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# SIPROTEC 5 Application Note

## *SIP5-APN-020:*
## *PIXIT – generation for SIPROTEC 5*

Answers for infrastructure and cities.

# SIPROTEC 5 - Application:
# PIXIT – generation for SIPROTEC 5

## Content

# 1 Application: PIXIT – generation for SIPROTEC 5

## *1.1 Summary*

MICS / PICS description of a SIPROTEC 5 device result in the PIXIT document. This application describes how to download the PICS - documentation from the Internet Download Pool and how to create the MICS – description for a specific device with DIGSI 5. The PIXIT - document was used from Siemens through the Edition 1 and Edition 2 certification process of SIPROTEC 5 devices and was accepted well by the test institute KEMA. It replaces the written SIPROTEC 4 PIXIT documents.

## *1.2* General

PIXIT – files are required for the IEC 61850 description of a device or a device family. PIXIT includes

- PICS (protocol conformance statement) which gives an overview of all supported communication features of a device regarding the implemented IEC 61850 communication services defined in chapter 8-1 of the standard.
- MICS (model implementation conformance statement) which show the IEC 61850 data modeling of a device (e.g. Logical devices, Logical nodes ....) with its data objects and data attributes defined in chapter 7-1 to 7-4 of the standard.

PIXIT files are required for the certification process of a device according IEC 61850 part 10 which check the PIXIT content (IEC 61850 device description) against that what is published from the device Online to a test client (e.g. KEMA test tool). PIXIT are required from experts which want to have a deeper view into the IEC 61850 structure of a device.

For SIPROTEC 4 devices for each device a written PIXIT – documentation exist. If functions are added this description must be manually adopted by the documentation department.

For SIPROTEC 5 another errorless procedure has been defined. The PICS is a written document which can be downloaded from the Internet (see chapter 1.3). MICS is created by DIGSI 5 from the real IEC 61850 data model of a device actually defined for this device with DIGSI 5. Due to that we can add or remove functions (Logical Devices and Logical Nodes) with DIGSI 5 and add new data objects, the MICS always show the real situation of a device regarding its actual IEC 61850 data replica.

## 1.3 Download PICS – description from the Internet

The IEC 61850 protocol features of the whole SIPROTEC 5 device family are described in a PICS – document which is provided for download in the SIPROTEC 5 Download Pool. If protocol features are added or changed, this document will be altered. This document is valid for Edition 1 and Edition 2 of IEC 61850.

For download the document open the URL www.siprotec5.com .On the left side inside your browser you will find the SIPROTEC 5 devices.

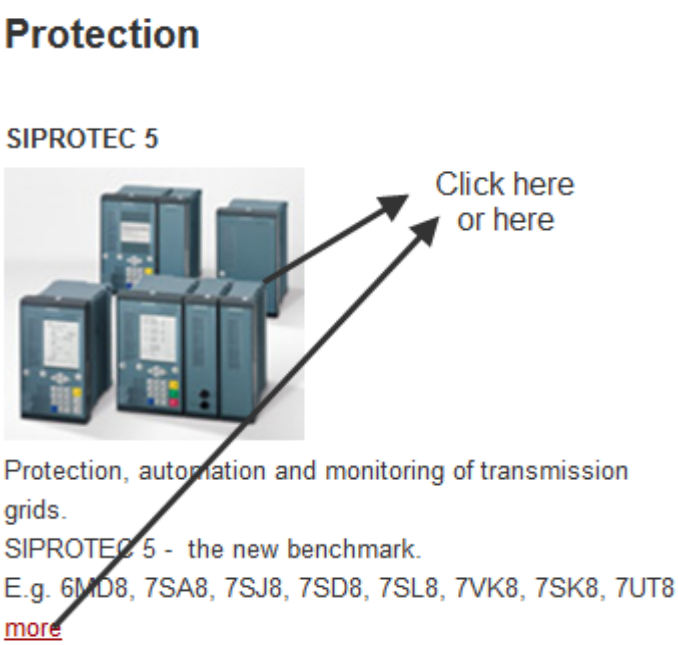



Figure 1: Link from the SIPROTEC main page to the SIPROTEC 5 device information or the SIPROTEC 5 Download Pool

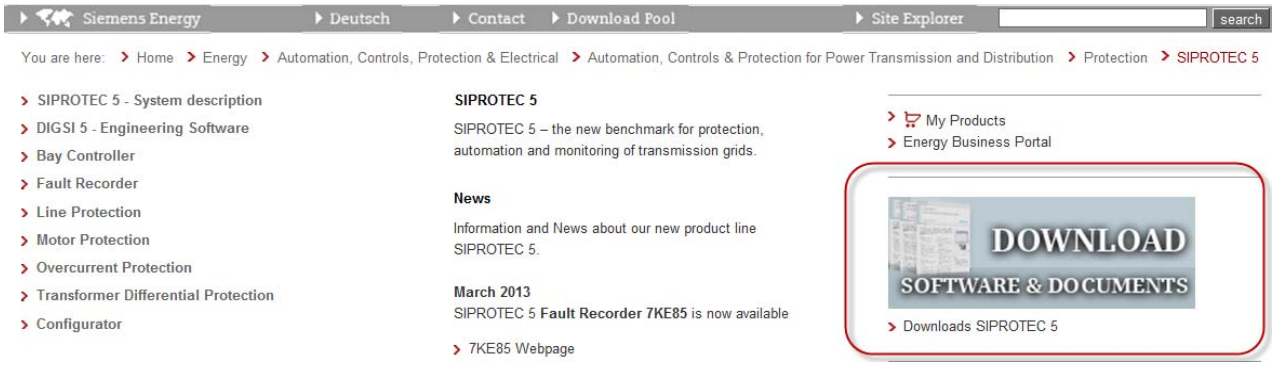



Figure 2: Link to the SIPROTEC 5 Download Pool from the SIPROTEC 5 main page

In order to find the PIXIT file (PICS – file) easier, give in the values according figure 3 into the search masks. PIXIT / PICS document is provided in English language only.

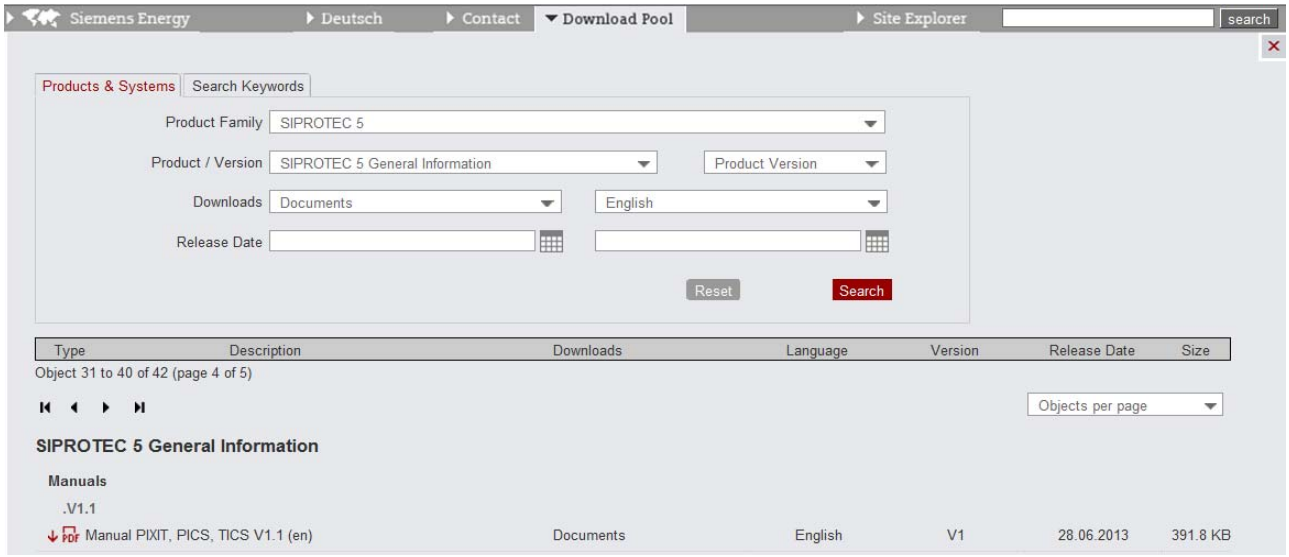



Figure 3: Search mask for documents in the SIPROTEC 5 Download Pool

Download this ´Manual PIXIT, PICS, TICS´ in the actual version (here 1.1) from the Download Pool. It's a PDF – file. TICS (Technical issue conformance statement) are the technical issues discussed and solved in the standardization committee and realized from Siemens before a new version of the standard have been published. They are also included in the document and required for a certification process to describe the actual implementation state of a device regarding that IEC 61850 tissues.

## 1.4 Create MICS – file from DIGSI 5

The next step is to export the MICS files from DIGSI 5. As stated in chapter 1.2 (General) this IEC 61850 modeling is valid for this specific device which you have assigned in DIGSI 5. If you choose an unchanged template e.g. for a 1,5 breaker line protection, the MICS file is valid for this template with all preconfigured functions provided by Siemens. If you add functions and data objects with DIGSI 5, this values will be part of the MICS description straight away.

The MICS – file export is only available if an Ethernet interface as Port J (Integrated Ethernet interface) or an Ethernet module is configured with the IEC 61850 protocol. Click with right mouse on a device from the project and the property page will be opened. Go to ***Export*** and click this entry.

Select the data format ***MICS*** as shown in figure 5. Select a destination as marked in figure 5 and the formatting files. The MICS – file is an XML – file which includes the complete IEC 61850 structure of the device. Two other files will be exported which afterwards allow to format the MICS XML-file with a Browser (e.g. Internet Explorer) to visualize or print out the file without the need to use an XML-editor. It is therefore recommended to export the files into a separate folder (Here as an example c:/Temp/MICS).

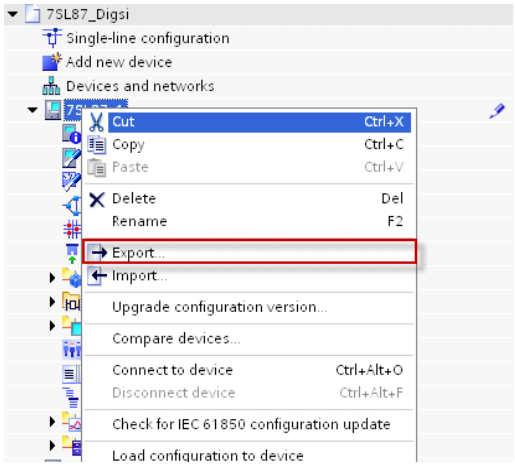



Figure 4: Export features for a selected device in DIGSI 5

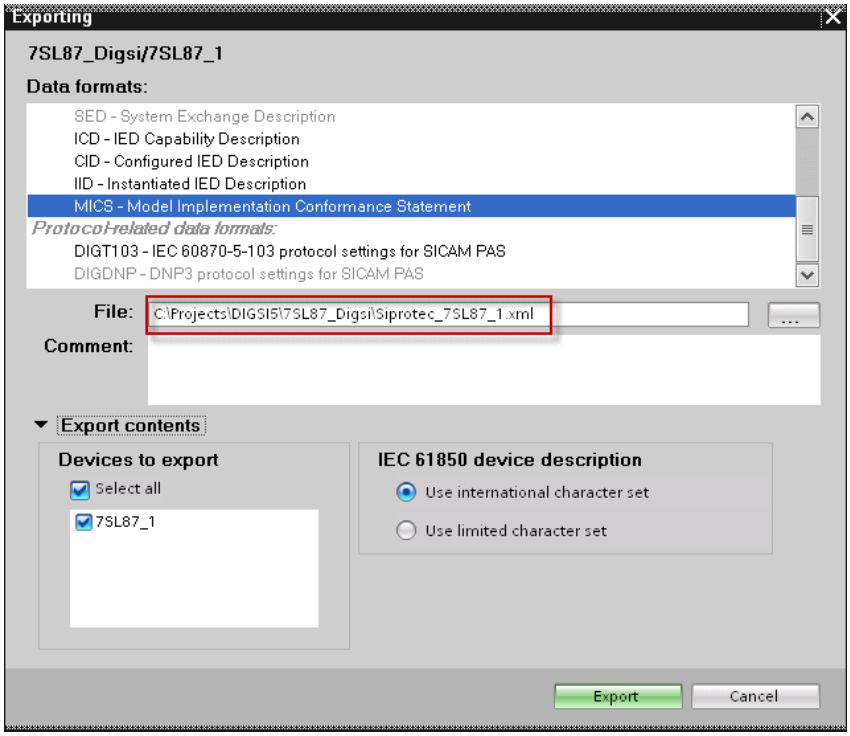



Figure 5: MICS – file export selection and folder selection for the MICS – files

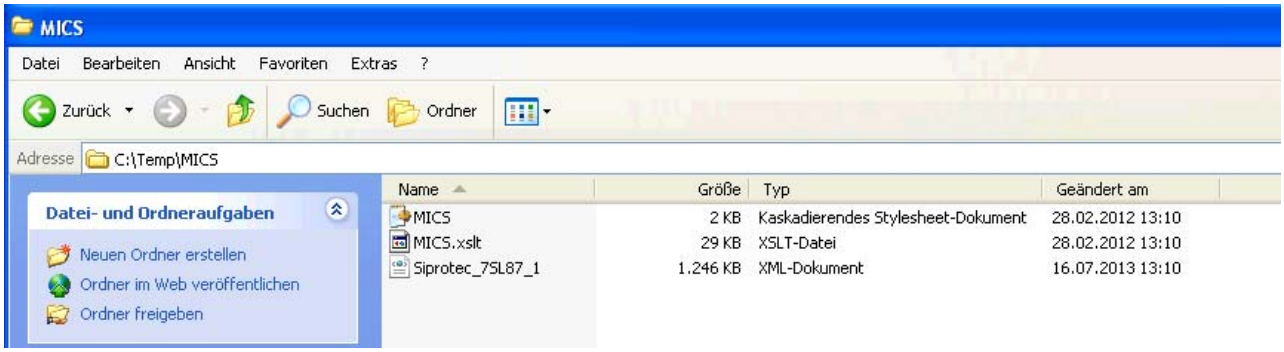



Figure 6: MICS – file (XML – format) and files for formatting the MICS in a Browser (e.g. Internet Explorer)

Open your Internet Explorer. Select a ´file open entry´ and search for the folder where you have stored the MICS file before. For data type use ´All Data´. Otherwise you will only see the HTML – files only and not the MICS XML file. Open the XML – file with the Internet Explorer (recommended).

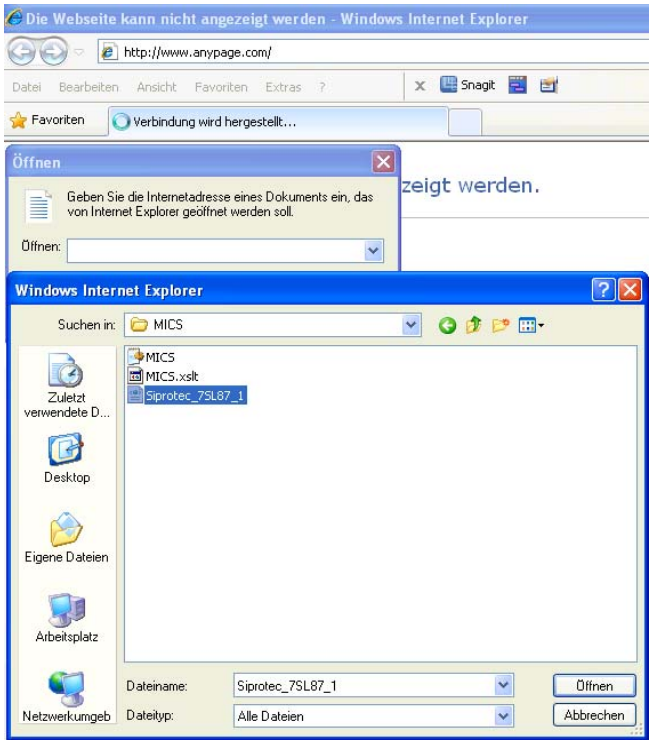
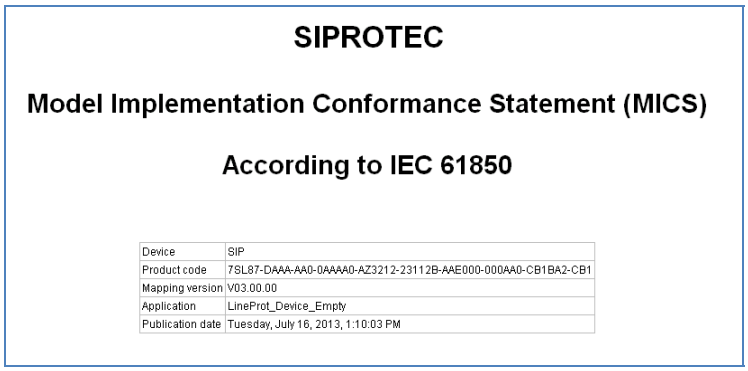



Figure 7: Selection of the MICS – file in the Internet Explorer

Afterwards the start page of the MICS – file will be displayed in the Browser (Figure 8). The following pages show all IEC 61850 Logical Devices and Logical Nodes of this device. From there you can browse into more details by Hyper Links. You can really browse through the complete IEC 61850 data structure of the device and see also all definitions of data objects in the data type template section. The configured GOOSE – connections are also shown. This HTLM – pages can be printed out (e.g. as a PDF – document). Anyway, using the Browser view is much more convenient.



**SIPROTEC**

**Model Implementation Conformance Statement (MICS)**

**According to IEC 61850**

| | |
|---|---|
| Device | SIP |
| Product code | 7SL87-DAAA-AA0-0AAAA0-AZ3212-23112B-AAE000-000AA0-CB1BA2-CB1 |
| Mapping version | V03.00.00 |
| Application | LineProt_Device_Empty |
| Publication date | Tuesday, July 16, 2013, 1:10:03 PM |

Figure 8: Start page of the MICS – file in the Internet Explorer

Finally, the PIXIT / PICS description from the Internet and a print out of the formatted MICS file provide the PIXIT content required for a certification process or requested by customers.

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Siemens AG

Infrastructure & Cities Sector

Smart Grid Division

Humboldtstr. 59

90459 Nuremberg, Germany

Siemens AG

Infrastructure & Cities Sector

Smart Grid Division

Energy Automation

Humboldtstr. 59

90459 Nuremberg, Germany

www.siemens.com/protection

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For more information, please contact
our Customer Support Center.
Tel.: +49 180 524 8437
Fax: +49 180 524 24 71
(Charges depending on provider)
E-mail: support.ic@siemens.com

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