IODD Viewer

User Manual

V1.4
May 2022

Overview

The IODD Viewer displays IO Device Descriptions (IODDs) in a human-readable way.

The Viewer contains and uses the Schema, StandardDefinition and StandardUnitDefinition files published with the IODD Specification V1.1.3 (**Package 2020**, updated 2022-05). That means, it is mainly targeted at IODDs V1.1.3 and their V1.0.1 counterparts for backward compatibility of V1.1.3 devices. In the following text and in the user interface of the program, V1.1 actually means V1.1.3, and V1.0.1 actually means V1.0.1 for backward compatibility of V1.1.3 devices.

Old V1.1 or V1.0.1 IODDs can still be handled, because there was only a slight schema change to enable wireless IO-Link, but the displayed texts for standard variables / standard units may deviate a bit from the original specification.

The IODD Viewer can only display a single IODD at a given time, but it is possible to run several instances of the IODD Viewer on the same computer at the same time. Note however, that the saved settings of the Viewer are that of the instance that was closed last.

The IODD Checkers available from the IO-Link web site may be integrated in the Viewer so that the currently opened IODD may be checked or stamped with a single click.

Your favourite XML Editor may also be integrated in the Viewer, so that the currently opened IODD may be edited with a single click. There is no need to exit the Viewer while working in the Editor.

There is a fancy Clone function that copies an IODD, together with its external text files to a new name. If a different destination directory is issued, the referenced graphics file will be copied there too.

So the work flow for developing an IODD is this:

1. Use the Viewer to look at the examples and existing IODDs until you find one that is similar to your device.
2. Use Clone to make a copy.
3. Start the XML Editor without exiting the Viewer.
4. Edit; then save.
5. In the Viewer, click Reload and control the results. If not ok, goto 4.
6. In the Viewer, click Check to let the IODD Checker check the file(s). If not ok, goto 4.
7. Click Stamp to let the IODD Checker stamp the file(s).

Deployment

Just unzip it anywhere you like. It is probably good to put it into the directory <*program directory*>\IO-Link Community\IODD Viewer, i.e. alongside the IODD Checker(s).

The Viewer requires Microsoft .NET Framework 4.5 which comes pre-installed in all current versions of Microsoft Windows. Please use Microsoft Update to receive the latest fixes.

To use the IODD Checker for V1.1 IODDs and for V1.0.1 IODDs from within the IODD Viewer, please download the IODD Checkers from http://www.io-link.com/ and deploy them. Then insert the path to the Checkers in the Options menu.

The Checker may optionally utilize Xerces as an additional XML Parser (see Apache XML Project http://xerces.apache.org/xerces-c/). The latest version at the time of this writing is 3.2.3, but for a while now, there are no binary distributions anymore. For the time being, please use the last available binary distribution:

- Go to the download page for the latest binaries http://archive.apache.org/dist/xerces/c/3/binaries/.
- Download xerces-c-3.1.1-x86_64-windows-vc-10.0.zip. (If you only have a 32 bit Windows installation download xerces-c-3.1.1-x86-windows-vc-10.0.zip instead.)
- From this big ZIP file, only the two files DOMCount.exe and xerces-c_3_1.dll from the subdirectory "bin" are actually needed. Put these two files in a directory you like. Then, add "-xe -xp<*your xerces directory*>" to the Checker's command line arguments in the Options menu. You have to surround the directory with double quotes if it contains space characters.
- If you get the error message "DOMCount.exe – Unable to Locate Component. This application has failed to start because MSVCR100.dll was not found. Re-installing the application may fix this problem." when checking IODDs, then you don't have the appropriate Microsoft Visual C++ Redistributable Package and have to download and install it manually.
    - Msvcr100.dll: Microsoft Visual C++ 10.0 (in Microsoft Visual Studio 2010) 64 bit: http://www.microsoft.com/en-us/download/details.aspx?id=13523 (32 bit: http://www.microsoft.com/en-us/download/details.aspx?id=8328)

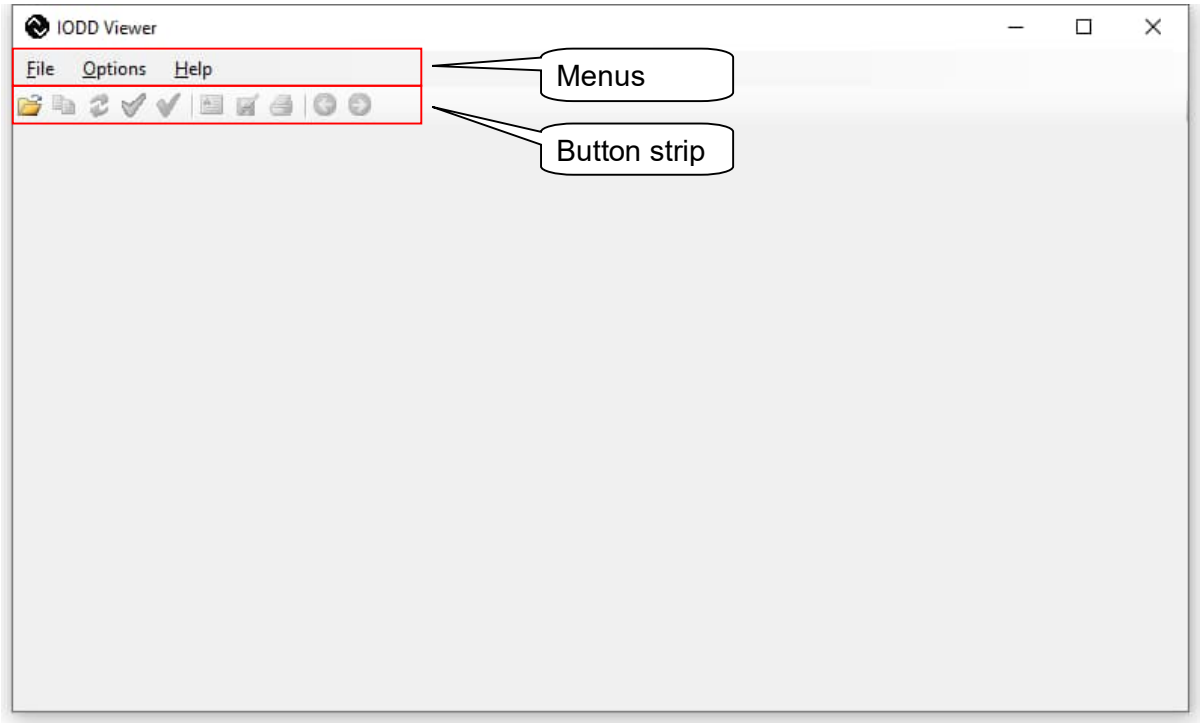
To use your favourite XML Editor from within the IODD Viewer, insert the path to the editor in the Options menu.

Start of the Viewer

The Viewer may be started without command line arguments or with a single command line argument which is the file name of the IODD to be opened. Note that you have to surround the path/file name with double quotes if it contains space characters.

The Viewer saves the position, size and state of the window when closing in the Windows Registry and restores it when starting. Note that the window state "Minimized" is not saved, instead "Normal" is saved.

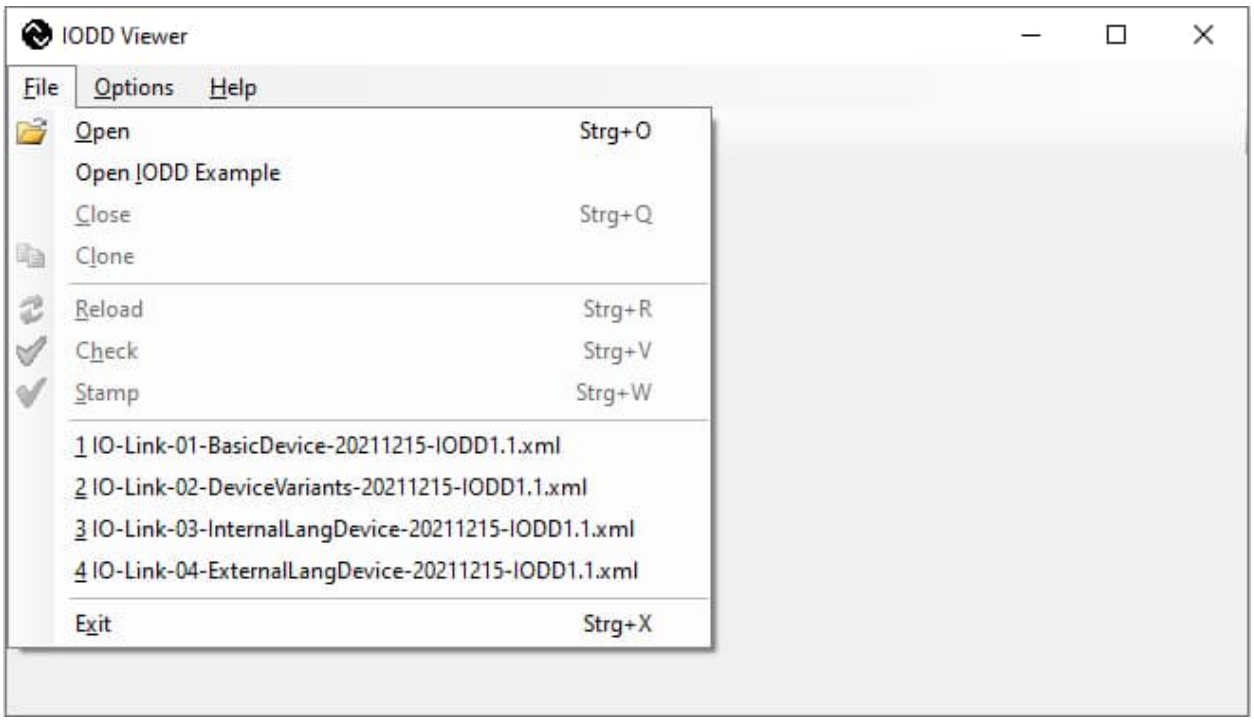
Behavior without opened IODD:



Regarding the button strip: Most buttons are just shortcuts to menu entries with the same functionality, and will therefore not be explained separately. Only the two right-most buttons have new functionality.

Menu items and buttons are only enabled when their function is applicable in the current situation.

Menu File:



Open: Opens a dialog for opening an IODD, in the last used directory.
It is possible to open a main IODD file (*.xml) directly, or a ZIP file containing an IODD (*.zip). A ZIP file that does not contain a main IODD file cannot be opened. On a ZIP file containing more than one IODD file, the first found main IODD file is opened, and a warning message is given.

Open IODD Example: Opens a dialog for opening an IODD in the directory *<place of IODD Viewer.exe>*\Examples.

List of file names: Recently opened IODDs (max. 4). This list is saved in the Windows Registry.

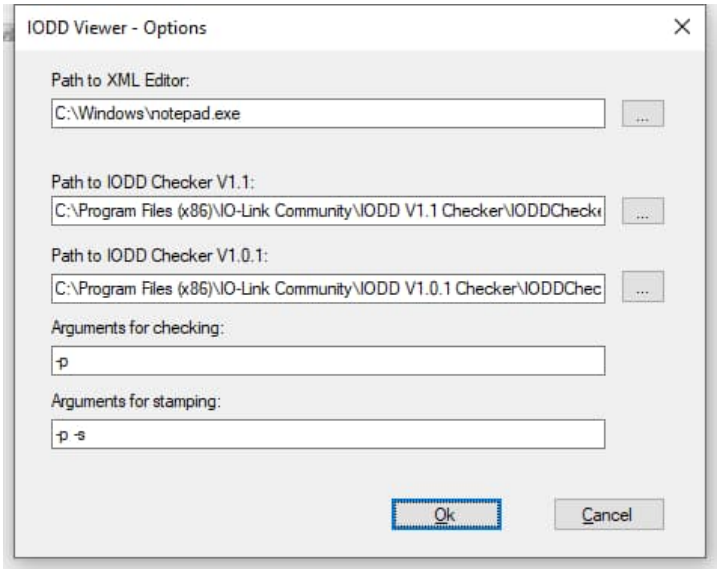
Exit: Exits the program.

It is also possible to open an IODD by drag-and-drop of an IODD (directly or contained in a ZIP file) from the Windows Explorer. Drag-and-drop from Outlook (from an E-mail) is not possible, because this is a totally different mechanism.

When an IODD is opened, external text documents are opened too. According to the IODD specification, they will be searched in the same directory as the IODD, their file name being identical except for an additional language code.

Menu Options:

These settings are saved in the Windows Registry.



Behavior of the text boxes:

The operations cut (Ctrl+X), copy (Ctrl+C), paste (Ctrl+V) and select all (Ctrl-A) are supported.

Behavior of the "…" buttons:

The button starts the "open file dialog" for finding the respective executable file. If the current text in the corresponding text box is a valid path with an existing directory, the file dialog starts there. Otherwise it starts at the program files directory (typically "C:\Program Files").

Path to XML Editor: Here you can enter the path to your favourite XML Editor. No command line arguments may be entered! When the IODD Viewer starts the editor, it uses the name of the XML file, surrounded by double quotes, as the single command line argument.
Default: Notepad.exe in the standard Windows directory (adjusted to your Windows installation).
Note that the Viewer does not check whether the executable file actually exists until Edit is clicked.

Path to IODD Checker V1.1: Here you can enter the path to the IODD Checker V1.1. No command line arguments may be entered! When the IODD Viewer starts the Checker, it uses the command line arguments given for checking / stamping followed by the name of the XML file, surrounded by double quotes.
Default: "IO-Link Community\IODD V1.1 Checker\IODDChecker.exe" in the program files directory (adjusted to your Windows installation).
Note that the Viewer does not check whether the executable file actually exists until Check / Stamp is clicked.

Note: The IODD Viewer does not detect whether an IODD based on schema V1.1 is a V1.1.3 IODD or an old V1.1 IODD. You need to insert the path to the appropriate IODD Checker version here. At the time of this writing, it is "V1.1.8" for V1.1.3 IODDs and "V1.1.4 R1" for V1.1 IODDs.

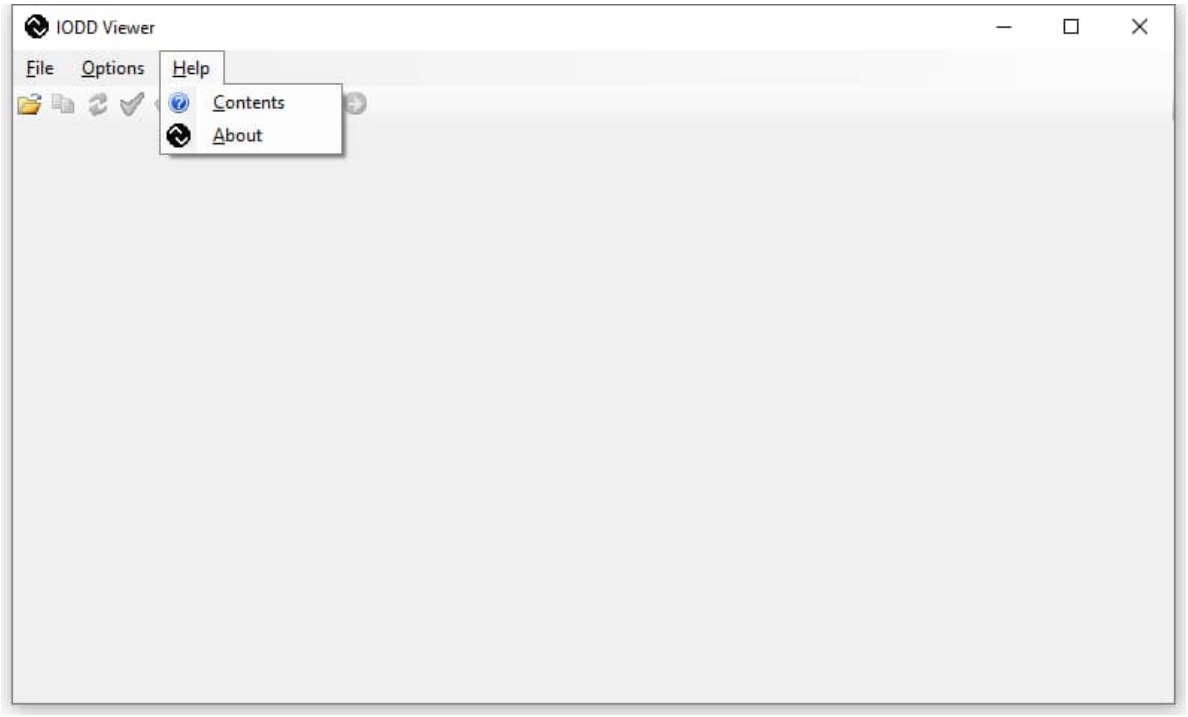
Path to IODD Checker V1.0.1: Here you can enter the path to the IODD Checker V1.0.1. No command line arguments may be entered! When the IODD Viewer starts the Checker, it uses the command line arguments given for checking / stamping followed by the name of the XML file, surrounded by double quotes.
Default: "IO-Link Community\IODD V1.0.1 Checker\IODDChecker.exe" in the program files directory (adjusted to your Windows installation).

Note that the Viewer does not check whether the executable file actually exists until Check / Stamp is clicked.

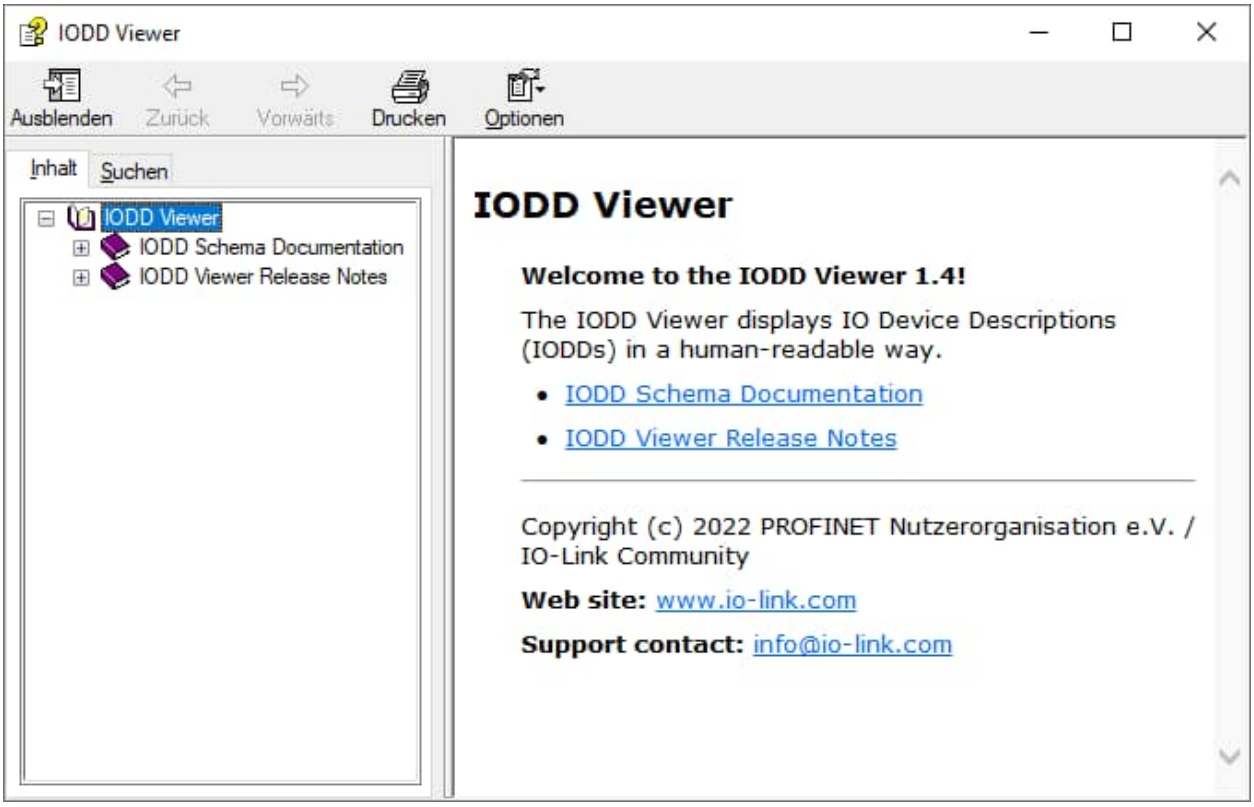
Arguments for checking: Enter the command line arguments that let the IODD Checker check the file without modifying it.
Default: -p

Arguments for stamping: Enter the command line arguments that let the IODD Checker stamp (modify) the file.
Default: -p -s

Menu Help:

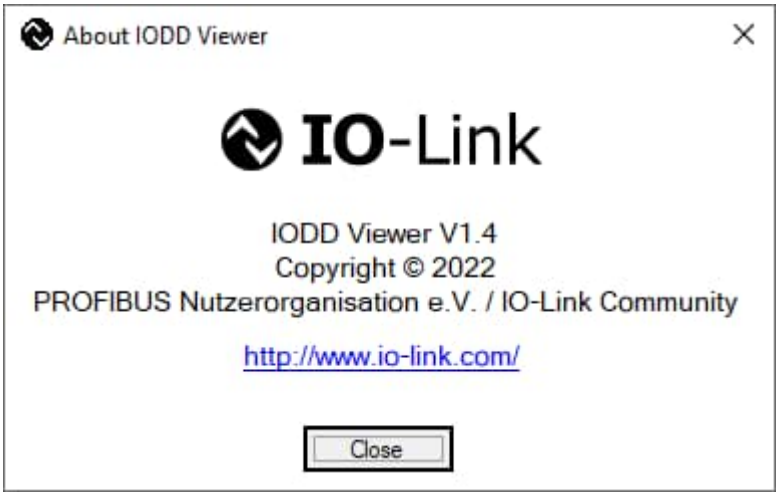


Contents: Opens the help file:



The help file contains the schema documentation for IODD V1.0.1 and V1.1 (according to IODD specification V1.1.3) and the release notes.

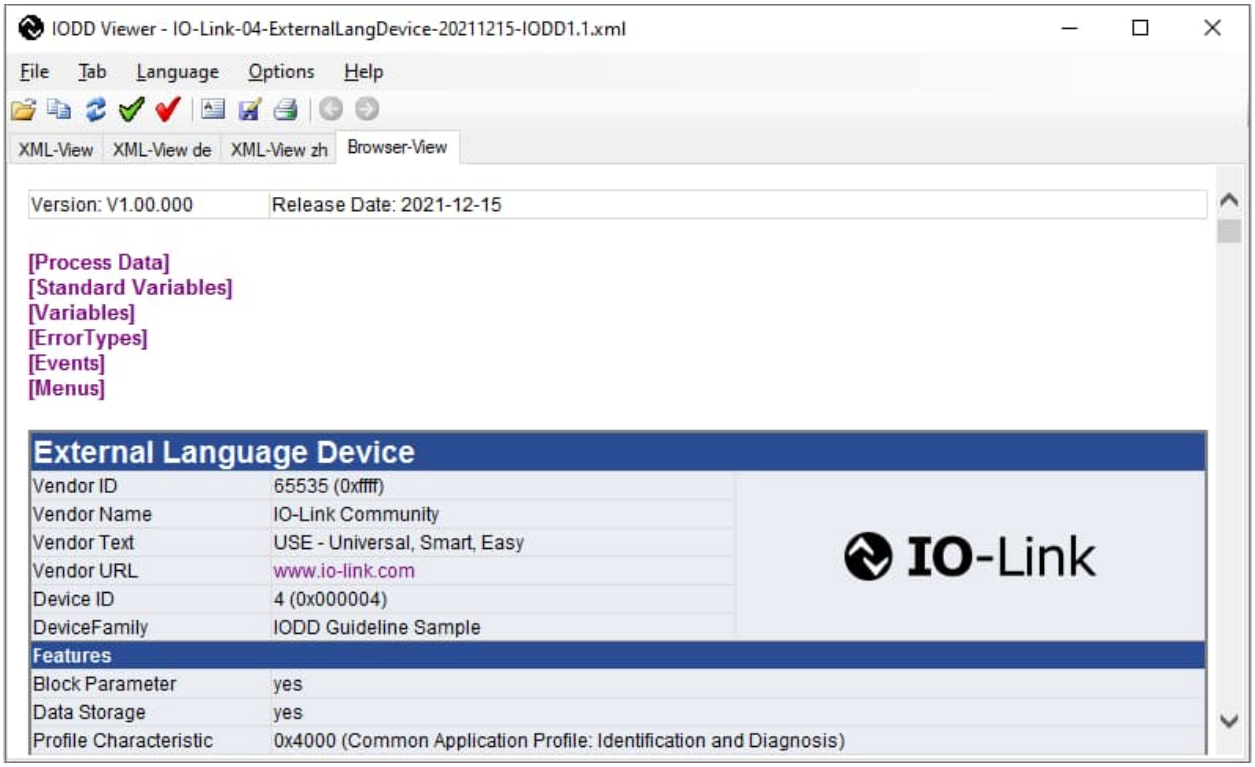
About: Opens the About dialog:



Pressing the Escape or Return key or clicking Close closes the dialog.

Clicking the link to the IO-Link Community's web site opens the standard web browser with this URL.

Behavior with opened IODD:



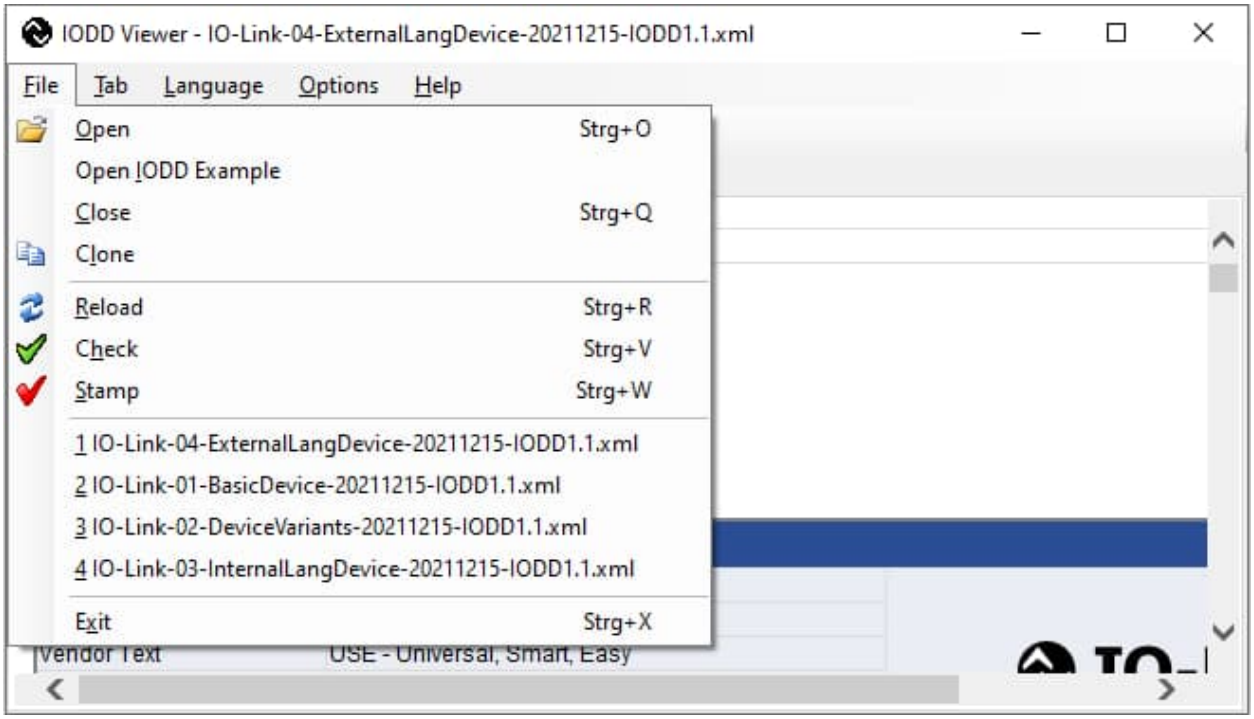
After opening the file two additional menus (Tab und Language) and several tabs appear:

XML-View: XML source of the IODD

XML-View <language code>: XML source of the external text document(s)

Browser-View: The IODD in a human readable form.
If there are page-internal links in this view and you have followed them, the two rightmost buttons in the button strip allow you to navigate back and forth.
External links are opened in the standard web browser.

Menu File:



Open / **Open IODD Example / List of file names**: Closes the currently opened IODD before opening.

Close: Closes the currently opened IODD. The Viewer returns to the state “without opened IODD”.

Clone: Copies the main IODD and the external text documents to a new name. The suggested name is the original name with the date replaced by the current date. If the copy goes to a different directory, the referenced graphics files are copied too (with unchanged file names). Afterwards the current IODD is closed and the copy is opened.

Reload: Closes the currently opened IODD and re-opens it. Useful to see the consequences after modifying the IODD in the XML Editor.

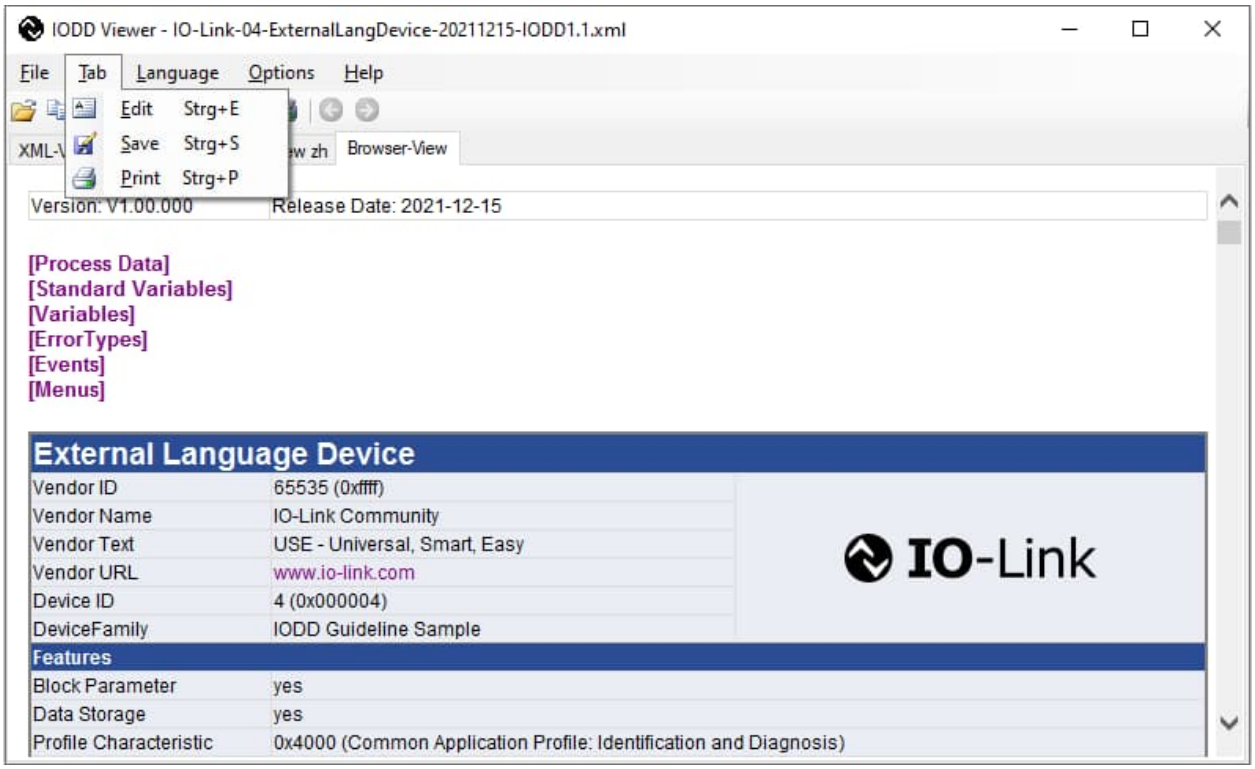
Check: Calls the IODD Checker for this IODD. Uses the command line arguments for checking set in the Options menu. If the check of the main IODD succeeds, the external text documents are checked too.

Stamp: Same as Check, but the IODD is stamped after being checked. The Viewer suppresses the call to the Checker for each file that is read-only. There is no automatic reload.

Exit: Closes the IODD before exiting the program.

Drag-and-drop into one of the XML- or Browser-Views is also possible. Note that because of some technical quirks you can drag any file over the view without getting a no-drop-cursor. Still, only files with extension “.xml” or “.zip” are accepted when dropped.

Menu Tab:



These menu entries always work on the currently selected tab.

Edit: Calls the XML Editor that is entered in the Options menu. The file name associated with the tab, enclosed in double quotes, is handed over as the only command line argument.

- XML-View (main IODD or external text document):
  The displayed XML file is opened in the editor.
- Browser-View:
  The main IODD file is opened in the editor.
- CheckResult:
  Not applicable.

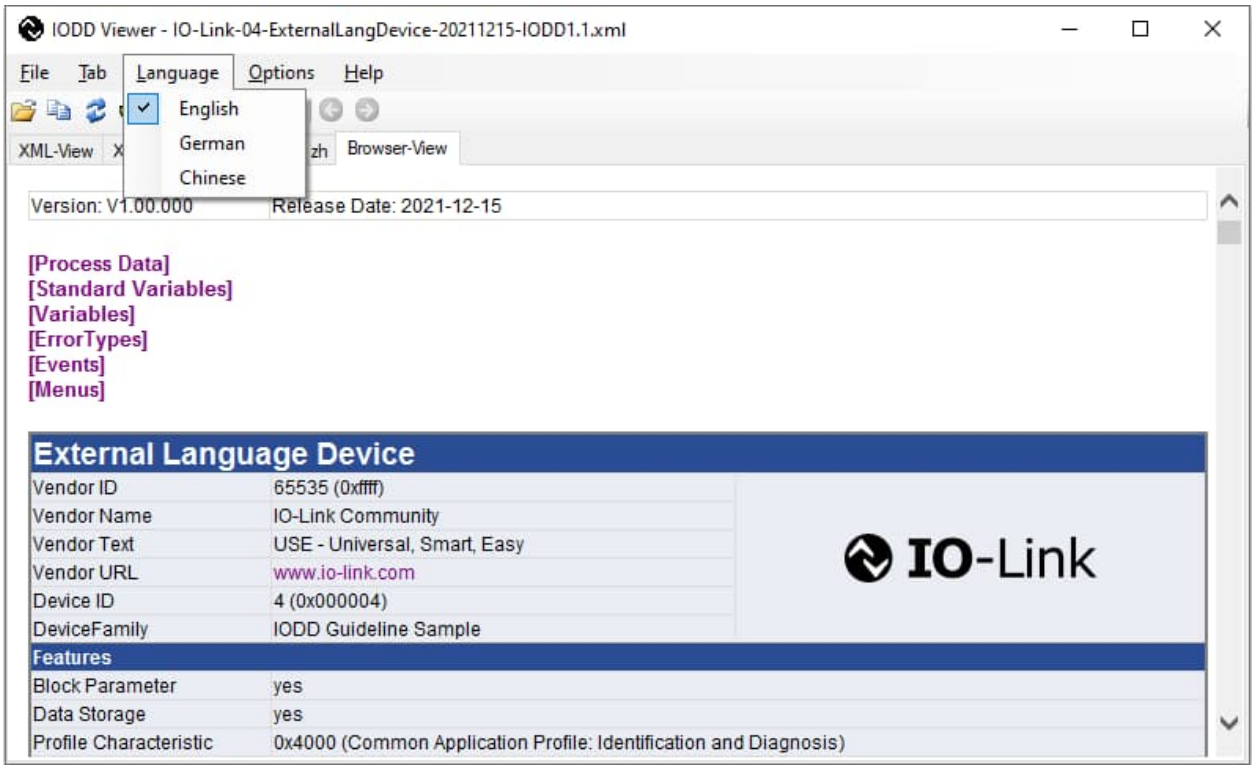
Save: Saves the content of the selected tab.

- XML-View (main IODD or external text document):
  The XML file is saved.
- Browser-View:
  The HTML source is saved. Referenced graphics files are copied to the destination directory, too.
- CheckResult:
  The output of the Checker runs is saved as plain text.

Print: Prints the content of the selected tab.

- XML-View (main IODD or external text document):
  The XML file is printed.
- Browser-View:
  The rendered HTML is printed.
- CheckResult:
  The output of the Checker runs is printed (“naked”, i.e. without headline or page numbers).

Menu Language:



This menu offers a selection of the languages supported by this IODD and its external text documents. Changing the selection renews the Browser-View.

The selected language is saved in the Windows Registry. When opening an IODD, the last used language will be reused, provided this IODD supports this language. Otherwise English (the PrimaryLanguage) will be used.

The menus Options and Help behave identically to the state “without opened IODD”.

Behavior with loaded IODD regarding Check / Stamp:

When clicking Check or Stamp another tab appears:

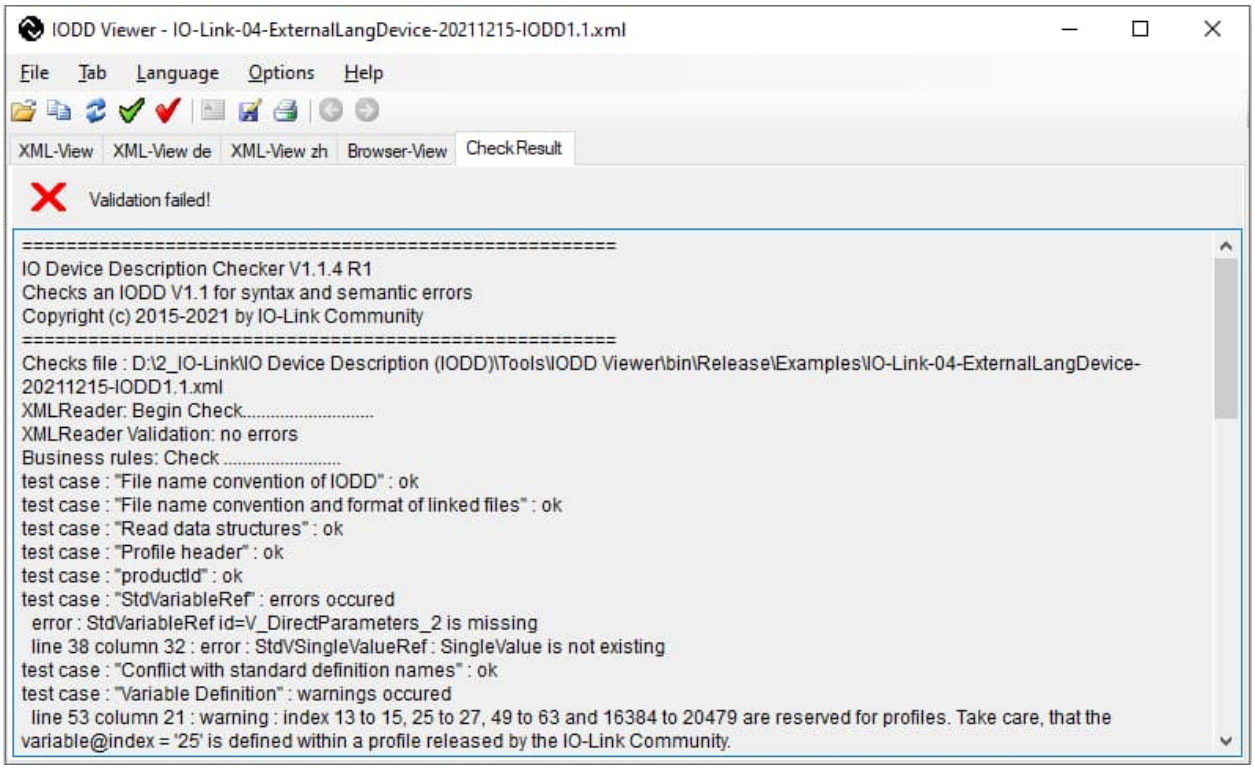
CheckResult: Contains the output of the IODD Checker (standard output as well as standard error output). The result code returned by the Checker after completion controls the display in the headline:

Checker is running:

While the Checker is running its output is updated regularly. In this state, the Viewer reacts to events (e.g. mouse, keyboard) but all menu entries and buttons are disabled except for Exit and Help > Contents.

All Checker runs succeeded:

At least one Checker run returned an error:



In this tab it is possible to mark text with the mouse or Ctrl-A for “mark all” and then copy it to the clipboard with Ctrl-C.

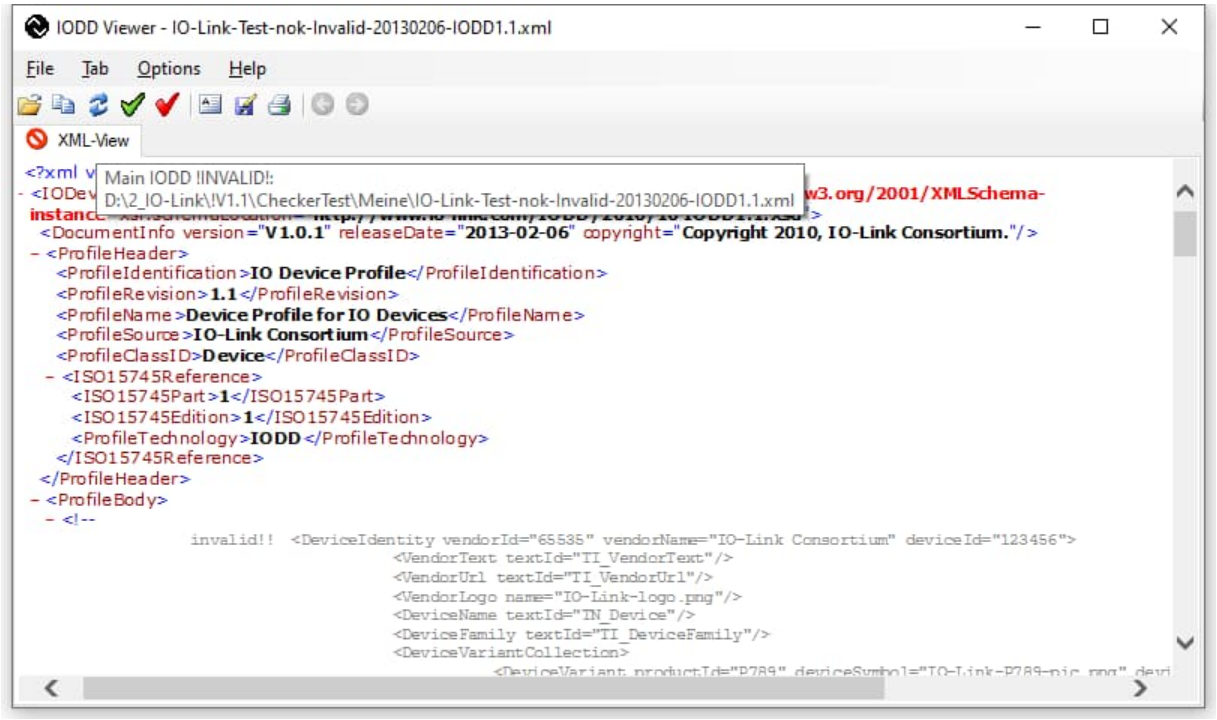
When closing the IODD, opening another IODD or clicking Reload, this tab will be removed.

Behavior with bad files:

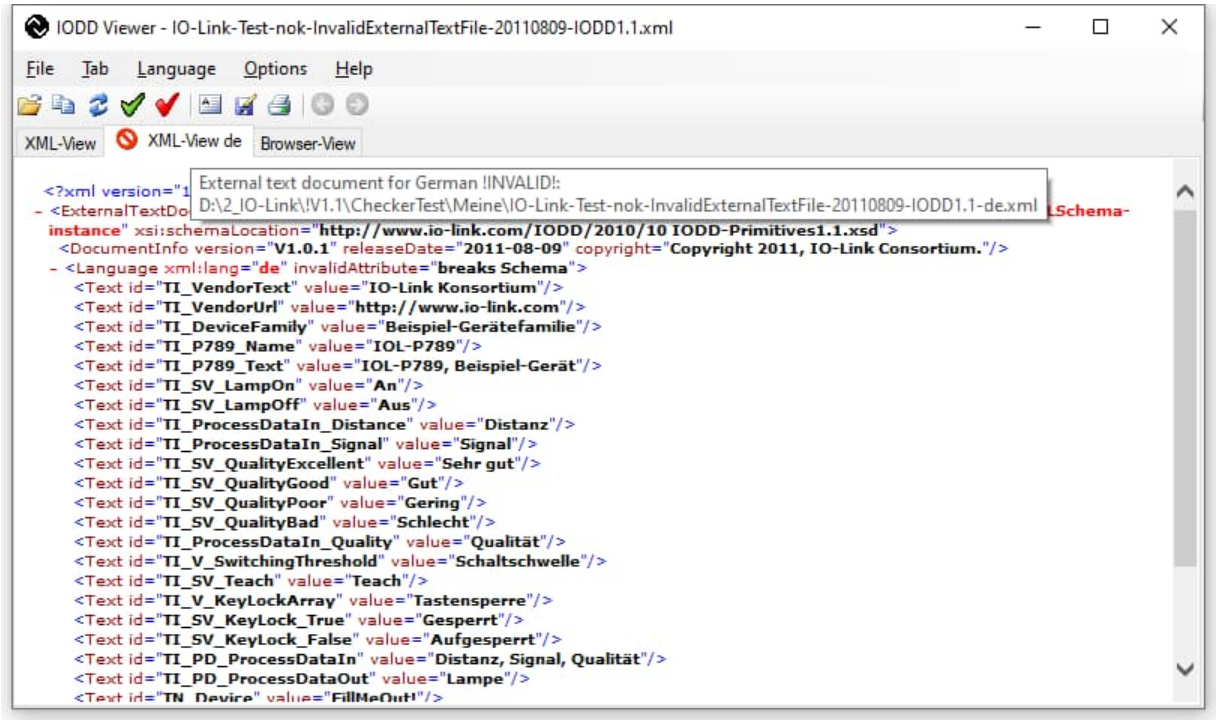
Files that are not well-formed XML cannot be opened. A message “File <name> is not well-formed XML.” will be displayed.

If the file is well-formed, it will be opened. An XML-View tab will appear, the menu Tab will appear, and calling the IODD Checker is possible.

If the main IODD is not valid according to the IODD schema, no Browser-View will appear (i.e. no conversion to HTML takes place) and the Language menu will also not appear. The tab shows a red icon to signal invalidity:



If the main IODD is valid, the Browser-View and the Language menu will appear. If an external text document is invalid according to the IODD schema, its language is not considered in the Language menu. Its XML-View will show a red icon to signal invalidity:



An external text document may be opened independently. But it won't be recognized as part of an IODD and is thus treated like any other well-formed but invalid XML file.

Automatic generation of HTML representation

When an IODD is opened, the Browser-View tab may be saved with Tab > Save. This saves the HTML representation of the IODD content, in the currently selected language. The saved file

can be used to display the Browser-View independent of the IODD Viewer, with just a web browser.

Interactively creating these HTML files for all languages supported by the IODD and its external text documents requires a lot of clicks.

On special request, the IODD Viewer therefore supports automatic generation of HTML files. The input IODD file name is given on the command line, and option “-h” is added. In this mode, the Viewer just creates the HTML files and then exits without opening a window. By default, the created files are put in the same directory as the input IODD but you can change the destination directory with option “-o” and a directory name.

Starting the IODD Viewer from another tool

Tools which want to automatically start the IODD Viewer need the path to the Viewer’s executable file. As the deployment of the tool is in the hands of the user, there is no well-known location. To help tools finding the Viewer, it writes upon each start its executable path to the Registry Key *HKEY_CURRENT_USER\Software\IO-Link Community\IODD Viewer\1.0.0.0\ExecutablePath*.