDE** tab, check **Enable DDE connections to the server** if it is not checked already. Once finished, click **OK**.



See Also: [Project Properties - DDE](#)

- Next, select **Edit | Alias Map**.



Note: For information on using the alias map (and instructions on how to access tags using two different access formats), refer to the [KEPServerEX V5 Help File](#). It is strongly recommended that users create an alias map and then use the alias name format instead of using full path names in the DDE application. This way, if the name of the channel or device changes, users will only have to reconfigure the alias map.

4.2.1 Reading and Writing with Modem Tags Using Microsoft Excel

For more information on reading and writing with modem tags, refer to [How To... Use DDE with the Server](#). For a general understanding of how to access DDE tags, refer below.

Path	Example	Syntax
Full address	=KEPDDE _ddedata!Channel_1._Modem._Dial	= <i>[Application or service name]</i> <i>[Topic]</i> ! <i>[Modem tag path]</i>
Alias	=kepdde Modem!_Dial	= <i>[Application or service name]</i> <i>[Alias path name as topic]</i> ! <i>[Modem Tag Name]</i>

5. Available Modem Tags

Modem tags allow users to control and monitor an attached modem. Operationally, KEPServerEX knows very little about what users or the application needs for modem control. With this in mind, KEPServerEX does not imply any type of control over the modem. By using predefined modem tags, users can utilize the control or scripting capabilities of their client application to control how KEPServerEX uses the selected modem. There are currently nine built-in System Tags available on each channel.

They are as follows:

- _Dial
- _DialNumber
- _Hangup
- _LastEvent
- _Mode
- _Status
- _StringLastEvent
- _StringStatus
- _PhoneNumber

6. Configuring Dial Scripting in the Client

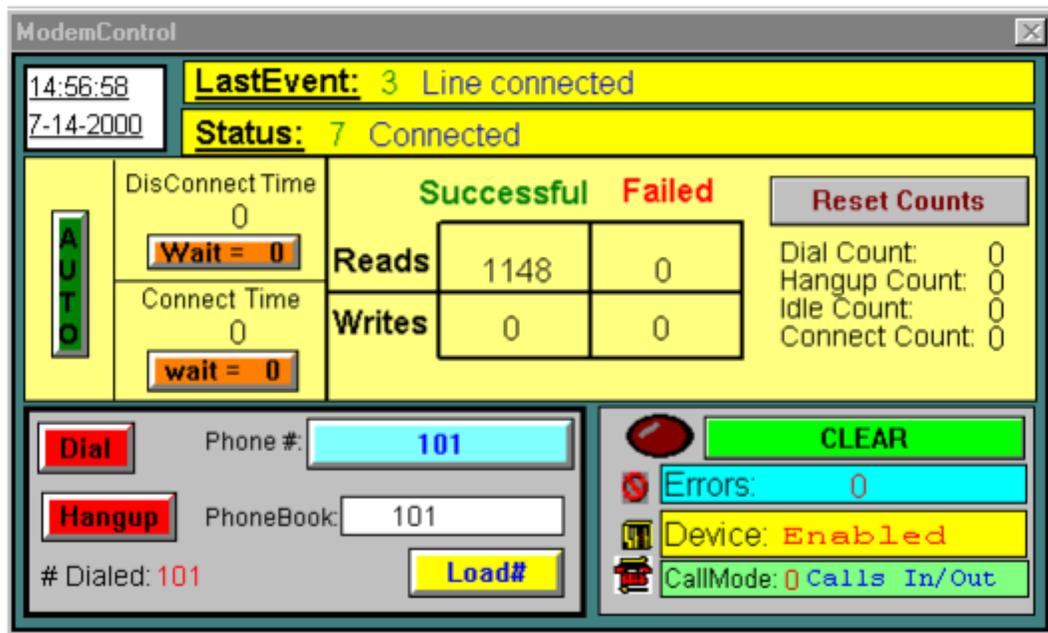
Because KEPServerEX does not have built-in polling routines and functions, it is users' responsibility to develop polling scripts in the client application that manipulate the modem tags and control the modem connection. This enables users to utilize the native scripting capabilities of whatever client application they like most. For an example of a possible dial routine, refer to the image below.

```
ModemTags → If Status = 3 then
               DialTimer = DialTimer + 1;
               EndIf;
               If DialTimer = 120 then
                 Dial = 1;
                 EndIf;
                 If Status = 7 then
                   OnlineTimer = OnlineTimer + 1;
                   EndIf;
                   If OnlineTimer = 60 then
                     Hangup = 1;
                     OnlineTimer = 0;
                     DialTimer = 0;
                     End If;
               End If;

               If AutoDial == 1 then
```

6.1 Modem Control Panel Example

For an example of a modem control window in an HMI client being used in conjunction with KEPServerEX, refer to the image below. Because the server and driver cannot acquire data from the device until the modem connection has been established, it is better to open the device's data screens after a connection has been made. The window shown below only acquires and displays modem tags.



Note 1: To increase the efficiency of the modem project, disable the device in the server when the modem connection is not established. Then, only enable it when it is. This prevents the server from polling for device tags until a modem

connection has been established. To do so, write 0 or 1 (On/Off) to the device-level System Tag "_Enabled" in the project script.

Note 2: All of Kepware's products have corresponding help documentation. To access the help files in PDF format, visit [Product Manuals and Help Files](#).