

## Title : Return "invalid file" error after importing CID file into IEDCT

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### Question

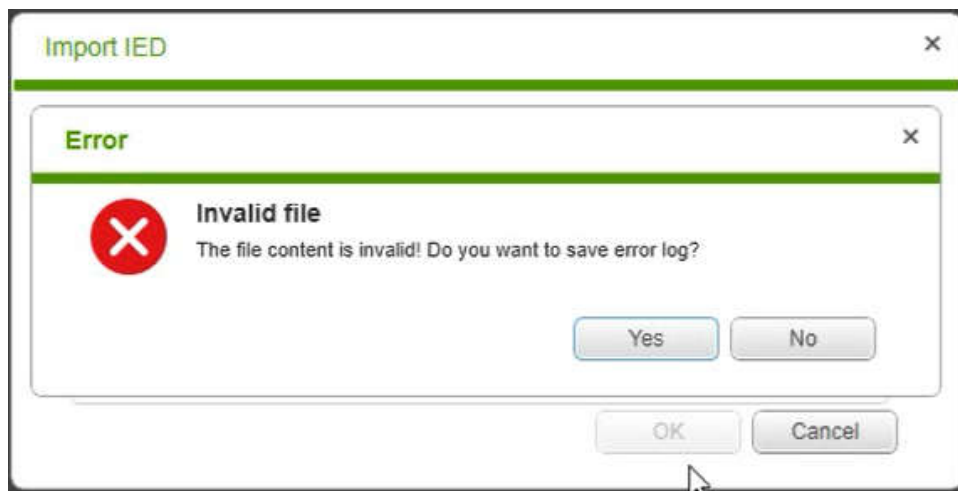
Why IEC61850 module configuration tool (IEDCT) will return "Invalid file" error after importing 3<sup>rd</sup> party device CID/SCD files?

### Answer:

IEC61850 standard defined four kinds of configuration file defining device attribution, including ICD (IED Capability Description), SSD (System Specification Description), SCD (Substation Configuration Description) and CID (Configured IED Description) files. Modicon IEC61850 module configuration tool (IEDCT) parser is fully compliance with IEC61850-6 international standard (Configuration description language for communication in electrical substation related IEDs) and support validate configuration file (ICD/SCD) during import/export or saving.

For mitigate compatibility issues and interoperability capability, all configuration files (CID/SCD) in one system must follow SCL (System Configuration description Language) schema to describe their IED configurations and communication systems according to IEC 61850-5, IEC61850-8-x and IEC 61850-7-x. Otherwise, invalid configuration will lead IEC61850 system including our Modicon IEC61850 module running under abnormal behavior.

For preventing unexpected behavior caused by invalid configuration file, IEDCT will pop-up an error message and generate an error log files after detecting mistake from CID/SCD files. (see below as example).



But sometimes, IEDCT will still allow to import CID/SCD files but may lead some unexpected behavior. This situation should be analyzed case by case. Normally it's caused by some abnormal/unsupported

parameters or Schneider Electric private requirements. IEDCT cannot identify all abnormal parameters in configuration file but will continuously improve "compatibility check" to provide more error logs after importing/saving invalid files. Before that, customer need to self-validate (e.g. by FAQ, by IEDScout) or consult with 3<sup>rd</sup> vendor first when observe such error, then manually correct their ICD/SCD files and import to IEDCT again. The purpose of this FAQ is to list typical issues and guide customer to perform self-validation.

Below are some typical examples for some unexpected behaviors caused by invalid/abnormal ICD/SCD files.

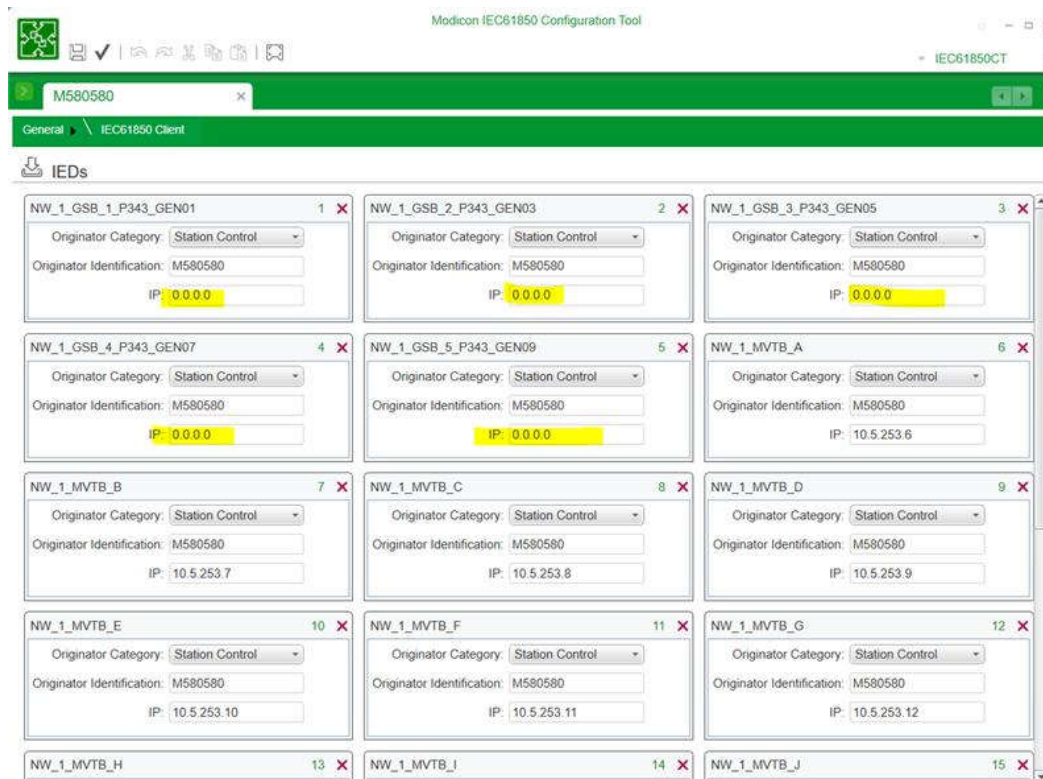
## 1. Issues

### 1.1 IP Address 0.0.0.0 issue (PEP0620530R)

**Analysis:** Sometimes customer is setting the IP address of the Client IED on the BMENOP0300 at 0.0.0.0

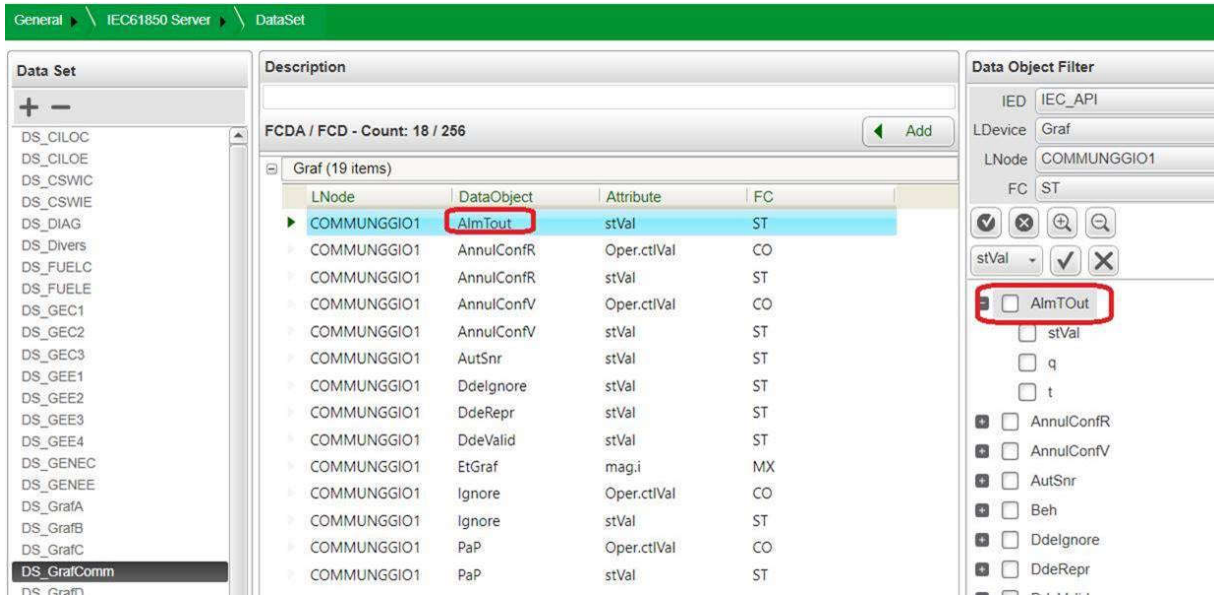
This IP address must not be set on a client IED inside the Configurator Tool because it's causing some delay on GI answering and on sending report by DataChange.

**Resolution:** It's caused by abnormal parameters. Customer must not set the IP address at 0.0.0.0. (see below)



## 1.2 Not all variables are present in IEDCT(PEP0611254R)

**Analysis:** Customers raised some issues regarding NOP server report function not working properly. Some variables are not presented in IEDCT after importing CID files. In this case, it is caused by capital/lowercase letter issue. In deeply analyze their CID file, there is "Alm<sub>out</sub>" DO in "DS\_GrafComm" Data set but "Alm<sub>Out</sub>" in Data Model (see below). Similar mistake found in lots places in their CID file. IEDCT will lost these parameters due to different name (case sensitive)



LNode	DataObject	Attribute	FC
COMMUNGGIO1	AlmTout	stVal	ST
COMMUNGGIO1	AnnulConfR	Oper.ctlVal	CO
COMMUNGGIO1	AnnulConfR	stVal	ST
COMMUNGGIO1	AnnulConfV	Oper.ctlVal	CO
COMMUNGGIO1	AnnulConfV	stVal	ST
COMMUNGGIO1	AutSnr	stVal	ST
COMMUNGGIO1	DdeIgnore	stVal	ST
COMMUNGGIO1	DdeRepr	stVal	ST
COMMUNGGIO1	DdeValid	stVal	ST
COMMUNGGIO1	EtGraf	mag.i	MX
COMMUNGGIO1	Ignore	Oper.ctlVal	CO
COMMUNGGIO1	Ignore	stVal	ST
COMMUNGGIO1	PaP	Oper.ctlVal	CO
COMMUNGGIO1	PaP	stVal	ST

e.g. This is the "DS\_GrafComm" dataset definition in cid, the fourth line "AlmTout" is illegal, so it cannot be shown in IEDScout screen.

```
<DataSet name="DS_GrafComm" desc="">
<FCDA ldInst="Graf" prefix="COMMUN" lnClass="GGIO" lnInst="1" doName="DdeIgnore" daName="stVal" fc="ST" />
<FCDA ldInst="Graf" prefix="COMMUN" lnClass="GGIO" lnInst="1" doName="DdeRepr" daName="stVal" fc="ST" />
<FCDA ldInst="Graf" prefix="COMMUN" lnClass="GGIO" lnInst="1" doName="DdeValid" daName="stVal" fc="ST" />
<FCDA ldInst="Graf" prefix="COMMUN" lnClass="GGIO" lnInst="1" doName="AlmTout" daName="stVal" fc="ST" />
<FCDA ldInst="Graf" prefix="COMMUN" lnClass="GGIO" lnInst="1" doName="TpsAvTout" daName="mag.i" fc="MX" />
<FCDA ldInst="Graf" prefix="COMMUN" lnClass="GGIO" lnInst="1" doName="ETGraf" daName="mag.i" fc="MX" />
<FCDA ldInst="Graf" prefix="COMMUN" lnClass="GGIO" lnInst="1" doName="AutSnr" daName="stVal" fc="ST" />
<FCDA ldInst="Graf" prefix="COMMUN" lnClass="GGIO" lnInst="1" doName="AnnulConfR" daName="oper.ctlVal" fc="CO" />
<FCDA ldInst="Graf" prefix="COMMUN" lnClass="GGIO" lnInst="1" doName="AnnulConfR" daName="stVal" fc="ST" />
<FCDA ldInst="Graf" prefix="COMMUN" lnClass="GGIO" lnInst="1" doName="AnnulConfV" daName="oper.ctlVal" fc="CO" />
<FCDA ldInst="Graf" prefix="COMMUN" lnClass="GGIO" lnInst="1" doName="AnnulConfV" daName="stVal" fc="ST" />
<FCDA ldInst="Graf" prefix="COMMUN" lnClass="GGIO" lnInst="1" doName="Ignore" daName="oper.ctlVal" fc="CO" />
<FCDA ldInst="Graf" prefix="COMMUN" lnClass="GGIO" lnInst="1" doName="Ignore" daName="stVal" fc="ST" />
<FCDA ldInst="Graf" prefix="COMMUN" lnClass="GGIO" lnInst="1" doName="Reprise" daName="oper.ctlVal" fc="CO" />
<FCDA ldInst="Graf" prefix="COMMUN" lnClass="GGIO" lnInst="1" doName="Reprise" daName="stVal" fc="ST" />
<FCDA ldInst="Graf" prefix="COMMUN" lnClass="GGIO" lnInst="1" doName="Valid" daName="oper.ctlVal" fc="CO" />
<FCDA ldInst="Graf" prefix="COMMUN" lnClass="GGIO" lnInst="1" doName="Valid" daName="stVal" fc="ST" />
<FCDA ldInst="Graf" prefix="COMMUN" lnClass="GGIO" lnInst="1" doName="PAP" daName="oper.ctlVal" fc="CO" />
<FCDA ldInst="Graf" prefix="COMMUN" lnClass="GGIO" lnInst="1" doName="PAP" daName="stVal" fc="ST" />
</DataSet>
```

DS LLN0.DS_GrafComm			
Name			Value
DA Graf/COMMUNGGIO1.DdeIgnore.stVal	[ST]		false
DA Graf/COMMUNGGIO1.DdeRepr.stVal	[ST]		false
DA Graf/COMMUNGGIO1.DdeValid.stVal	[ST]		false
DA Graf/COMMUNGGIO1.TpsAvTout.mag.i	[MX]		0
DA Graf/COMMUNGGIO1.ETGraf.mag.i	[MX]		0
DA Graf/COMMUNGGIO1.AutSnr.stVal	[ST]		false
DA Graf/COMMUNGGIO1.AnnulConfR.Oper.ctlVal	[CO]		false
DA Graf/COMMUNGGIO1.AnnulConfR.stVal	[ST]		false
DA Graf/COMMUNGGIO1.AnnulConfV.Oper.ctlVal	[CO]		false
DA Graf/COMMUNGGIO1.AnnulConfV.stVal	[ST]		false
DA Graf/COMMUNGGIO1.Ignore.Oper.ctlVal	[CO]		false
DA Graf/COMMUNGGIO1.Ignore.stVal	[ST]		false
DA Graf/COMMUNGGIO1.Reprise.Oper.ctlVal	[CO]		false
DA Graf/COMMUNGGIO1.Reprise.stVal	[ST]		false
DA Graf/COMMUNGGIO1.Valid.Oper.ctlVal	[CO]		false
DA Graf/COMMUNGGIO1.Valid.stVal	[ST]		false

**Resolution:** It's caused by invalid CID files. Customer must make sure the object name in whole CID/SCD file should keep consistency. IEDCT is case sensitive tool and recommended customer to check and fix similar mistakes in their CID/SCD files.

### 1.3 EXT\_NOP0300\_Goose\_status\_not\_stable (PEP0612394R)

**Analysis:** Customer reported an issue on Goose status is not stable. IEC61850 module cannot get correct IED device healthy status. After R&D investigation, customer's CID file doesn't define "MinTime" parameter for Goose Control Block. In this case, after customer download configuration into NOP module, firmware will use fixed default Min/Max time (10ms/1s) instead. For customer application, such default value for Goose Control Block will lead unstable behavior of Goose.

```

22 | <GSE cbName="gcb1" IdInst="Relay">
23 |   <Address>
24 |     <P type="MAC-Address">01-0C-CD-01-00-00</P>
25 |     <P type="APPID">0001</P>
26 |     <P type="VLAN-ID">000</P>
27 |     <P type="VLAN-PRIORITY">4</P>
28 |   </Address>
29 |   <MaxTime multiplier="m" unit="s">20000</MaxTime>
30 |   <MinTime multiplier="m" unit="s">100</MinTime>
31 | </GSE>

```

**Resolution:** It's caused by unsupported parameters. IEDCT must read both parameters together, otherwise IEDCT will regard these parameters as "invalid". And for format requirement, The minimum time <MinTime> should be define above the <MaxTime>.After add <MinTime> line and adjust order of these two parameters, the CID can be imported and Goose works properly.

```

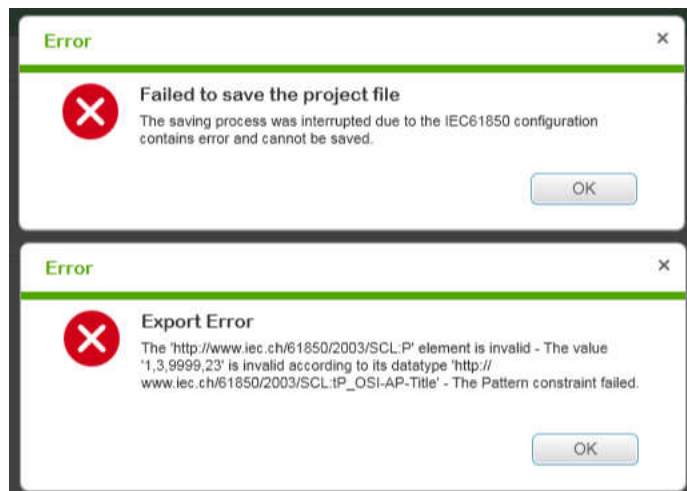
</Address>
<MinTime multiplier="m" unit="s">100</MinTime>
<MaxTime multiplier="m" unit="s">20000</MaxTime>
</GSE>

```

In this case, new firmware will increase compatibility capability. For future unknown cases, we recommend customers to check parameters and compare difference between NOP and 3rd part devices.

### 1.4 CID file error at import in IEDCT v3.0 IR6

**Analysis:** Customer cannot save project after importing 3rd part CID file into IEDCT, it will pop-up below issue/message.



According to error message above, IEDCT parser cannot support certain element when apply this datatype.

**Resolution:** It's caused by unsupported attribute. Remove this "OSI-AP-Title" title from CID file according to error message.

### 1.5 Returns invalid file error after importing AB CID file (PEP0628898R)

**Analysis:** End user applied their private namespace which IEDCT cannot recognize.

```

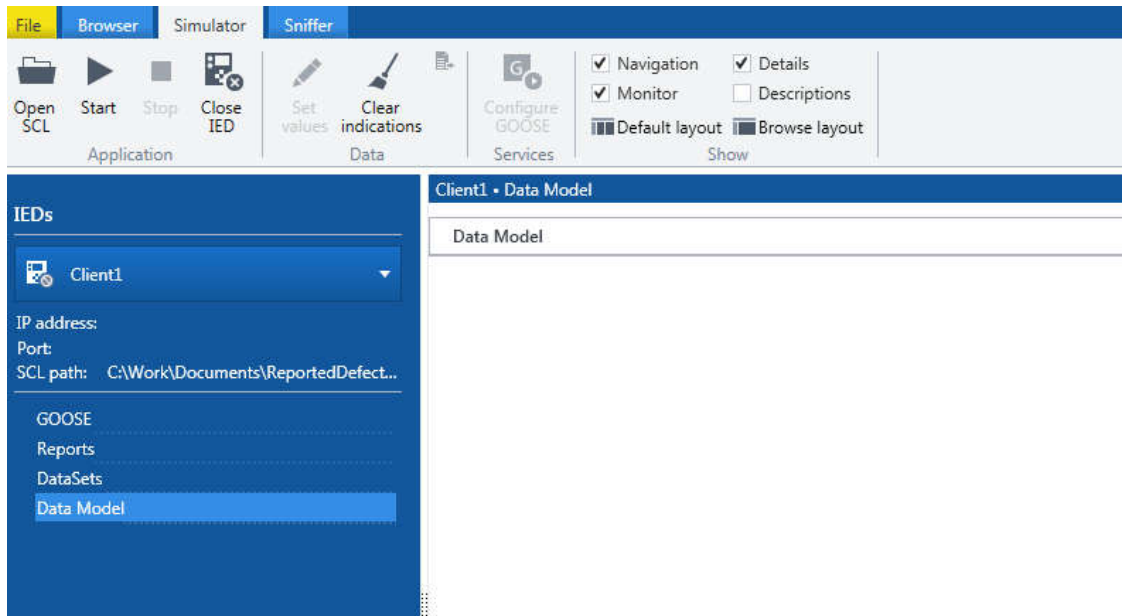
<?xml version="1.0" encoding="utf-8"?>
<!--Generated with ABB IEC61850 Libraries 5.5.0.214 at 11/11/2020 09:16:23.-->
<SCL xmlns="http://www.iec.ch/61850/2003/SCL" xmlns:sxy="http://www.iec.ch/61850/2003/SCLcoordinates"
xmlns:eComm="http://www.abb.com/61850/2015/SCL_ABBCommunication" xmlns:eABB="http://www.abb.com/61850/2010/ABBTranslations"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://www.iec.ch/61850/2003/SCL SCL.xsd
http://www.iec.ch/61850/2003/SCLcoordinates SCL_Coordinates.xsd http://www.abb.com/61850/2015/SCL_ABBCommunication SCL_ABBCommunication.xsd
http://www.abb.com/61850/2010/ABBTranslations SCL_ABBTranslations.xsd" version="2007" revision="B" release="2">

```

Compared with standard CID file, their CID contained too much namespace not following regular CID file. After removing these private namespaces in CID file, IEDCT can import without any error.

```
<SCL xmlns="http://www.iec.ch/61850/2003/SCL" xmlns:sxy="http://www.iec.ch/61850/2003/SCLcoordinates"
xmlns:eComm="http://www.abb.com/61850/2015/SCL_ABBCommunication" xmlns:eABB="http://www.abb.com/61850/2010/ABBTranslations"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://www.iec.ch/61850/2003/SCL SCL.xsd" version="2007" revision="B"
release="2">
```

One way we can check this issue is through IEDScout. We can see that after importing the customer's cid into IEDScout, the Data Model, Dataset, Reports, Goose are all empty:



So user can use IEDScout to verify their CID file firstly.

**Resolution:** It's caused by CID not following standard and used private namespace. Removing these elements can solve this issue.

## 2. Product Line

BMENOP0300(C)

## 3. Environment

Control Expert version 14.1

IEC61850 CT version 3.2

BMENOP0300 firmware version 2.3

#### 4. Resolution

Once IEDCT identified an invalid CID/SCD file during importing/saving, customer should contact 3<sup>rd</sup> vendor and make sure their CID /SCD files following IEC61850 standard and schema should be rigorous. On another hand, IEDCT will continuously improve its "compatibility check" in its parser and will provide necessary message to help customer debug.

IEDScout is a 3<sup>rd</sup> party testing software which can assist customer to debug IEC61850 devices. For detailed information about this tool, please refer their web page below:



<https://www.omicronenergy.com/en/products/iedscout/>