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**Development of an IEC 61850 conformant interface
for small automation devices**

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Overview

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2. Concept: Basic Functions and Extensions
3. Input-Module (Basic Functions)
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 - 3.3 Communication Services
 - 3.4 Mapping of Data
4. Extensions
5. Summary

1. Target groups for IEC 61850



Heinrich-Wertel-Schule
für Elektrotechnik
in Kempten
Kempten/Weingarten University

Prof. Dr.-Ing. H. Frank

A. Vendors:

- Conventional substation automation: few big companies
- DER: few big and many small companies

B. Users:

- Conventional substation automation: few big companies
- DER: few big and many small companies

C. Research Institutes, Universities



To achieve a high acceptance in the market, a good support for all target groups is required for learning IEC 61850 !

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1. Requirements for Learning IEC 61850



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We have:

- ✓ standard IEC 61850
- ✓ training courses
- ✓ collection of many publications
- ✓ Users Group: UCA IUG (The Utility Communications Architecture International Users' Group)

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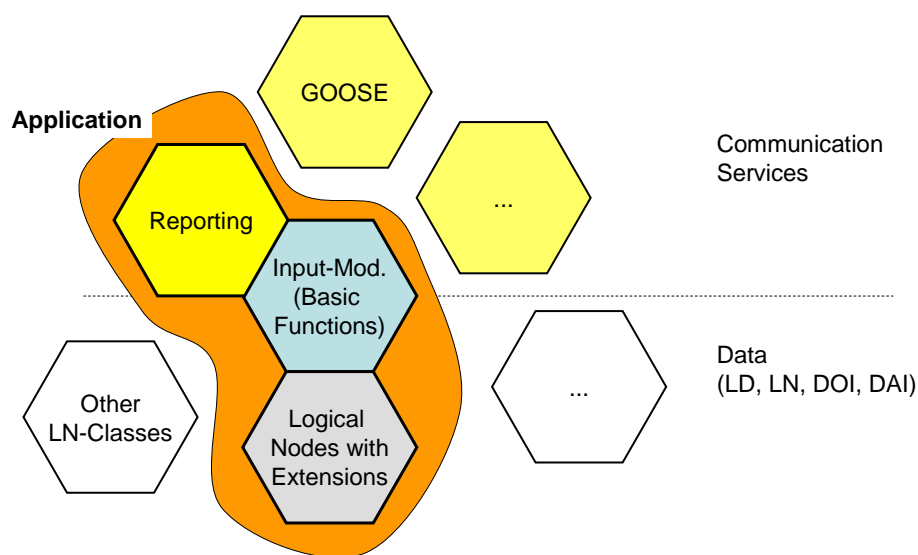
1. Requirements for Learning IEC 61850



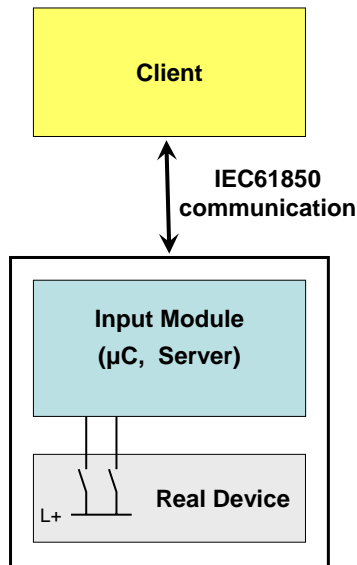
We would like to have:

- ? a reference book for using the IEC 61850 with the following content:
 - > basic overview for the application of IEC 61850
 - > sequence of steps that one has to follow (e.g. SCL, comm., mapping)
 - > simple examples for standard applications
 - > realization of different applications
- ? a training-kit with
 - > a simple, universal example (client and server)
 - > a concrete SCL-file, mapping, communication-protocol
- ? a list of available products:
 - > Devices,
 - > Application Software (Comm. Stacks, ... , SCADA),
 - > Tools.

2. Concept: Basic Functions and Extensions

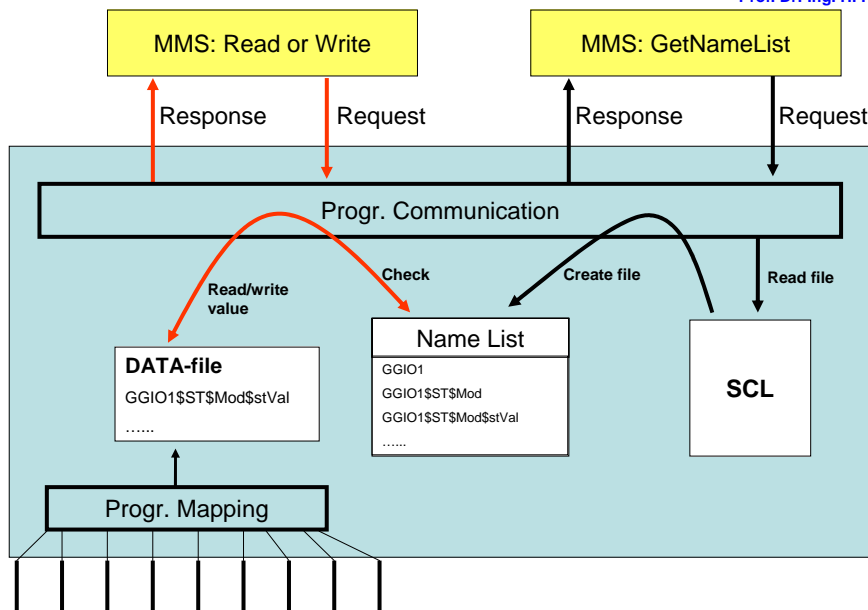


3.1 Input-Module: Hardware



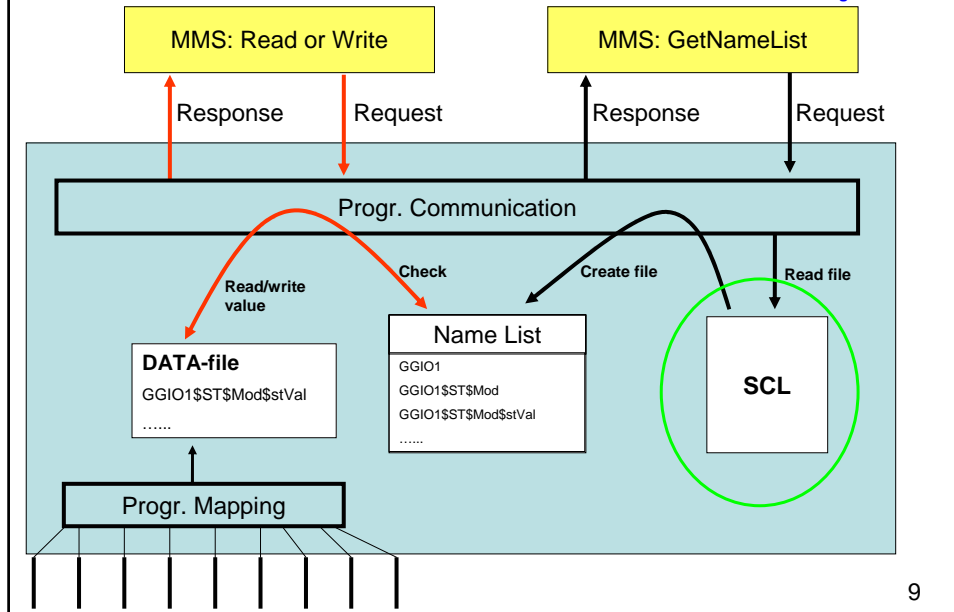
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3.1 Input-Module: Functions



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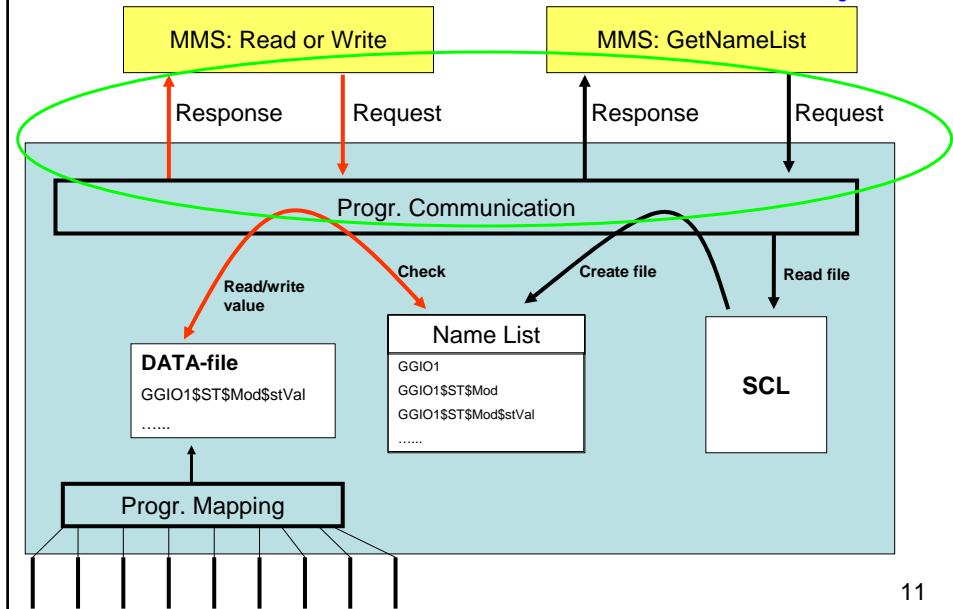
3.2 Input-Module: SCL for Basic Functions



3.2 Input-Module: Data Attributes

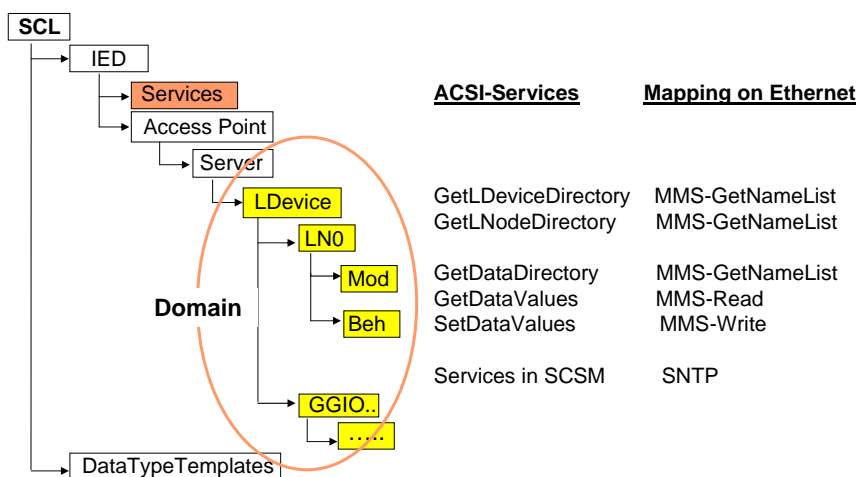
	<u>LN</u>	<u>InClass</u>	<u>Data</u>	<u>CDC</u>	<u>data attributes</u>
LDevice inst = „InMoRWH“	LN0	LLN0	Mod	INC	stVal, q, t, ctIModel
			Beh	INS	stVal, q, t
			Health	INS	stVal, q, t
			NamPit	LPL	vendor, swRev, d
	LPHD1	LPHD	Mod	INC	stVal, q, t, ctIModel
			Beh	INS	stVal, q, t
			Health	INS	stVal, q, t
			NamPit	LPL	vendor, swRev, d
	GGIO1	GGIO	Mod	INC	stVal, q, t, ctIModel
			Beh	INS	stVal, q, t
			Health	INS	stVal, q, t
			NamPit	LPL	vendor, swRev, d
Ind			SPS	stVal, q, t	
GGIO2	GGIO	...			

3.3 Input-Module: Communication Services



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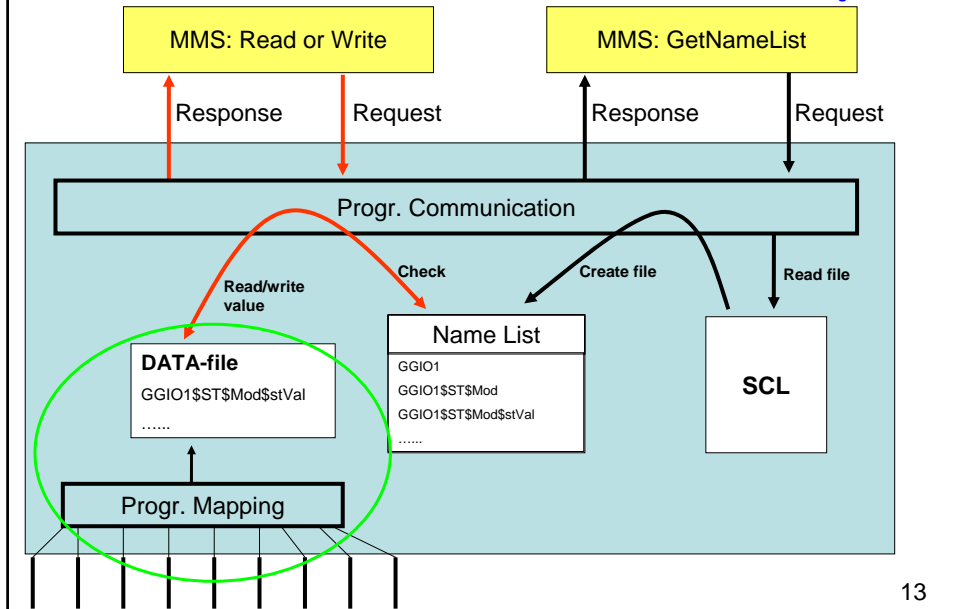
3.3 Input Module: Communication-Services



ACSI – Abstract Communication Service Interface

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3.4 Input-Module: Mapping of Data



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3.4 DAIs: "Mode" and "Behaviour"

Data file:

```

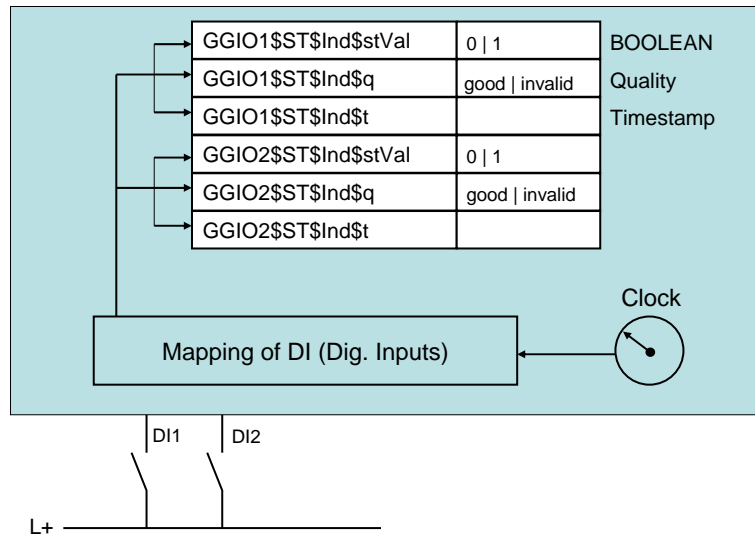
...
LN0$ST$Mod$stVal
LN0$ST$Mod$q
LN0$ST$Mod$t
...
GGIO1$ST$Mod$stVal
...
GGIO1$ST$Beh$stVal
...
    
```

Mod\$stVal in LN0	Mod\$stVal in GGIO1	Beh\$stVal in GGIO1
on (1)	on (1)	on (1)
on (1)	off (5)	off (5)
off (5)	on (1)	on (5)
off (5)	off (5)	off (5)

LNMode XXXX.Mod	LDMode LN0.Mod	LNBeh (read only) XXXX.Beh	LNBeh Value
on	on	on	1
on	blocked	blocked	2
on	test	test	3
on	test-blocked	test-blocked	4
on	off	off	5
blocked	on	blocked	2
blocked	blocked	blocked	2
blocked	test	test-blocked	4
blocked	test-blocked	test-blocked	4
blocked	off	off	5
test	on	test	3
test	blocked	test-blocked	4
test	test	test	3
test	test-blocked	test-blocked	4
test	off	off	5
test-blocked	on	test-blocked	4
test-blocked	blocked	test-blocked	4
test-blocked	test	test-blocked	4
test-blocked	test-blocked	test-blocked	4
test-blocked	off	off	5
off	on	off	5
off	blocked	off	5
off	test	off	5
off	test-blocked	off	5
off	off	off	5

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3.4 DAIs “General Indication”



4. Extensions

