



# Easy Creation of EDS Files with EZ-EDS

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# Disclaimer

- This presentation does not talk about the meaning of EDS content and what it is used for.
- Even with an EDS editor like the one described further down, it is possible to create EDSs that contain complete nonsense, even though they might be syntactically correct.
- The use of EZ-EDS does not guarantee syntactically correct EDSs in all cases. The use of the ODVA EDS Authentication Tool (EDS Checker) is still recommended.
- This presentation and the demonstration that follows can only cover the commonly used parts of an EDS.
- The pre-release version I can give you today should only be used until the released version (3.2) will become available on the ODVA website (later this year).

# EDS ⇔ Problems???

## Do you experience problems like this?

Using the correct  
data type

```
Param1 = 0,,, 0x0134,0xC6,1,"Parameter Name",  
        "", "Help String",,,,0,,,,,,,,,;
```

Decoding the  
meaning of the  
descriptor

Getting the  
number of  
commas right

# EDS ⇔ Problems???

Or like this?

Matching path  
with path size

Decoding/encoding  
a path

```
Param1 = 0,8,"21 34 12 25 78 56 30 90",0x0134,0xC6,  
1,"Name","","Help String",,,,0,,,,,,,,,i
```

# EDS ⇔ Problems???

## Or like this?

Understanding 32-bit descriptors?

Understanding 32-bit descriptors?

```
Connection1 = 0x04070002,0x4464040F,,4,,,8,,,,,  
,"Name", "", "20 04 24 64 2C 65 2C 66";
```

Mysteries of  
padded/unpadded paths?

EDS ⇔ ~~Problems~~

## Then EZ-EDS is the tool for you!!!

- Syntactically correct EDS entries, no more counting commas
- Descriptor decoding
- Data type selection in plain English
- Packed/padded path encoding
- Correct spelling of keywords
- Enumeration that matches
- ...and many more features

Best of all: It's

**Free!!!**

# What is an EDS?

- An EDS is an electronic description of all details of a CIP device that are relevant for configuration.
- An EDS is an ASCII file, typically with a file name "name.eds".
- An EDS is structured into several sections containing one or several entries each.
- Sections and entries follow a certain syntax.
- For complete information on EDS details see chapters 7 of the CIP Specification volumes and refer to material published by ODVA.

# Structure of an EDS

- Every EDS is subdivided into sections.
- Every section starts with a section keyword in square brackets [ ].
- No end delimiter for sections; the start of a new section delimits the previous section.
- Sections have one or several entries with the following general format:  
Entry\_keyword = field1,field2,...,fieldN;
- Entries may extend over several lines.
- Comment may be added in many areas.
- Two mandatory sections: [File], [Device], all other sections are optional.

# Example EDS Structure

[File]

```
DescText = "Test EDS with I/O Assemblies";  
CreateDate      = 10-13-2003;  
CreateTime      = 16:00:00;  
Revision = 1.001;
```

[Device]

```
VendCode = 2005;  
VendName = "Test Vendor 2005";  
ProdType = 7;  
ProdTypeStr      = "General Purpose Discrete I/O";  
ProdCode = 123;  
MajRev          = 1;  
MinRev          = 1;  
ProdName = "Test Module I/O Block";  
Catalog        = "2005-Test I/O Block";
```

[IO\_Info]

```
Default          = 0x01;  
PollInfo         = 0x0005,          $ Compatible with COS  
                  1, 1;             $ Default: Input1 and Output1  
COSInfo = 0X0005,          $ Compatible with Poll  
                  2, 2;             $ Default: Input2 and Output2
```

. . .

# Allowed Characters in EDSs and their Use

- All characters in an EDS use the 8-bit ASCII character format as defined by Tables 1 and 2, Row 00 of the IEC/ISO 10646-1.
- Strings are shown in quotation marks.
- A set of String Escape Sequences is defined for the formatting of text strings.
- The “\$” sign has a special meaning; everything behind a “\$” sign is comment (except within a string).
- Certain characters and parts of an EDS are regarded as “white space”, i.e. they have no syntactical meaning.

# Keyword Rules

- **Section and entry keywords follow certain rules.**
- **Publicly defined keywords are described in chapters 7 of the CIP Specification:**
  - ▶ Chapter 7 in CIP Common (Volume 1) contains the universally used keywords.
  - ▶ Chapter 7 in EtherNet/IP (Volume 2) contains the keywords used specifically for EtherNet/IP (currently none beyond CIP Common).
  - ▶ Chapter 7 in DeviceNet (Volume 3) contains the keywords used specifically for DeviceNet.
  - ▶ Chapter 7 in ControlNet (Volume 4) contains the keywords used specifically for ControlNet.
  - ▶ Chapter 7 in Safety (Volume 5) contains the keywords used specifically for Safety Devices.
  - ▶ Chapter 7 in CompoNet (Volume 6) contains the keywords used specifically for CompoNet Devices.
  - ▶ Chapter 7 in Modbus Adaptation (Volume 7) will contain the keywords that will be used specifically for Modbus Devices.
- **Vendor-specific keywords may be created; they have the structure “N\_keyword”, where “N” is the Vendor ID. No white space allowed in entry keywords.**

# EDS Section Sequence Rules

- The [File] and [Device] sections are always the first two sections of an EDS.
- All other publicly defined sections may follow in any sequence.

# EZ-EDS – Easy EDS Creation

## General Features:

- ▶ Windows-based tool, runs on every 32 bit Windows version from Windows 98 onwards.
- ▶ No installation required; unzip and copy to directory of choice.
- ▶ No prerequisite software needed.
- ▶ Reads, creates and modifies EDSs.
- ▶ Five types of EDSs:
  - CompoNet
  - ControlNet
  - DeviceNet
  - EtherNet/IP
  - Generic
- ▶ All types can be either of “Standard” or “Safety” type.
- ▶ Modbus EDS constructs are typically included in EtherNet/IP or Generic EDSs

# EZ-EDS – Further Features (1)

- Creation and deletion of sections, no duplication of sections possible.
- Creation and deletion of entries, no duplication of entries possible.
- Automatic conversion of old parameter data types to new data types.
- Semi-automatic conversion of [EnumPar] section to EnumN entries possible (DeviceNet).
- Automatic or semi-automatic conversion of incorrect entries in some cases.
- Multiple instances of the EZ-EDS tool can be run.
- Copying of Parameter and Connection entries within an EDS and between EDSs of the same type.
- Syntax check while information is entered or before EDS is saved; only syntactically correct EDSs can be saved.

# EZ-EDS – Further Features (2)

- **Fixed, predetermined format of finished EDS (sequence of sections and entries, position of comments).**
- **Bottom-up design of EDS; entries must be created first before they can be used in other entries or sections.**
- **All Descriptor Bits are settable, even if not defined yet.**
- **Creation of vendor-specific section and entries.**
- **Creation of new publicly defined keywords, so EZ-EDS does not have to be upgraded whenever the CIP spec is enhanced. However, only very limited syntax checking is done for these user-created entries (same as for vendor-specific entries).**
- **Public keywords in current version of EZ-EDS based on**
  - ▶ CIP Common Specification (CIP Volume 1), Edition 3.2
  - ▶ DeviceNet Specification (CIP Volume 3), Edition 1.4
  - ▶ ControlNet Specification (CIP Volume 4), Edition 1.1
  - ▶ CIP Safety Specification (CIP Volume 5), Edition 1.3
  - ▶ CompoNet Specification (CIP Volume 6), Edition 1.1
  - ▶ Modbus Adaptation Specification (CIP Volume 7), Draft
  - ▶ EtherNet/IP currently requires no additional keywords beyond what is defined in CIP Common.
- **Since this version (3.2Alpha) was created while newer editions of the specs were being published, a couple of details from the newer versions may already have been included in some cases while some other features of the versions listed may not be implemented yet.**

## **EZ-EDS – Further Features (3)**

- **Support for all EDS details for CIP Safety devices including automatic generation of EDS File CRC.**
- **Support for encoding/decoding of the most common EPATH formats; other formats can be handled “manually”.**
- **EZ-EDS leaves an “EZ-EDS Generated EDS” note in the first line of the EDS .**
- **EDSs may be saved with old (obsolete) or new data types to allow creating and maintenance of EDS that are compatible with old tools in the field.**



# EZ-EDS Demo

# EZ-EDS Availability

- EZ-EDS version 3.0 is available as a free download from the ODVA website
- Go to <http://www.odva.org/default.aspx?tabid=134> and register
- Version 3.2 will be available soon
- Support via [EZ-EDS@odva.org](mailto:EZ-EDS@odva.org)