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Quick Start Guide — Universal Device Driver

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Version 1.005

Introduction

This document provides information for quickly configuring the Universal Device Driver (UDD) with Kepware servers (version 6.10 and above).

What is the Universal Device Driver?

The Universal Device Driver allows users to create custom drivers that leverage JavaScript as the scripting language. The driver allows custom Ethernet-based drivers as well as custom file-based drivers.
The custom Ethernet-based driver can connect to a wide variety of industrial and IoT devices. These devices may include bar code scanners, weigh scales, sensors, or devices with embedded APIs. A user creates a JavaScript profile script that manages the building or parsing of data payloads with the device, validates addressing of the tags configured in the server, configures Ethernet connection behavior, and manages the driver's state machine. Ethernet connection management with the device (i.e. TCP sockets) is handled by the driver outside of the profile script, eliminating the need for the user to manage socket-level interactions with the device.
The custom file-based driver can perform a variety of file operations; such as open, close, read, write, create, delete, move, and asynchronously watch for changes. A user creates a JavaScript profile script that manages validating tag addresses configured in the server, builds or parses data payloads to be written to or read from files, and issues file operation requests. Interactions with files are handled by the driver outside of the profile script.
OPC and other proprietary client interface technologies are handled within the server.

Ethernet-Based Communication Paradigms

The Universal Device Driver supports the following Ethernet-based communication paradigms:

- Simple Solicited
- Simple Unsolicited
- Publish / Subscribe
- Mixed Mode

Components and Concepts

Several components are installed with the Universal Device Driver and it is necessary to have a general understanding of what they are and how they interact.

Script Engine

Installing the Universal Device Driver adds a server component Script Engine. The service is an isolated environment to run the V8 JavaScript engine. All interaction is handled by the server, so the user does not need to interact with the service directly. The service is started when the driver registers a profile script to execute and stops five minutes after use.

Profile

A Profile exists inside the Profile Library and contains a script. Profiles determine how the Universal Device Driver communicates with a device or how the driver operates on a file.

Profile Library

The Profile Library is where profiles are stored as part of the server configuration.

Profile Script for Ethernet- Based Communication

The Profile Script for Ethernet- Based communication is a set of JavaScript functions that contain the information to communicate with a device using a protocol. The current interface requires four functions to communicate with a device:

- onProfileLoad()
- onValidateTag()
- onProfileInputsChange()
- onTagsRequest()
- onData()

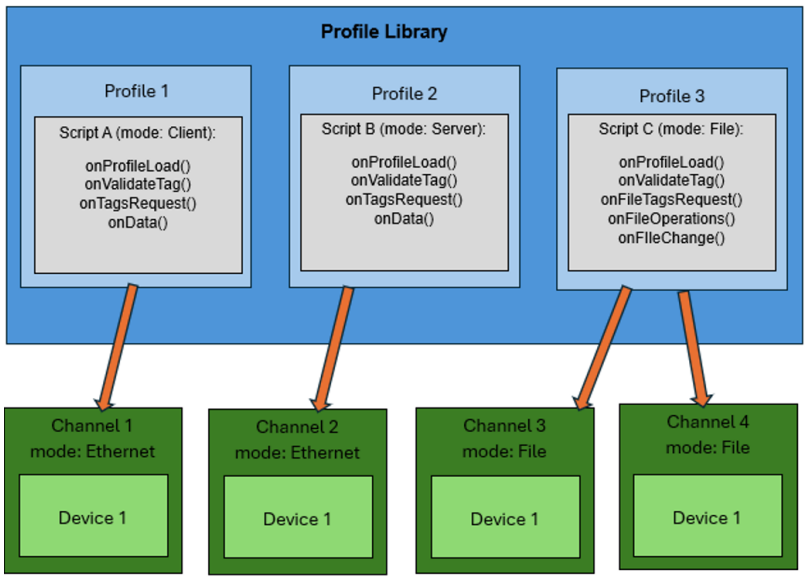
Profile Script for File- Based Communication

The Profile Script for file- based communication is a set of JavaScript functions that contain the information to operate on files. The current interface requires five functions:

- onProfileLoad()
- onValidateTag()
- onProfileInputsChange()
- onFileTagsRequest()
- onFileOperations()
- onFileChange()

Linking

Linking is the process of associating a UDD channel with a profile to communicate with a device. The image below provides an overview of how a UDD project could be structured and what linking a profile to a channel means.



Considerations

The Profile Library can contain multiple profiles, each independent of each other.
Each Profile can be linked to multiple channels (1:many).
Each channel can only be linked to one profile (1:1).

Each channel maintains an independent state or context. For example, runtime changes in Channel 1 do not affect Channel 2, even if they share the same Profile Script.

Configuring the Universal Device Driver

The configuration of the Universal Device Driver is similar to other drivers within the Kepware server: create a channel, create a device, then add tags and tag groups. However, there are two additional steps that must be completed to configure the driver itself.

It is necessary to load JavaScript profiles into the Profile Library to begin. Once loaded, a UDD channel can access the profiles in the Profile Library.

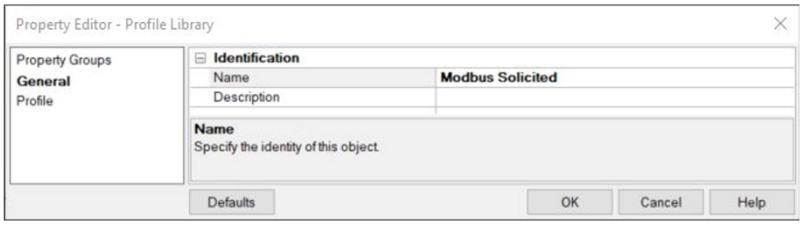
Linking is the process of associating a UDD channel with a profile to communicate with a device or operate on files. This process is completed when configuring a UDD channel.

Loading a Profile

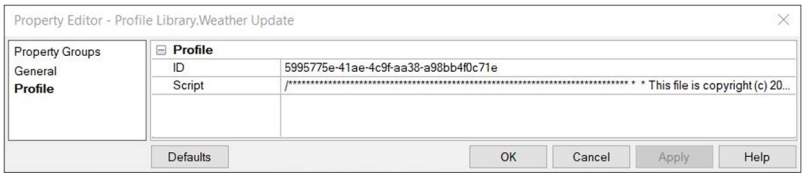
1. Navigate to **Profile Library** node in the project explorer tree.
2. Select **Add Profile...** under **Profile Library** in the project explorer tree (or right-click and choose **New Profile**).



3. Give the profile a Name. This is the name that will appear under the **Profile Library**.

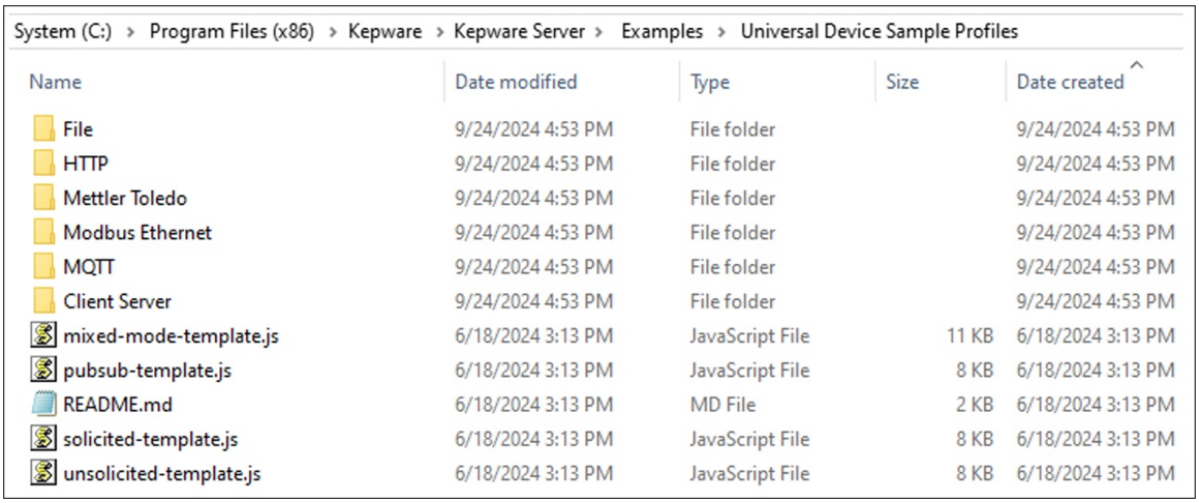


4. Open the **Profile** tab and click on the (..) ellipses to the right of the **Script** field.

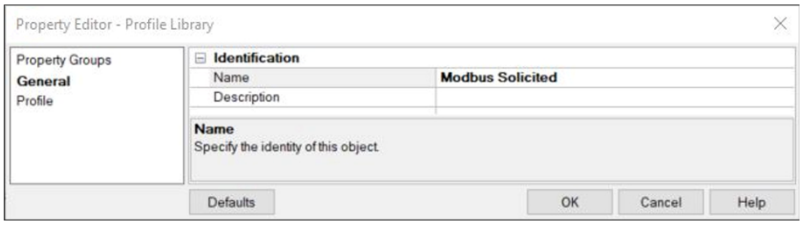


5. Navigate to the profile script directory and select the .js file.

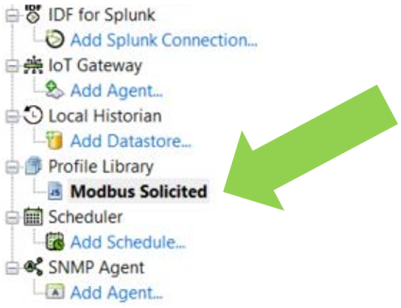
> Tip: Example profile scripts are located at within the installation directory in the folder: \ Examples\ Universal Device Sample Profiles\



6. Copy the string in the **ID** field for later use.



7. Confirm that your profile has been added to the Profile Library node.



Linking a Profile

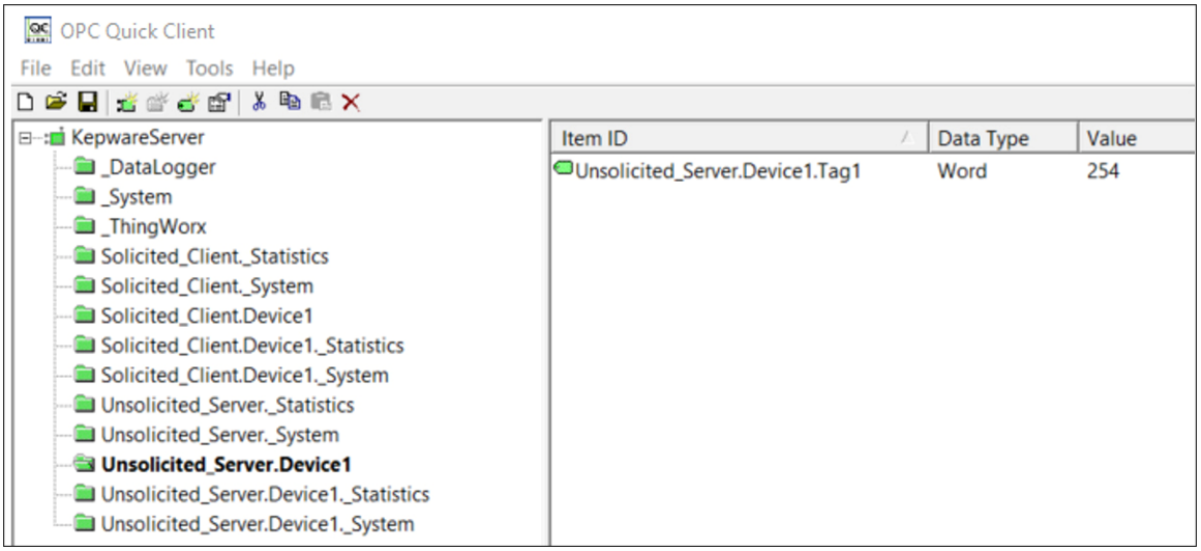
1. Click Add a Channel in the project tree.
2. Select the **Universal Device Driver**.
3. Click **Next** until you get to the screen below.
4. Paste the **Profile ID** in the field. This is the Linking process described earlier.
5. Select the mode that matches the profile mode configured within the script. If the script is a Server or Client mode, select **Ethernet**. If the script is a File mode, select **File**.
6. Click **Next** to see the summary Channel wizard page and finally click Finish to create the Universal Device channel.
7. Right- click on the new channel and select **New Device**.
8. Enter the device name and click **Next** through the Wizard pages. If the Channel property for mode is Ethernet, configure the Communication Transport properties,

9. such as IP Protocol, Source IP or Hostname (for UDP), Destination IP or Hostname (for TCP/ IP), Port, and TCP Keep- Alive properties (if applicable). If the Channel property for mode is File, configure the File Mode properties, such as Base Path, File Name (if applicable), and Max File Size.

   Tip: The directory in the Base Path must exist to utilize file operations.

10. Review the summary Device wizard page and click **Finish**.
    OR
    Right- click on the new device and select either **New Tag Group**, **New Tag**, or **Import CSV** to add tags to the device.

11. Open the Quick Client to confirm the flow of data.



Congratulations!

Proprietary Notice

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