Telemecanique Uni-Telway Driver

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Help version 1.014

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Overview

The Telemecanique Uni-Telway Driver provides a reliable way to connect Telemecanique Uni-Telway Slave devices to OPC Client applications; including HMI, SCADA, Historian, MES, ERP, and countless custom applications. It is intended for use with Telemecanique devices that communicate using the Uni-Telway protocol.

Driver Setup

Slave ID
This driver will be seen as a slave on the Uni-Telway network; as such, it must respond to the master as it is polled. The assigned Slave ID will determine which poll request the driver responds to in the programmed sequence. Valid Slave IDs range from 1-253.

Response Timeout
This property specifies how long the driver should wait for intermediate responses from the master before timing out. An intermediate response is any single portion of a response frame or poll request from the master. Valid response timeout values range from 20 to 3000 ms. The default is 500 ms.

Message Timeout
This property specifies how long the driver should wait for the master to satisfy a request for data. Valid message timeout values range from 1 to 999 seconds. The default is 2 seconds.

Fail After
This property specifies how many times the driver will retry a communications request before considering the request to have failed. The valid range is 1 to 10 retries. The default is 6 retries. The number of retries configured for the application depends largely on the communications environment.

Device Setup

Supported Devices

Large Frame and Small Frame. Telemecanique Devices that do not support the full 128-byte data field provided by the Telemecanique Uni-Telway Slave protocol are considered Small Frame. One example of a Small Frame device is the TSX17-20.

Communication Protocol

Uni-Telway

Supported Communication Properties

Baud Rate: 1200, 2400, 9600, 19200 or 38400
Parity: None, Even or Odd
Data Bits: 5, 6, 7 or 8
Stop Bits: 1 or 2

Note: Due to the nature of the Uni-Telway protocol, users may be required to disable FIFO buffer usage on the COM port(s) that have been selected for use with this driver.

Device IDs

Each device connected to a Telemecanique network requires a five-layer address to identify itself.

Network 00 - FE (0 - 254)
Station 00 - FE (0 - 254)
Gate 00 - FE (0 - 254)
Module Rack 0 - F (0 - 15)/Module 0 - 7
Channel 00 - FE (0 - 254)

Telemecanique Uni-Telway Slave Tips

1. Make sure that the assigned Slave ID is valid. Since the driver is seen as a slave on the Uni-Telway network, make sure that the PLC (master) is polling the range that the Slave falls into. For example, if the master is polling devices 1-31, then a Slave ID of 32 would not be valid.

2. Make sure that the 5-layer Device ID is correct. When trying to communicate with one Master PLC, the Device ID for the master should be as follows. Addresses are in hex.

    Network - 0
    Station - FE
    Gate - 0
    Module - 0
    Channel - 0

3. Select either Sm_Frame or Lg_Frame depending on the Telemecanique PLC model with which communication is being established. For the Telemecanique PLC model TSX17, select the Sm_Frame option. For all other Telemecanique PLC models, select the Lg_Frame option.

4. Because an RS232/485 converter (which is capable of automatic direction control) will be used, we recommend that the Device Setup section of the Telemecanique Uni-Telway Slave help file be consulted. The specs of the converter we use may be faxed.

5. In some Telemecanique PLCs, the **Wait Time** can be configured. The Wait Time is the amount of time the PLC acting as the Uni-Telway master will wait when it issues poll messages to a slave device before timing out on the slave. The default in most cases is 10 milliseconds. If this time is increased

to 20 milliseconds or more, the driver's response time will dramatically improve due to the reduced number of missed poll messages. This property is available in the PLC configuration.

Converters

Depending on type of PLC being used, the TSX SCA 72 converter may not work. The TSX SCA 72 requires that the PC control the switching of the RS-485 transmitter/receiver on and off. This is done using the RTS line from the serial port. PLCs like the TSX37 respond quickly to the Telemecanique Uni-Telway Driver: the Windows communication driver is not fast enough to effectively control the TSX SCA 72s RS-485 line converter.

Schneider Automation (Electric) makes a modem cable that should work. The cable was designed for devices that do not manage the RTS signal. The part # is:TSX PCX 1031.

Note: Converters are to be used with our 32 bit Telemecanique Uni-Telway Driver.

Flow Control

When using an RS232/RS485 converter, the type of flow control that is required will depend upon the needs of the converter. Some converters do not require any flow control and others will require RTS flow.To determine the converter's flow requirements, refer to its documentation. We recommend using an RS485 converted that provides automatic flow control.

Note: When using the manufacturer's supplied communications cable, it is sometimes necessary to choose a flow control property of **RTS** or **RTS Always** under the Channel Properties.

Modem Setup

This driver supports modem functionality. For more information, please refer to the topic "Modem Support" in the OPC Server Help documentation.

Data Types Description

Data Type	Description
Boolean	Single bit
Word	Unsigned 16 bit value bit 0 is the low bit bit 15 is the high bit
Short	Signed 16 bit value bit 0 is the low bit bit 14 is the high bit bit 15 is the sign bit
DWord	Unsigned 32 bit value bit 0 is the least significant bit bit 31 the most significant bit
Long	Signed 32 bit value bit 0 is the least significant bit bit 30 the most significant bit bit 31 is the sign bit

Address Descriptions

Select a model type below to see address information for PLCs of that type. Telemecanique Devices that do not support the full 128-byte data field provided by the Telemecanique Uni-Telway Slave protocol are considered Small Frame. One example of a Small Frame device is the TSX17-20.

Small Frame
Large Frame

Small Frame Addresses

The default data types for dynamically defined tags are shown in **bold** .

Device Type	Range	Data Type	Access
Internal Word Memory	MW00000-MW32767* MWxxxxx.00 - MWxxxxx.15 MWxxxxx.L L = Number of words used for String Range: 1-15	Short, **Word**, Long, DWord Boolean String	Read/Write Read Only Read/Write
Internal Bit Memory	M0000-M4095	Boolean	Read/Write
Constant Memory	KW00000-KW32767* KWxxxxx.00-KWxxxxx.15	Short, **Word**, Long, DWord Boolean	Read Only Read Only
Timer Preset	T000.P-T127.P	Short, **Word**	Read/Write
Timer Value	T000.V-T127.V	Short, **Word**	Read Only
Timer Done Bit	T000.Q-T127.Q	Boolean	Read Only
Counter Preset	C000.P-C255.P	Short, **Word**	Read/Write
Counter Value	C000.V-C255.V	Short, **Word**	Read Only
Counter Done Bit	C000.D-C255.D	Boolean	Read Only
PL7 Timer Preset	TP000.P-TP127.P	Short, **Word**	Read/Write
PL7 Timer Value	TP000.V-TP127.V	Short, **Word**	Read Only
PL7 Timer Done Bit	TP000.Q-TP127.Q	Boolean	Read Only
IEC Timer Preset	TM000.P-TM127.P	Short, **Word**	Read/Write
IEC Timer Value	TM000.V-TM127.V	Short, **Word**	Read Only
IEC Timer Done Bit	TM000.Q-TM127.Q	Boolean	Read Only
PL7 Counter Preset	CP000.P-CP255.P	Short, **Word**	Read/Write
PL7 Counter Value	CP000.V-CP255.V	Short, **Word**	Read Only
PL7 Counter Done Bit	CP000.D-CP255.D	Boolean	Read Only

*Supports array notation. To specify an array, append the array size to the address specification as follows: address[array size] or address[rows][cols]. Small Frame arrays can have a maximum size of 15 word elements.

Note 1: Use PL7/IEC Timers (TP, TM Device Types) and PL7 Counter (CP Device Type) with TSX Micro or Premium PLCs. These types are not supported when using TSX Nano PLC.

Note 2: Maximum value for TP, TM and CP Device Types Preset is 9999. A write of a value greater than Maximum will fail with an error '06' (invalid write value).

Note 3: Timer and Counter types 'T' and 'C' are not supported when using TSX Nano, Micro or Premium PLCs and will fail with a "Negative Response Returned" error message.

Large Frame Addresses

The default data types for dynamically defined tags are shown in **bold**.

Device Type	Range	Data Type	Access
Internal Word Memory	MW00000-MW32767* MWxxxxx.00 - MWxxxxx.15 MWxxxxx.L L = Number of words used for String Range: 1-60	Short, **Word**, Long, DWord Boolean String	Read/Write Read Only Read/Write
Internal Bit Memory	M0000-M4095	Boolean	Read/Write
Constant Memory	KW00000-KW32767* KWxxxxx.00-KWxxxxx.15	Short, **Word**, Long, DWord Boolean	Read Only Read Only
Timer Preset	T000.P-T127.P	Short, **Word**	Read/Write
Timer Value	T000.V-T127.V	Short, **Word**	Read Only
Timer Done Bit	T000.Q-T127.Q	Boolean	Read Only
Counter Preset	C000.P-C255.P	Short, **Word**	Read/Write
Counter Value	C000.V-C255.V	Short, **Word**	Read Only
Counter Done Bit	C000.D-C255.D	Boolean	Read Only
PL7 Timer Preset	TP000.P-TP127.P	Short, **Word**	Read/Write
PL7 Timer Value	TP000.V-TP127.V	Short, **Word**	Read Only
PL7 Timer Done Bit	TP000.Q-TP127.Q	Boolean	Read Only
IEC Timer Preset	TM000.P-TM127.P	Short, **Word**	Read/Write
IEC Timer Value	TM000.V-TM127.V	Short, **Word**	Read Only
IEC Timer Done Bit	TM000.Q-TM127.Q	Boolean	Read Only
PL7 Counter Preset	CP000.P-CP255.P	Short, **Word**	Read/Write
PL7 Counter Value	CP000.V-CP255.V	Short, **Word**	Read Only
PL7 Counter Done Bit	CP000.D-CP255.D	Boolean	Read Only

*Supports array notation. To specify an array, append the array size to the address specification as follows: address [array size] or address[rows][cols]. Large Frame arrays can have a maximum size of 60 word elements.

Note 1: Use PL7/IEC Timers (TP, TM Device Types) and PL7 Counter (CP Device Type) with TSX Micro or Premium PLCs. These types are not supported when using TSX Nano PLC.

Note 2: Maximum value for TP, TM and CP Device Types Preset is 9999. A write of a value greater than Maximum will fail with an error '06' (invalid write value).

Note 3: Timer and Counter types 'T' and 'C' are not supported when using TSX Nano, Micro or Premium PLCs and will fail with a "Negative Response Returned" error message.

Error Descriptions

The following error/warning messages may be generated. Click on the link for a description of the message.

Address Validation

Missing address

Device address '<address>' contains a syntax error

Address '<address>' is out of range for the specified device or register

Data Type '<type>' is not valid for device address '<address>'

Device address '<address>' is Read Only

Serial Communications

COMn does not exist

Error opening COMn

COMn is in use by another application

Unable to set comm properties on COMn

Communications error on '<channel name>' [<error mask>]

Device Status Messages

Device '<device name>' is not responding

Unable to write to '<address>' on device '<device name>'

Device '<device name>' responded with error '<error byte>' (Tag '<address>', Size '<size>')

Device '<device name>' Negative Response Returned (Tag '<address>', Size '<size>')

Device '<device name>' Response Invalid (Tag '<address>', Size '<size>')

Missing address

Error Type:
Warning

Possible Cause:
A tag address that has been specified dynamically has no length.

Solution:
Re-enter the address in the client application.

Device address '<address>' contains a syntax error

Error Type:
Warning

Possible Cause:
A tag address that has been specified dynamically contains one or more invalid characters.

Solution:
Re-enter the address in the client application.

Address '<address>' is out of range for the specified device or register

Error Type:
Warning

Possible Cause:
A tag address that has been specified dynamically references a location that is beyond the range of supported locations for the device.

Solution:
Verify the address is correct; if it is not, re-enter it in the client application.

Data Type '<type>' is not valid for device address '<address>'

Error Type:
Warning

Possible Cause:
A tag address that has been specified dynamically has been assigned an invalid data type.

Solution:
Modify the requested data type in the client application.

Device address '<address>' is Read Only

Error Type:
Warning

Possible Cause:
A tag address that has been specified dynamically has a requested access mode that is not compatible with what the device supports for that address.

Solution:
Change the access mode in the client application.

COMn does not exist

Error Type:
Fatal

Possible Cause:
The specified COM port is not present on the target computer.

Solution:
Verify that the proper COM port has been selected.

Error opening COMn

Error Type:
Fatal

Possible Cause:

The specified COM port could not be opened due to an internal hardware or software problem on the target computer.

Solution:
Verify that the COM port is functional and may be accessed by other Windows applications.

COMn is in use by another application

Error Type:
Fatal

Possible Cause:
The serial port assigned to a device is being used by another application.

Solution:
Verify that the correct port has been assigned to the channel.

Unable to set comm properties on COMn

Error Type:
Fatal

Possible Cause:
The serial properties for the specified COM port are not valid.

Solution:
Verify the serial properties and make any necessary changes.

Communications error on '<channel name>' [<error mask>]

Error Type:
Serious

Error Mask Definitions:
B = Hardware break detected.
F = Framing error.
E = I/O error.
O = Character buffer overrun.
R = RX buffer overrun.
P = Received byte parity error.
T = TX buffer full.

Possible Cause:

1. The serial connection between the device and the host PC is bad.

2. The communications properties for the serial connection are incorrect.

Solution:

1. Verify the cabling between the PC and the PLC device.

2. Verify that the specified communications properties match those of the device.

Device '<device name>' is not responding

Error Type:
Serious

Possible Cause:

1. The serial connection between the device and the host PC is broken.

2. The communications properties for the serial connection are incorrect.

3. The named device may have been assigned an incorrect Network ID.

4. The response from the device took longer to receive than the amount of time specified in the "Request Timeout" device property.

Solution:

1. Verify the cabling between the PC and the PLC device.

2. Verify that the specified communications properties match those of the device.

3. Verify that the Network ID given to the named device matches that of the actual device.

4. Increase the Request Timeout property so that the entire response can be handled.

Unable to write to '<address>' on device '<device name>'

Error Type:
Serious

Possible Cause:

1. The serial connection between the device and the host PC is broken.

2. The communications properties for the serial connection are incorrect.

3. The named device may have been assigned an incorrect Network ID.

Solution:

1. Verify the cabling between the PC and the PLC device.

2. Verify that the specified communications properties match those of the device.

3. Verify that the Network ID given to the named device matches that of the actual device.

Device '<device name>' responded with error '<error byte>' (Tag '<address>', Size '<size>')

Error Type:
Warning

Possible Cause:
See the Solution.

Solution:
Use following tables to decode the error byte.

Read Error Byte Possible Values

Error Byte	Description
00h	Read performed
02h	Instance number outside configuration limits
03h	Number of bits to read not a multiple of 8
04h	Object not configured in PL7 application
05h	Response buffer overflow
07h	Access property, object label or element number incorrect
08h	Access temporarily not possible
09h	Number of reads requested equal to zero

Write Error Byte Possible Values

Error Byte	Description
00h	Write operation performed
01h	Element write-protected
02h	Instance number outside configuration limits
04h	Object not configured in PL7 application
06h	Invalid write value
08h	Access temporarily not possible
09h	Number of write operations requested equal to zero

Device '<device name>' Negative Response Returned (Tag '<address>', Size '<size>')

Error Type:
Serious

Possible Cause:
An unsupported type was used.

Solution:
Use a supported type.

Device '<device name>' Response Invalid (Tag '<address>', Size '<size>')

Error Type:
Warning

Possible Cause:
Either an unsupported type was used or the PLC does not support the type.

Solution:
Use a supported type.

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