mobile vision

software company

movi

Enabling Mobile Technologies on IEC61850

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About us

Movi Software S.A.S.

▶ We are a software company specialized in electric sector. We know about Standards, we know about Technology.

CEO - Juan Camilo Cardona Graciano

Electronic Engineer graduated from Universidad de Antioquia with experience implementing information systems for utilities, and developing software based on standards communications protocols.

"The best way to predict the future is to invent it" – Steve Jobs
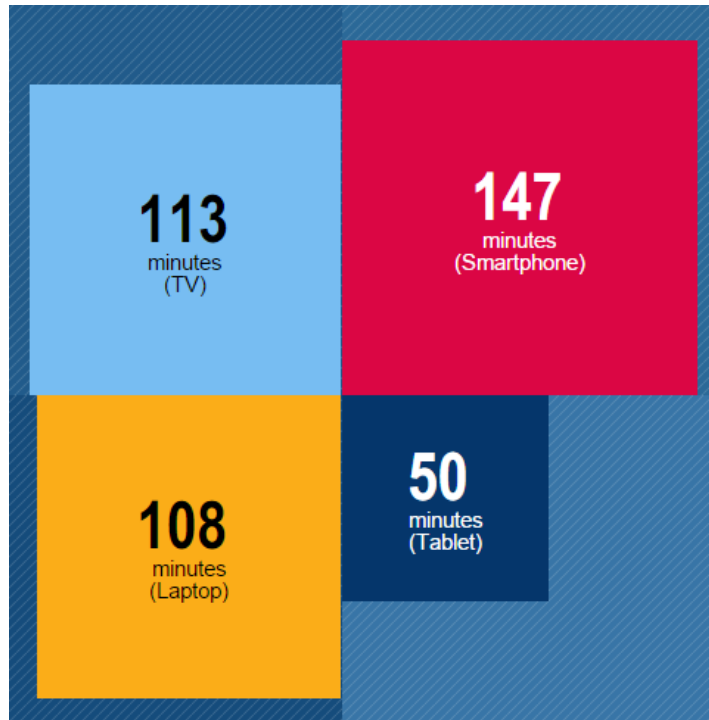
Partnership

Ingeniería Especializada (IEB S.A)

- Ingeniería Especializada S.A. (IEB S.A.) is a consulting firm specializing in Electrical and Civil Engineering. For over 25 years, our focus has been to build strong relationships with our clients and to provide them with optimal engineering solutions based on knowledge and client support.
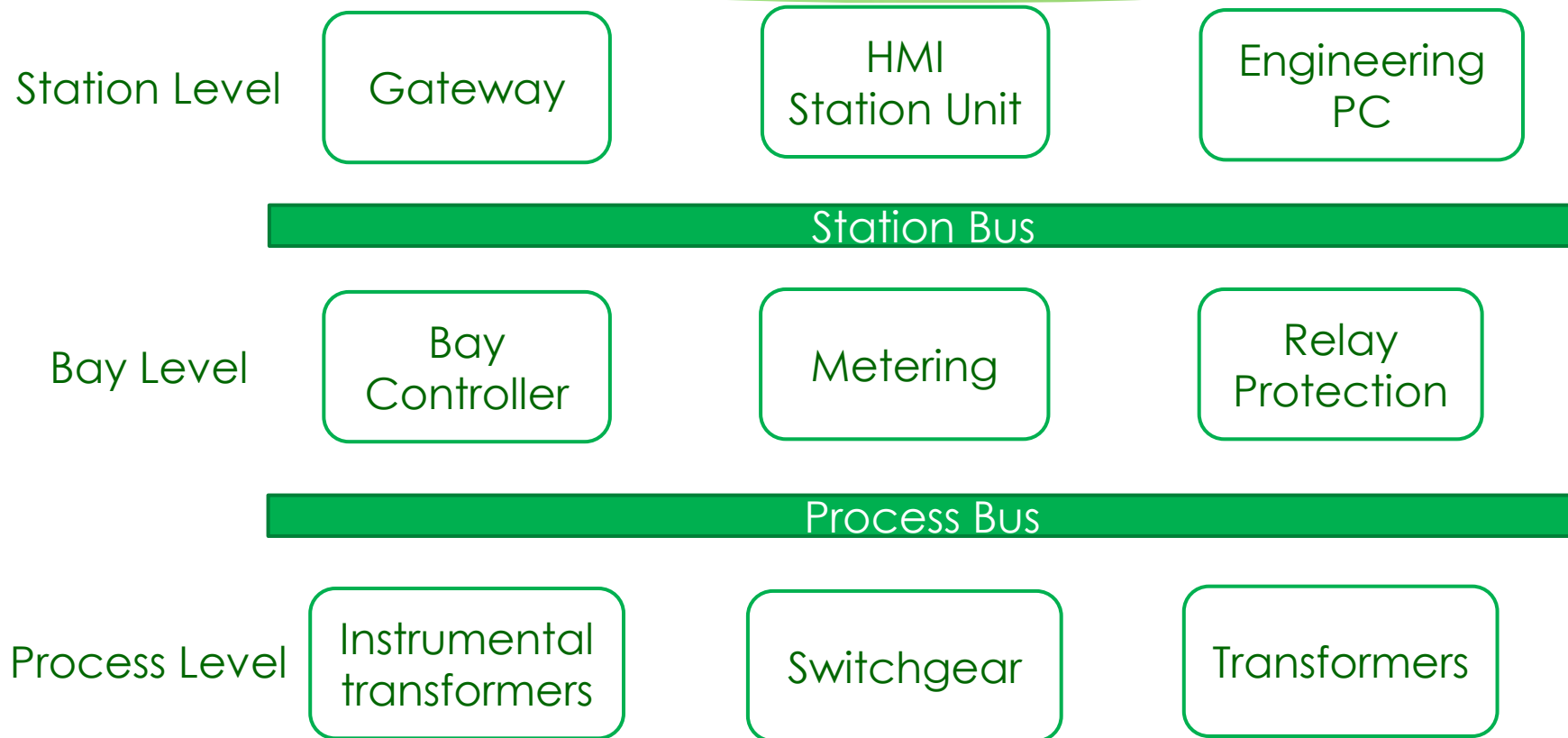
Why mobile technology?

How much are screen used? International survey made in 2014 accross 37 countries.
Source: [1]

IEC61850 Architecture

Station Level	Gateway	HMI Station Unit	Engineering PC

Station Bus

Bay Level	Bay Controller	Metering	Relay Protection

Process Bus

Process Level	Instrumental transformers	Switchgear	Transformers

Security Standards

- IEC 62351

Part 4: Profiles including MMS.	IEC 61850-8-1 MMS Profile
Part 6: IEC61850.	IEC 61850-8-1 MMS Profile, Goose Profile
	IEC 61850-9-2 Sample Values

- NERC CIP (Critical Infraestructure Protection).
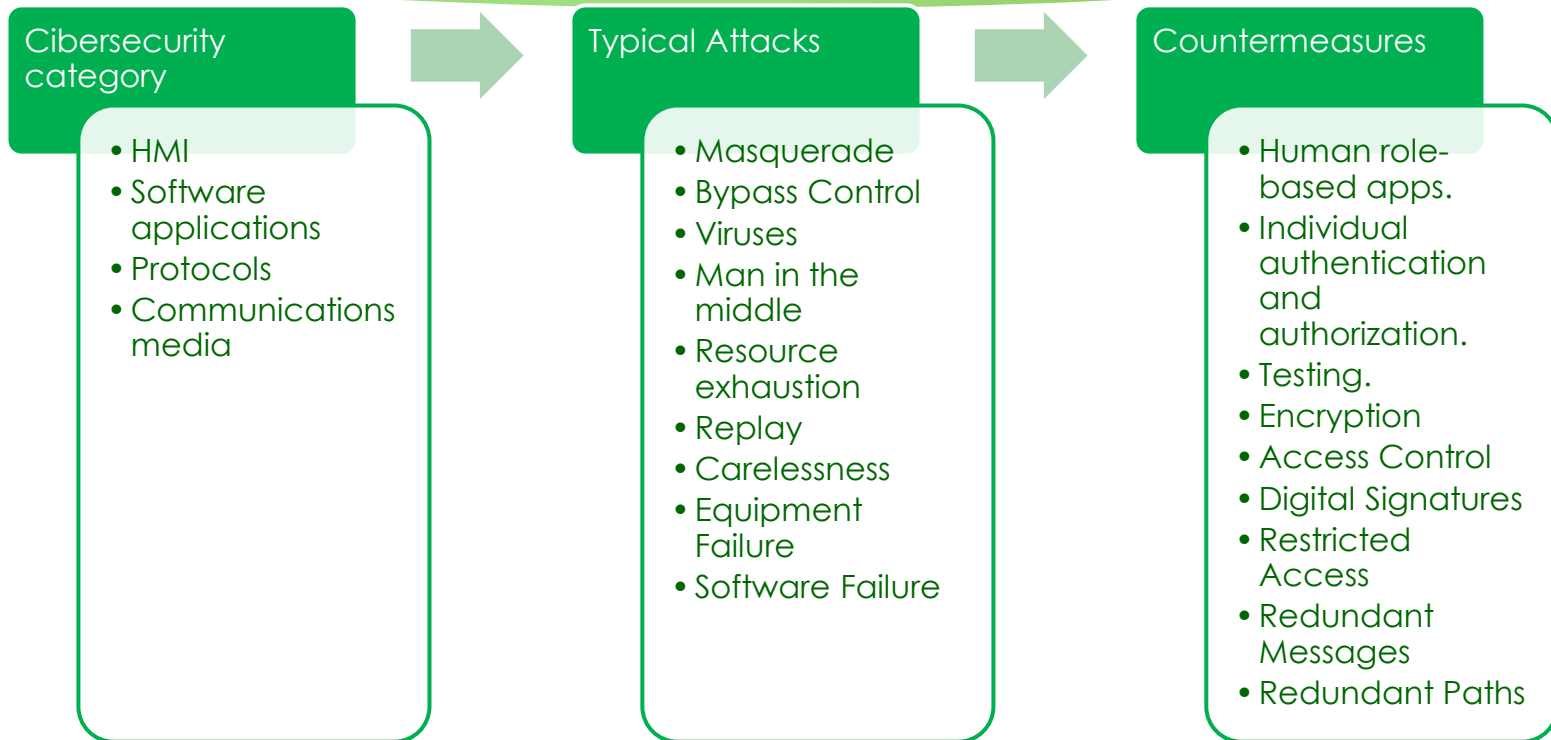
Mobile Security Requirements

Confidenciality: "Information is not made available or disclosed to unauthorized individuals, entities or processes" ISO 27000.

Integrity: To assure the accuracy and completeness of data.

Availability: To Guarantee the flow of information from a server to a client when is needed. Prevening denial of service.
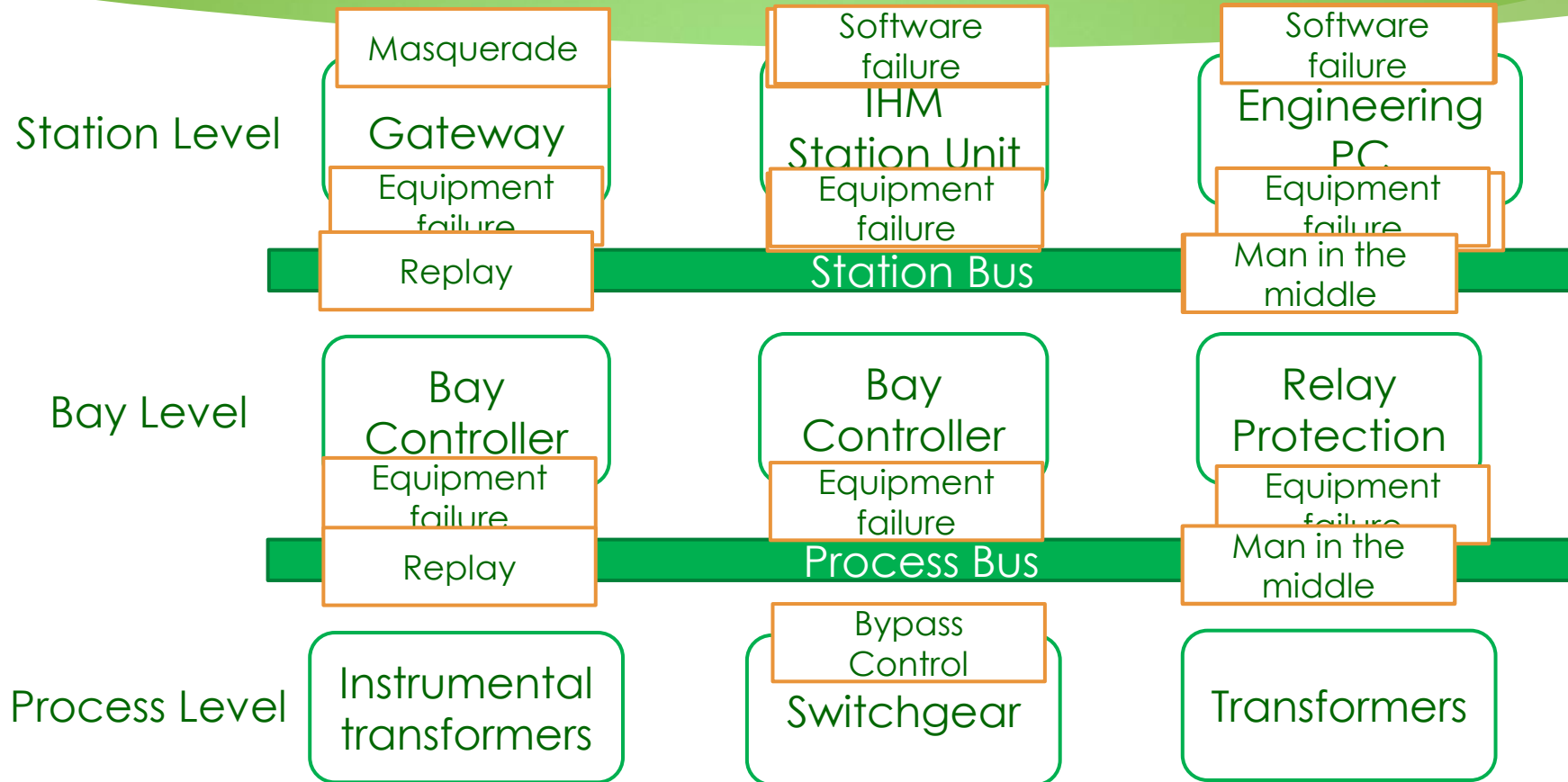
Non-repudiation: Ability to ensure that a communication cannot deny the authenticity of the sending of a message that they originated.
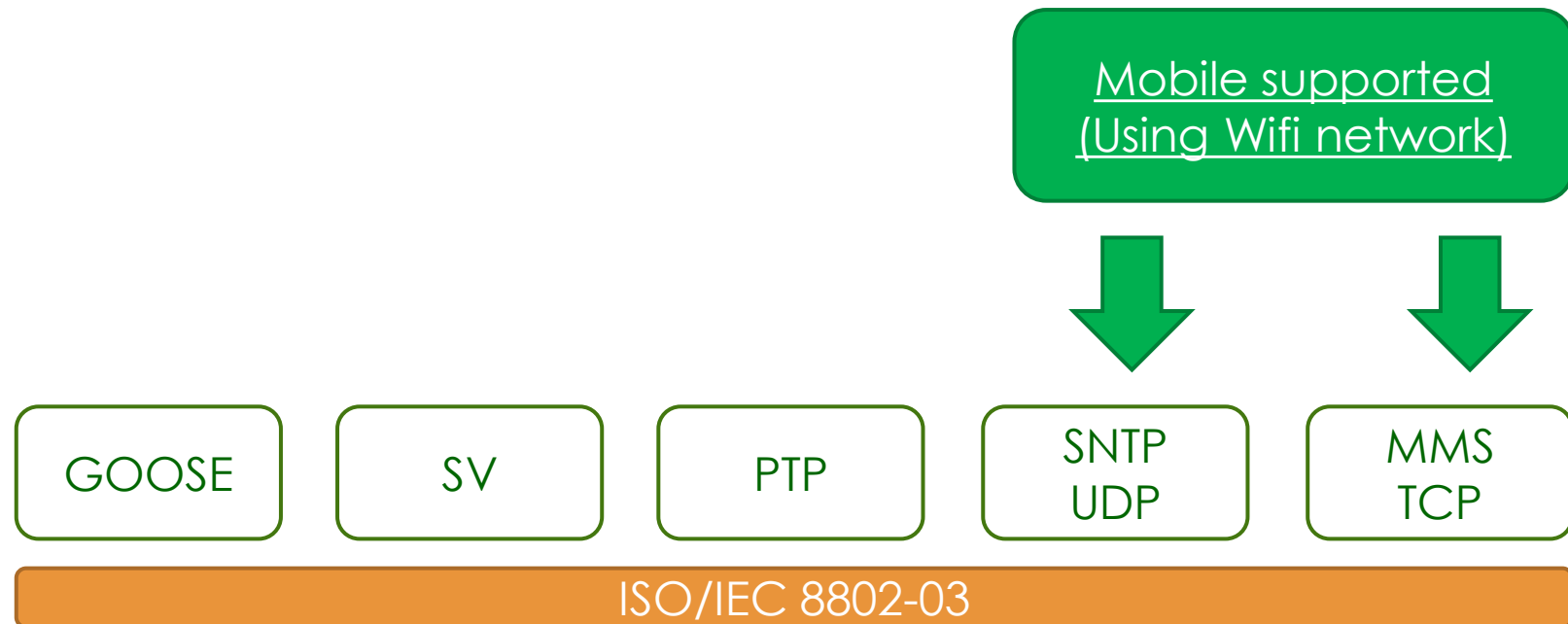
Mobile Security Requirement

Cibersecurity category

- HMI
- Software applications
- Protocols
- Communications media

→

Typical Attacks

- Masquerade
- Bypass Control
- Viruses
- Man in the middle
- Resource exhaustion
- Replay
- Carelessness
- Equipment Failure
- Software Failure

→

Countermeasures

- Human role-based apps.
- Individual authentication and authorization.
- Testing.
- Encryption
- Access Control
- Digital Signatures
- Restricted Access
- Redundant Messages
- Redundant Paths

IEC61850 Architecture

Station Level

Masquerade	Software failure	Software failure
Gateway	IHM Station Unit	Engineering PC
Equipment failure	Equipment failure	Equipment failure
Replay		Man in the middle

Station Bus

Bay Level

Bay Controller	Bay Controller	Relay Protection
Equipment failure	Equipment failure	Equipment failure
Replay		Man in the middle

Process Bus

Process Level

| Instrumental transformers | Bypass Control / Switchgear | Transformers |

IEC61850 Protocols Ed2

Mobile supported (Using Wifi network)

GOOSE	SV	PTP	SNTP UDP	MMS TCP

ISO/IEC 8802-03

Mobile HMI Advantages

Mobile devices used as HMI has the next advantages:

▶ Single user device. Enabling confidenciality and non-repudiation.

▶ Biometrics. Modern devices have a fingerprint reader which prevents unauthorized Access.

▶ They can't send raw Ethernet packages, like GOOSE or SV.

▶ Same device can be used on different substation.

▶ Brings mobility to supervision which is highly recommended.

▶ Reducing wiring cost.

OBSTACLE

Mobile Configuration

Substation LAN →

Wi Fi™

- WPA2/11i CCMP Enable/disable ports.
- MAC-based port security
- SSH/SSL Encryption
- VLAN(802.1Q)
- SNMP V3

- Strong password
- Hidden SSID
- ACL

- Fingerprint reader
- Remotely lock and erase features.
- App authentication and authorization.
- Antivirus installed.
- Firewall installed.

Mobile Security Tips

Security concerns on mobile devices are:

- ▶ Make sure your software is up-to-date.

- ▶ Employ strong passwords.

- ▶ Avoid unencrypted public Wireless networks.

- ▶ Use VPN to Access organization information.

- ▶ Watch the apps you download.
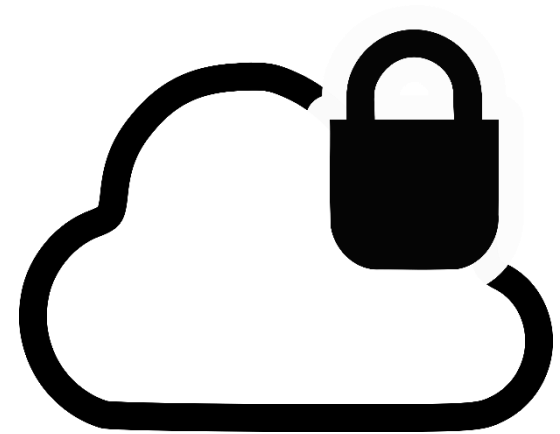
Mobile applications

▶ GIBSO is the result of transform the 61850 number to most similar characters as you can see on the next figure:

61850

GIBSO

GIBSO is a suite of tools used to improve IEC61850 knowledge management and to enable mobile comunications on IEC61850 standard. This is posible thanks to a partnership of 2 companies working together to achieve this goal.
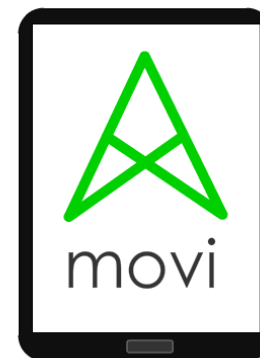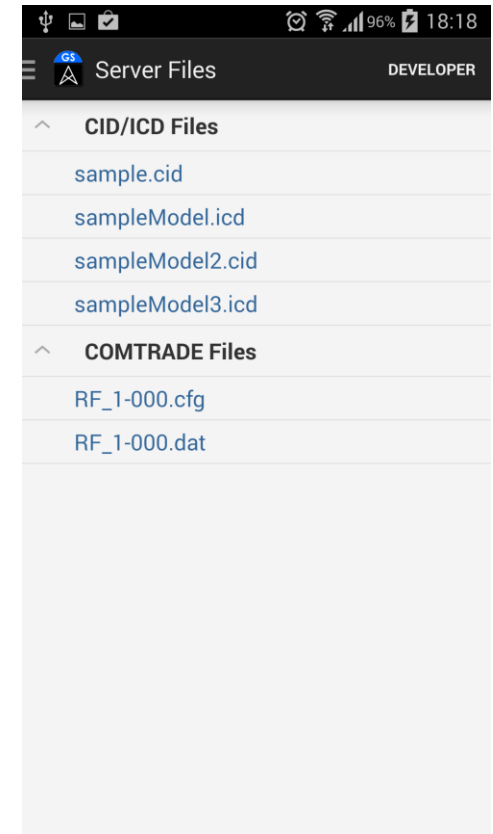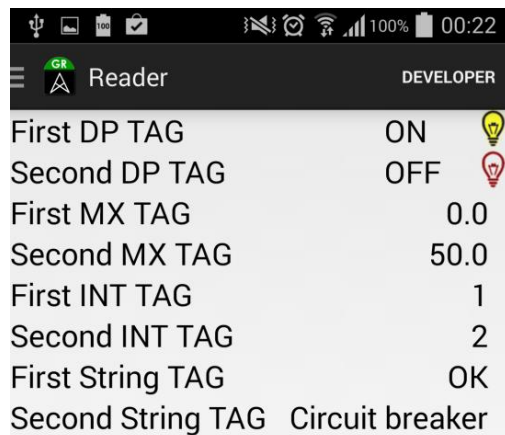
MMS Server

Sends the battery level of the mobile device via MMS on a BATT logical node.

Reading scl files from email or other sharing apps like Dropbox.
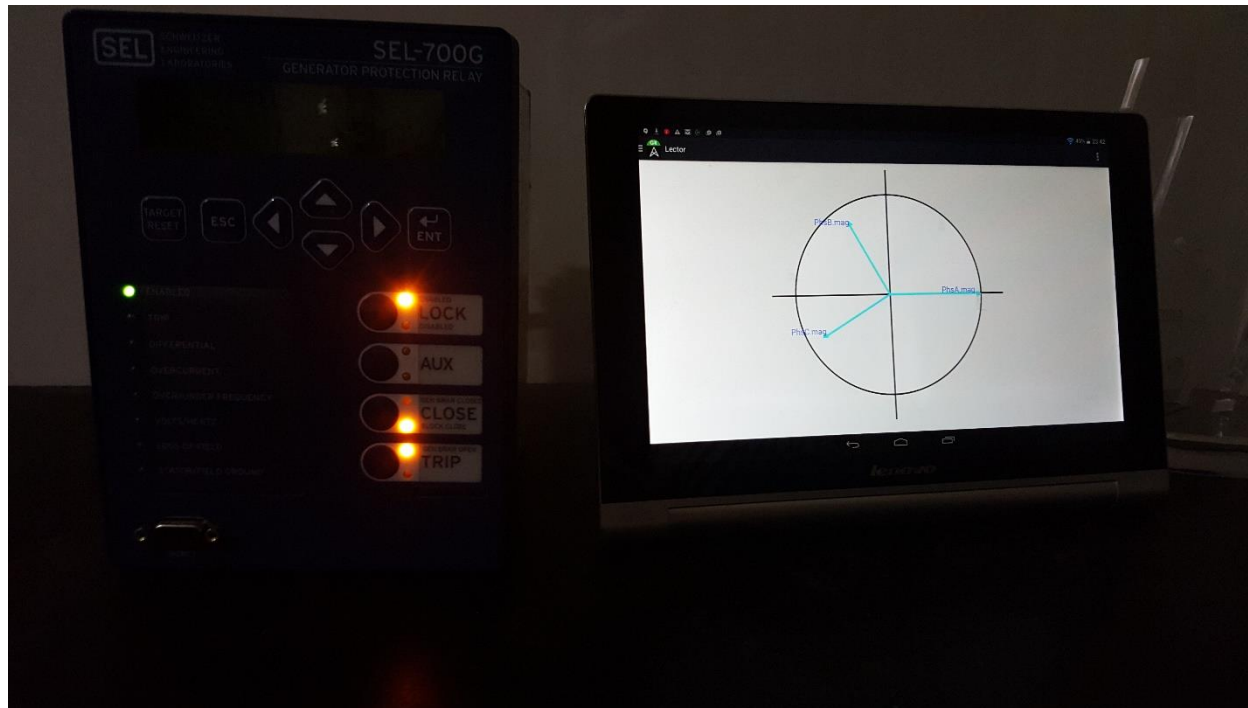
MMS client

Reading specific MMS variables from a IEC61850 Server

Using mobile apps on IEC61850 training courses.

MMS Tests

Mobile testing reading voltage phasors from an IED using a MMS client installed on a Tablet.

Thanks

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