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PRODUCT OVERVIEW

61850 EASY

monitor|diagnose|troubleshoot|test|simulate

INTRODUCTION

61850easy is an IEC 61850 Test Tool solution that allows users to monitor, diagnose, troubleshoot and simulate messages over an IEC 61850 network. 61850easy, as a vendor independent tool, addresses inherent protocol complexities and simplifies them into an understandable and easy to use format for all users.

61850easy is available in two primary formats:

61850easy
The 61850easy software comes pre-installed onto a small form factor desktop PC

61850easy VIRTUAL
61850easy VIRTUAL enables users to install the 61850easy software onto any Windows based operating system capable of utilizing VMware Player

Once a user has selected their preferred format, they can also choose the functionality package to suit their individual requirements and applications:

- 61850easy Test Set
  A complete test set solution with access to all functionality
- 61850easy Core Package
  An entry level testing solution with the ability to add-on extra functionality packages:
  - GOOSE Publisher Package Add-On
  - MMS Services Package Add-On

61850easy eradicates the myth that the configuration and usage of an IEC 61850 based substation automation system can only be achieved by communication protocol experts. Through leading edge technology and world class development, 61850easy enables test engineers to visualise and simulate traffic in an IEC 61850 system.

WHY IEC 61850 AND 61850easy?

61850easy IS SUITABLE FOR:

- Testing of IEC 61850 based systems, in a laboratory environment – FAT & SAT applications

- Design and functional testing of IEC 61850 systems

- Commissioning of IEC 61850 based systems

- Verification of server implementations

- Learning the IEC 61850 standard

- Demonstrations of IEC 61850 IEDs

- Training & education purposes

TOP LEVEL CORPORATE BENEFITS:

- Reduce project execution duration in configuration and testing phases

- Increase the efficiency of client site commissioning actions

- Improve quality of IEC 61850 engineering activities

- Increase knowledge in IEC 61850 standards and implementation

- Significantly reduce wiring complexity

- Reduce footprint of site/substation installation

- Cost reduction in IEC 61850 architecture, design and implementation

- Improve profitability

TOP LEVEL SOFTWARE BENEFITS:

- Open communication – Full benefits of using a mainstream communication technology such as Ethernet

- Integrated protocols to provide real time monitoring applications

- A standardised object model that supports logical location of data and device functions

- Standardised data naming conventions

- Common syntax and semantics

- Common configuration control through SCL

- Minimal manual configuration is required for the client applications and devices, reducing errors and lowering commissioning costs
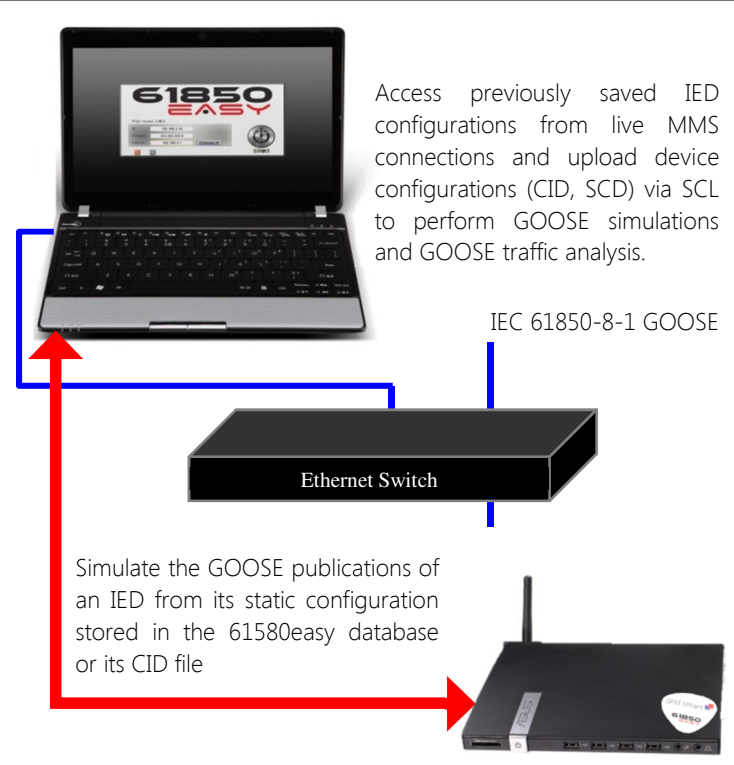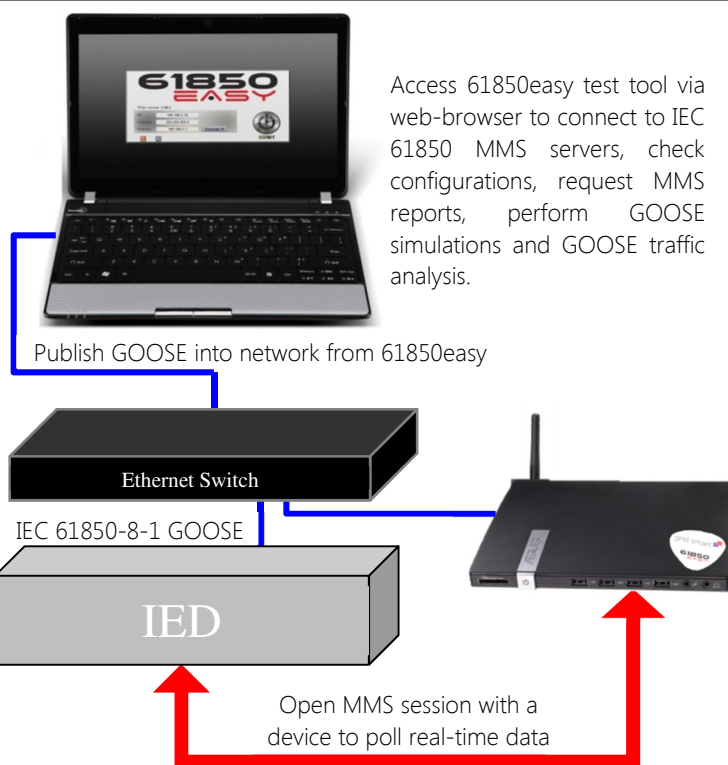
61850easy SOFTWARE FEATURE

- Self-discovery
- MMS Read/Write
- MMS Client
  - Live MMS Reports (Buffered & Unbuffered)
  - MMS Discovery
- GOOSE Publisher & Subscriber
  - Individual GOOSE Simulation
  - Simulation of an IED's configured GOOSE traffic
  - GOOSE Sequencer (create, play and record triggered sequences)
  - GOOSE Live Analysis (Filtering by DataSets, Data Attributes, Events)
- Analyzer for archiving, searching and analysing GOOSE and MMS Reports
- Supports use of VLANs and priority tagging
- Multivendor interoperability
- Embedded Tools

THE TECHNOLOGY

- WEB based tool – ready to use instantly
- Composed of two modules:
  Server and Client
- **61850easy Server**
  - Running core software on Linux (Ubuntu) platform
  - Available as 61850easy pre-installed on a small form factor PC or 61850easy VIRTUAL which can be installed by users on their own compatible devices
  - Connected to IED's network
- **61850easy Client**
  - Rich Internet Application (RIA) built on Adobe Flash platform
  - Initiated from PC browser connected within the server network or remotely using VPN

TESTING ENVIRONMENTS WITH 61850easy USING LIVE CONNECTIONS OR SCL FILES

Access 61850easy test tool via web-browser to connect to IEC 61850 MMS servers, check configurations, request MMS reports, perform GOOSE simulations and GOOSE traffic analysis.

Publish GOOSE into network from 61850easy

Ethernet Switch

IEC 61850-8-1 GOOSE

IED

Open MMS session with a device to poll real-time data

Access previously saved IED configurations from live MMS connections and upload device configurations (CID, SCD) via SCL to perform GOOSE simulations and GOOSE traffic analysis.

IEC 61850-8-1 GOOSE

Ethernet Switch

Simulate the GOOSE publications of an IED from its static configuration stored in the 61580easy database or its CID file

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61850easy FORMATS

61850easy VIRTUAL

61850easy VIRTUAL is available to users who wish to install a 61850easy Software Package onto their own PC/laptop or other compatible device. The virtual package removes the need for an additional hardware device and enables the easy installation of the software onto Windows based operating systems through compatible VMware platforms.

61850easy VIRTUAL – MINIMUM DEVICE REQUIREMENTS

- Windows OS and compatible with the installation of VMware Player
- Minimum of 20GB of storage allocation from host device for Virtual Machine
- Standard Disk Drive
- 2 x USB2.0 Ports

Please note that 61850easy VIRTUAL packages are not recommended for testing applications with large SCD files or high volumes of GOOSE traffic capture & storage

61850easy

The 61850easy comes pre-installed by Grid Smart onto a small form factor PC. This dedicated test set resource provides the ability to carry out long term testing and monitoring using the devoted storage and processing facilities offered by the integrated hardware. This format also offers practical multiple user access where additional licences can be purchased by the user.

KEY 61850easy HARDWARE FEATURES:

- Intel® Atom™ D2550 Dual-Core Processor 1.86GHz
- DDR3-1066Mhz 2GB (up to 4GB)
- 320GB SATAII Hard Disk
- 4 x USB2.0 & 2 x USB3.0 & 1 x 4 -in-1 Card Reader
- 1 x HDMI out & 1 x D-Sub out
- 1 x Ethernet LAN RJ-45 10/100/1000Mbps
- 19Vdc, 3.42A, 65W Power adapter
- Weight – 0.7kg (1.54lb)
- Dimensions – 219mm x 172.5mm x 29mm (8.6" x 6.8" x 1.1")
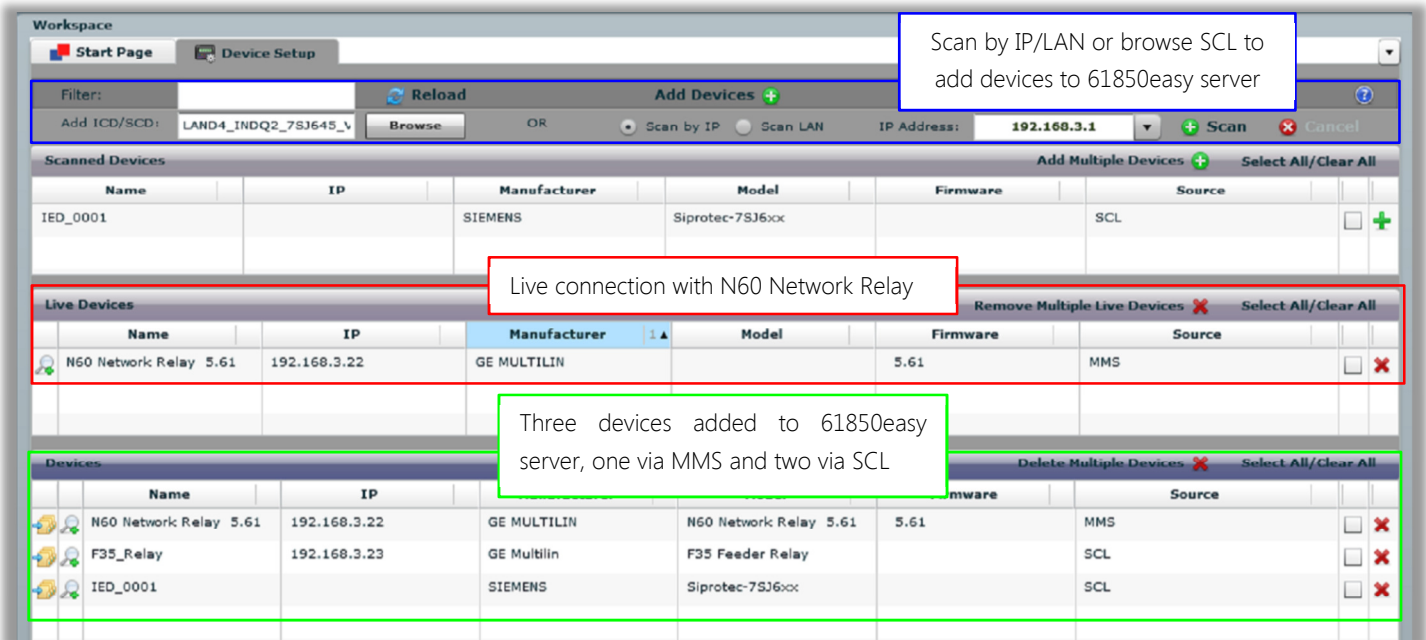
61850easy PACKAGES

61850easy CORE PACKAGE

Setup & Management

- Easy UI's and navigation
- User management of hardware resources and database/storage
- Add preconfigured or live devices to the 61850easy Server:
  - Via SCL or MMS Client respectively
  - Via scanning the LAN/IP for live devices using MMS Client
- Browse any IEC 61850 GOOSE Server and associated GOOSE Control Blocks, by adding devices to the 61850easy Server
- Save/Load user workspace(s)
- The GOOSE Connections viewer provides an interactive GUI showing the publishing and subscribing devices from an imported SCD file

ADDING DEVICES – ADD DEVICES VIA MMS CLIENT AND SCL

GOOSE Subscriber

- Capture all GOOSE traffic in the selected network (including Fixed GOOSE) and monitor live traffic with flexible views and smart filters to show:
  - GOOSE Live capture
  - GOOSE DataSets Live (user-definable)
  - GOOSE Events Live
  - GOOSE Live 'Test' traffic
  - Live Capture of Simulated GOOSE traffic
  - Advanced device data mapping of GOOSE traffic utilising devices added to the 61850easy Server
  - Export Live GOOSE packet capture to XML or CSV file format
  - Capture and diagnose incorrectly configured GOOSE messages

GOOSE EVENTS LIVE CAPTURE – FILTER DOWN TO SPECIFIC EVENTS OF A DEVICE

Callouts on screenshot:
- Select which device and other filters you wish to use
- View key data from the filtered GOOSE events
- Drill down into the GOOSE packet details

GOOSE Publisher

- Create and simulate individual GOOSE packets using the GOOSE Publisher:
  - Emulate a packet from a live device
  - Create network traffic for end to end testing
  - Test live device(s) setup and configuration

SEND GOOSE PACKETS – DEFINE ALL PARAMETERS, ADD VALUES AND SEND YOUR GOOSE

Callouts on screenshot:
- Build the DataSet
- Edit the frame header
- Choose, edit and add DataSet elements
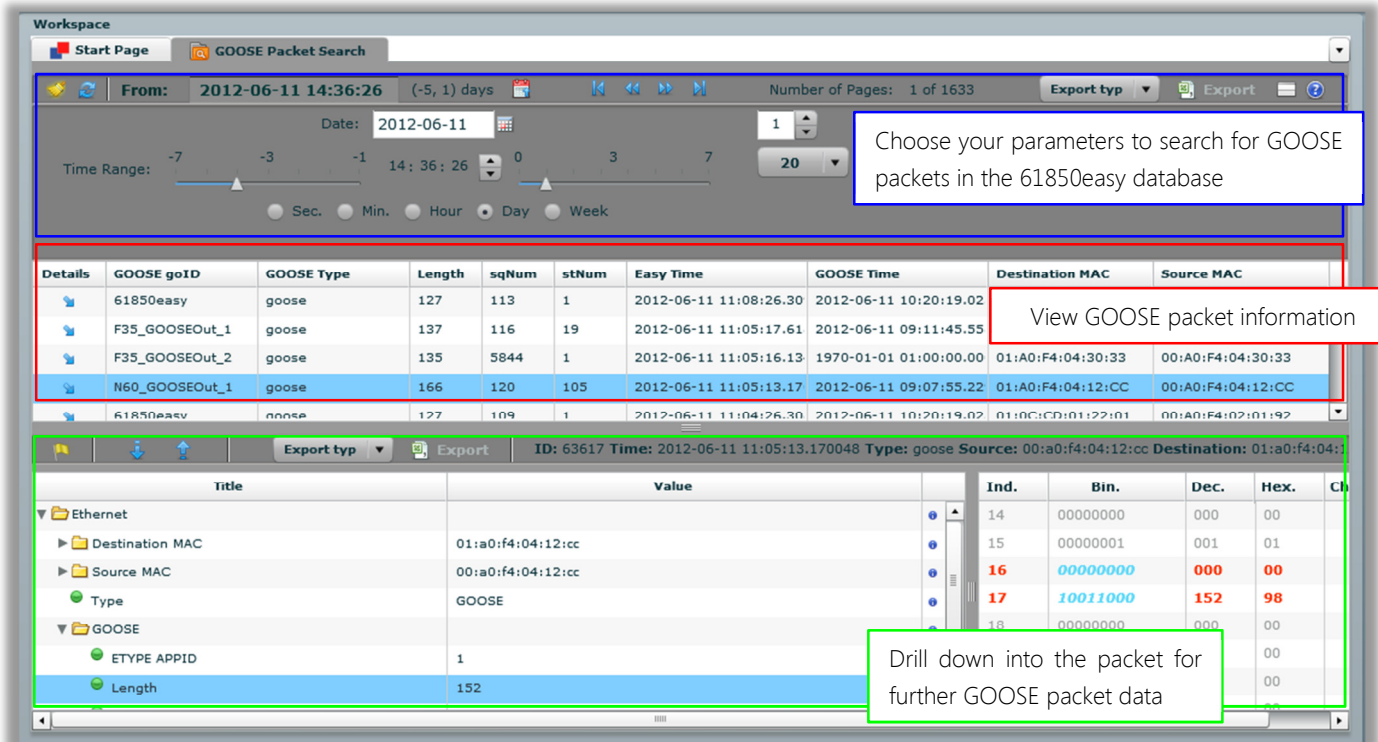
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GOOSE Analyzer

- Provides access to archived GOOSE packets with enhanced search facilities and smart filters:
  - Advanced device data mapping of GOOSE traffic utilising devices added to the 61850easy Server
  - Access all archived GOOSE traffic
  - Export filtered data to XML or CSV file format
  - Export archived packets to XML or CSV file format

GOOSE ANALYZER PACKET SEARCH – SEARCH FOR PACKETS WITHIN USER DEFINED TIME RANGES

MMS Discovery

- Live object model monitoring
- Browse any IEC 61850 MMS server
- Device Discovery:
  - View latest real time data values from polled devices
  - Display tabs/subsets of the object models (measurements, protection, etc.)
- Points Panel – display of real time data values in a user definable view
- Add descriptions to data attributes
- Edit accessible data attributes within an object model

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> Use '61850easy' View to quickly browse the IEC 61850 data of a device added to the database

Embedded Tools

- SMART grouping and dynamic help for all IEC 61850 models to assist users
- Viewer & Diff function for SCL files (IEC 61850 part 6-1) based upon XML technology
- COMTRADE viewer for displaying of stored binary or ASCII files signals and waveforms

DYNAMIC HELP FUNCTION – WITH THE CLICK OF A BUTTON ACCESS HELP ON THE ELEMENTS OF IEC 61850

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GOOSE PUBLISHER AND MMS CLIENT PACKAGE ADD-ON

Additional GOOSE Publisher Functionality

- Simulate a packet or packets from a live device including their associated retransmission
- Manually simulate the GOOSE publications of an IED or multiple IEDs (via SCL & MMS Client)
- GOOSE Sequencer – produce user definable and automated simulation test sequences and traffic utilizing time and state triggering options (from live GOOSE traffic) for individual or multiple devices
- GOOSE In Simulation – monitoring application detailing all 61850easy simulated GOOSE packets
- Create simulated live traffic for lab testing, FAT and SAT applications
- Edit simulated device(s) GOOSE Control Block attributes
- Clone 61850easy Server devices

SIMULATE GOOSE – MANUALLY SIMULATE PACKETS FROM A DEVICE

GOOSE SEQUENCER – CREATE A USER DEFINABLE SIMULATED TEST SEQUENCE

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- Live access to Buffered & Unbuffered Reports
- Edit the individual attributes of the report control block
- View the active DataSet from a selected report
- Enable individual or multiple reports simultaneously with unique colour tagging

BUFFERED REPORTS – COLOUR TAGGING OF LIVE BUFFERED REPORTS

Select your designated time range search and criteria

Enable reports with the click of a mouse

View your selected live reports and click the details tab for further information

MMS Analyzer

- Provides access to archived reports with enhanced search facilities and smart filters:
    - Access all archived MMS Buffered & Unbuffered reports
    - Export filtered data to XML or CSV file format

UNBUFFERED REPORTS SEARCH – SEARCH FOR PACKETS WITHIN USER DEFINED TIME RANGES

Select your designated time range search and filters for reports in the 61850easy database

View report data

Drill down into specific report details with the ability to export data as necessary

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MMS SERVER PACKAGE ADD-ON

MMS server

- Simulate a single IED MMS Object Domain from an ICD file
- Able to accept read/write commands from an MMS Client
- Able to simulate buffered reports.

MMS Server Simulator allows the 61850easy to accept client commands

The MMS Server Simulator also allows the simulation of Buffered reports.
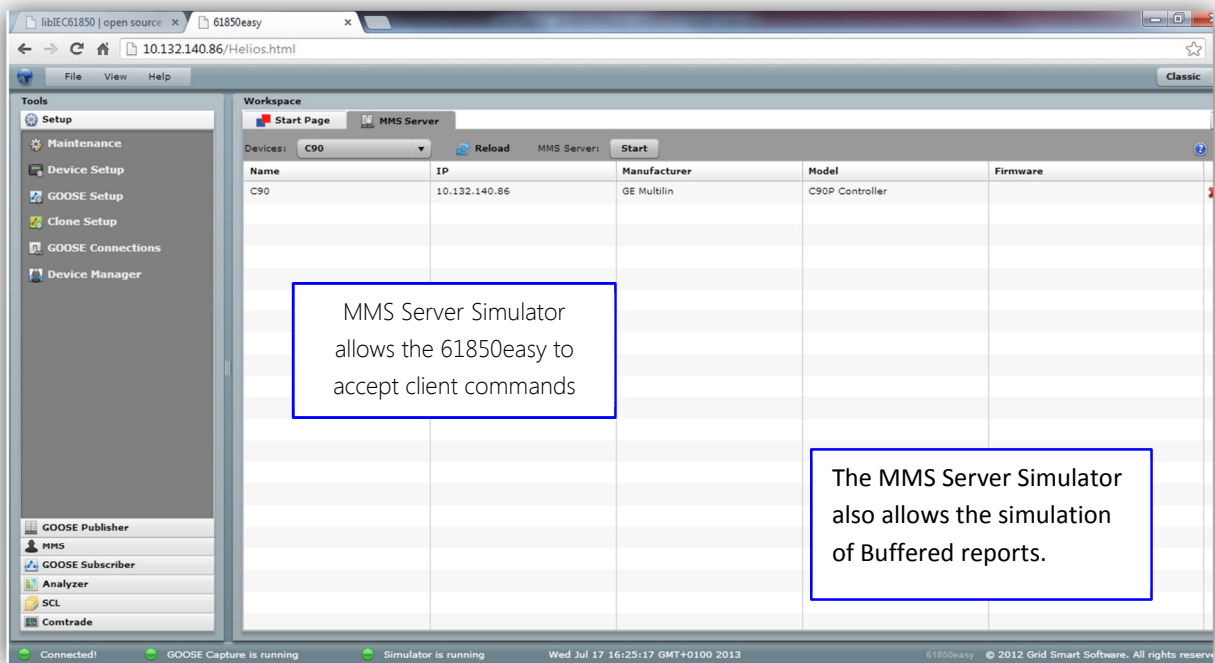
EXAMPLE OF IEC 61850 LAN CONNECTION WITH 61850easy
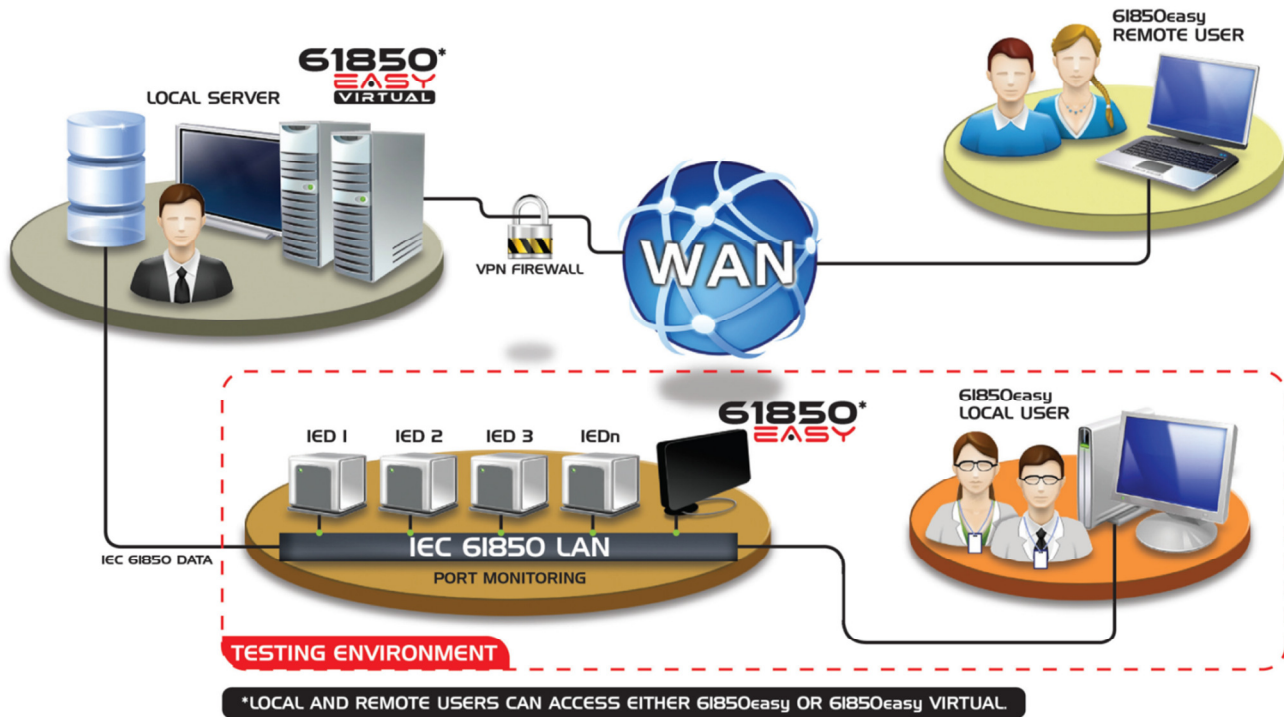
61850easy TEST SET

The 61850easy Test Set is Grid Smart's complete IEC 61850 test solution that combines the entire range of functionality detailed in our 61850easy Core, GOOSE Publisher and MMS Services Packages. Available in both embedded and virtual formats, the 61850easy Test Set combines all of the key advantages of the core, add-on packages and associated functionality in one user workspace.

61850easy LICENCE INFORMATION

All Grid Smart's 61850easy packages include a single client licence, additional client licences may be purchased for 61850easy but not for 61850easy VIRTUAL packages.

MULTIPLE CLIENT LICENCES

When a client PC accesses the 61850easy server for the first time it must be registered. Once a client PC has been registered it consumes a licence, when all the available licences are consumed no additional client PC's are able to access the 61850easy server. In order to allow another PC to connect to 61850easy the user must unregister a previously registered PC from the 61850easy server.

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SERVICE SUPPORT & DEVELOPMENT

Each 61850easy package has an accompanying annual support package which provides users with access to technical support and software updates when issued from our specialist team. Renewable annually, the support package ensures all updates are provided accordingly and information in relation to the future development of the equipment and software will be made available by Grid Smart Software, including any new functionality releases that are relevant to the respective 61850easy packages.

SERVICE SUPPORT

Account Management – Each client is assigned an Account Manager from the outset. The Account Manager is the primary contact for client requirements (via the Service Desk), excluding immediate service support requirements. The Account Manager will deliver all release update information; statutory change update information; R&D strategy with precedence. The Account Manager will also work with you to ensure you have full visibility of all 61850easy user groups and online forums.

Service Support Model – The Grid Smart service model allows users to liaise directly with the System Development Team. We don't believe that 1st /2nd/3rd Tier support models deliver value to the customer. In line with our agreed Service Level Agreement (SLA), the service support team will provide issue resolution and fault diagnosis; problem resolution; 'how to' support; system and software updates; statutory changes to software; release documentation and training notes.

DEVELOPMENT

As a part of the annual support package, at no additional cost, users will have access to all system updates for the software. New functionality that is released through Grid Smart's Research & Development (R&D) schedule may be included with the annual support package (dependent upon the functionality provided).

As a core supplier within the IEC 61850 global market, Grid Smart operates an aggressive R&D strategy that sees new functionality and modules released across the year, alongside full documentation, technical notes and user guides.

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AT THE HEART OF IEC 61850 EXCELLENCE

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