

# IODED\_V1.1.4\_Checker V1.1.13 R1

## User Manual

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## 1. Introduction:

The IO Device Description (IODE) describes the functionality of a device from the IO-Link point of view. The IODE is required for device engineering of IO-Link devices and is mandatory for every IO-Link device. The IODE Checker is able to check the content of IODE files for IO-Link. It checks the accuracy of the IODE according to the IODE schema and the test specification and stamps the IODE in case of no errors. This helps to build a valid description file and insures interoperability. IODEs are only accepted from IO-Link Engineering Tools when they are checked and stamped with a valid version of this IODE Checker. This is always the latest version and, for a transition period that is determined at the time of release, the previous version.

The check with the valid checker is part of the tests required for the manufacturer declaration. Chapter 8 describes the results output and their meaning in more detail.

Since version V1.1.12, the checker also carries out checks on the implementation of profiles in the IODE. For this purpose, the so-called IODE snippets are used, which are a fixed and binding part of the profile specifications. Due to necessary changes in the IODE snippets, the checker V1.1.12 was withdrawn.

There are snippets for each released profile. The snippets of all released profiles are included in the respective checker. You can find out which profiles are supported and which snippets are included in the checker in the ReadMe for the respective checker version.

The rules for this are described in the IODE Specification V1.1.4 (IO Device Description Specification (with Schemas and Standard Definitions) V1.1.4).

Note to the completeness of test results: Even though the IODE Checker now has a fairly high test depth and uncovers a large number of errors, it still cannot check all special cases. The developer remains responsible for ensuring that the IODE and the device implementation comply with the valid IO-Link Interface, Extensions, Profiles and IODE specifications as well the test specifications.

The tool is provided free of charge by PROFIBUS Nutzerorganisation e.V. (Germany).

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The license conditions for the software are described in the document "IO-Link IODE Checker licence V1.0.pdf" which is included in the checker-download.

## 2. To run this tool, please install

Microsoft .NET Framework Version 4.7.2 Redistributable Package (x86)

Please use the newest updates. It is recommended to use Microsoft Update to get the newest fixes: dotnetfx.exe from <http://www.microsoft.com>

Please unpack archive to a folder of your choice.

In the archive you'll find:

- IODED\_V1.1.4\_Checker\_ReleaseNotes.pdf
- IODED\_V1.1.4\_Checker\_UserManual.pdf
- IODED\_V1.1.4\_Checker.exe (running Windows 10, 11)
- Check.bat (sample batch file)  
please change the installation path of checker  
set CHKPATH="path\IODED\_V1.1.4\_Checker.exe"
- Folder with the schema file for the IODED-Snippets and all released IODED-Snippets.

## 3. Command Line Operation

The checker was intentionally developed as a command line tool so that it can also be called from generation environments. However, only one instance can be running at a time. This must be taken into account when calling.

IODED\_V1.1.4\_Checker <parameter>

- |              |  |
|--------------|--|
| <Filename>   | defines the full pathname of the XML file to be checked  |
| -?           | displays this help   |
| -l<Filename> | defines the full pathname of the log file which contains all messages<br>default: no logfile                   |
| -w           | disables warnings<br>default: enable warnings  |
| -s           | enables to write stamp<br>default: stamp will not be written   |
| -crc         | checks only stamp<br>default: validation and check business rules  |
| -k           | checker waits on key after check<br>default: no wait on key  |
| -p           | enables output test case in spite of positive result<br>default: Output test case only with warnings or errors |

Snippets:

IODED-Snippets-CP.xml  
IODED-Snippets-SSP.xml

IODED-Snippets-BT-FU.xml  
IODED-Snippets-IOLS.xml

Return values:

0 = Ok	Validation ok. Errors with business rules
1 = CheckingError	Validation error. No check of business rules
2 = ValidationError	No check, only help text showed
3 = NotWellFormedError	
4 = Help	
5 = CommandlineError	
6 = AccessDeniedError	
7 = Stamp not valid	Only used with parameter -crc

## 4. Newer version is available

The checker automatically checks whether a newer version is available. Therefore, it needs access to the internet from time to time. It remembers the status and remains functional for another 30 days even without internet access. It receives information from the Internet as to whether a newer version is available and how long the version used can still be used. A warning informs about this. Access is via the following URL:

<http://www.io-link.com/IODED/Checker/IODED-Checker-Versions.xml>

If your firewall does not allow access, please allow the checker to access the specified URL.

## 5. Schema Validation

The checker first checks the conformity of the IODED to the IODED XML schema. This schema check is performed using the .NET framework (4.7.2) parser. After performing the schema validation without errors the business rules checks are performed.

## 6. Business Rules Check

The schema validation is followed by the business rules checks regarding the IODED specification and some specific checks regarding the profiles that cannot be performed by the subsequent profile checks based on the IODED snippets. After performing the business rules checks without error the profile checks based on the profile snippets are performed.

## 7. Profile Checks based on the IODED-Snippets

The implementation of profiles is based on the so-called IODED snippets. There is an IODED snippet file for each IO-Link profile or profile class. The checker from version V1.1.13 on contains all shared IODED snippets. Which IODED snippets are included in the checker is displayed at the beginning of the result output.

The profile test is only carried out if the previous business rules checks have been successfully passed without errors.

When interpreting the error messages in the profile checks, a few things must be considered in order to better understand them.

- As with the business rules checks before, the line number in the IODED will be displayed as a hint if possible. In addition, the line number is now also displayed in the IODED snippets. This sometimes helps to better understand the error messages. To do this, we recommend opening the related IODED snippets in an XML editor in addition to the IODED to be tested.

Sample:

```
line 191 (IODED): error : subelement 2 has wrong position : line 131  
(PrRu) : <Menu id="M_OMSR_CP_Diag_DeviceStatusInfo"
```

Here the location of the error is shown in the IODED and also in the IODED Snippets (PrRu). Depending on the message both references, only one reference or no reference, is shown.

- In the case of business rules checks, each line in the output of the checker stands for itself. In the profile tests, the immediately following lines may contain hints about details of the error. Therefore, you should first look at this before trying to understand and fix the error.
- Make sure that you have correctly specified the profiles and optional function classes that you want to implement in the profileCharacteristics. Otherwise, all entries associated with a profile will be acknowledged as errors.

## 8. Handling the results

After the test, the IODD checker creates the stamp element at the end of the IODD.

```
<Stamp crc="3310665985">
  <Checker name="IODE-Checker V1.1.13 R1" version="V1.1.13.1"/>
</Stamp>
```

In case there were no errors, a CRC != 0 is entered. In case of errors, a CRC = 0.

```
=====
Result of validation and business rules .....
0 errors found
0 'highly recommended' warnings found
1 warnings found
Stamp written
=====
```

- Errors

Deviations from the specification are displayed as error messages. The Stamp@crc is overwritten with 0.

- Highly recommended warnings

Specification requirements that are marked as "highly recommended" must be implemented except in understandable exceptional cases. Since this may limit the system behavior within a system with IO-Link, this should be avoided if possible.

Deviations from "highly recommended" must be described in the user manual and in the manufacturer declaration as an exception. However, highly recommended warnings do not prevent the Stamp@crc from being written.

**Important note:** The wording of the IO-Link specifications follows the IEC. The conventions for „may“, „should“, „shall“ and „highly recommended“ can be found at the beginning of each IO-Link specification.

**highly recommended:** indicates that a feature shall be implemented except for well-founded cases. Vendor shall document the deviation within the user manual and within the manufacturer declaration.

- Warnings

The checker always outputs warning messages when the developer has to check the correctness of the IODD regarding the message and implement it accordingly.

However, warnings do not prevent the Stamp@crc from being written.