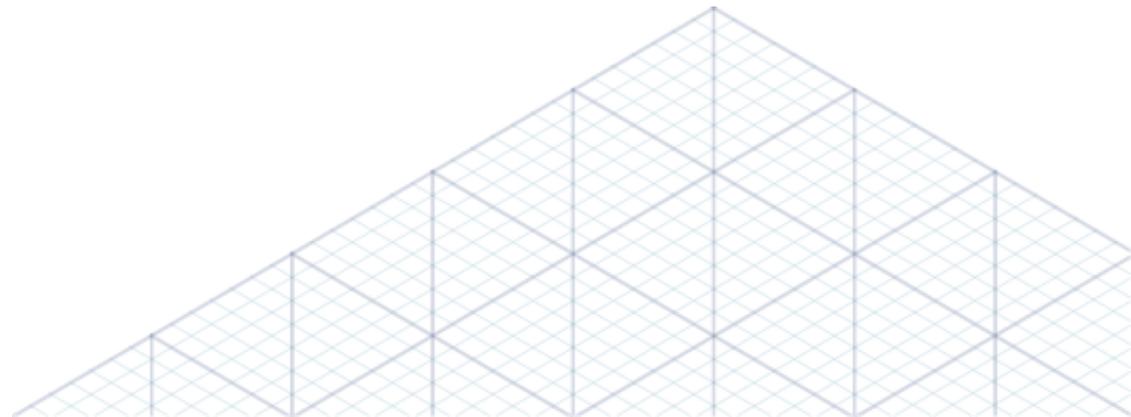
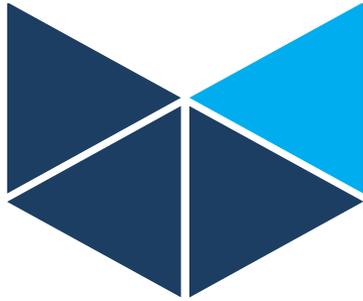




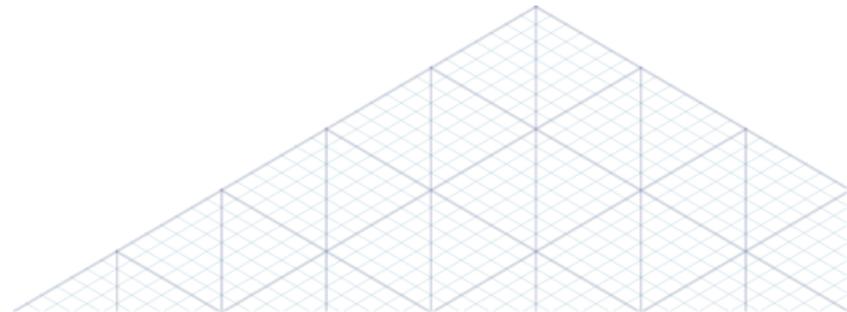
BRODERSEN
simplifying systems

IEC61850 Client in RTU32 Series
Presentation





Features and how to configure the RTU32 IEC61850 Client





RTU32 IEC61850 Client driver facts

- Client driver is integrated in the RTU32 PLC – and configured in STRATON.
- Delivered as add-on Runtime License
- The driver is configured in STRATON standard Bus Configurator and variables are loaded from IEC61850 Server or from SCL file and the driver is automatically generating with all necessary profiles and variables.
- You can freely adjust the configuration and add your own application
- STRATON Programming environment online Help provide all necessary details

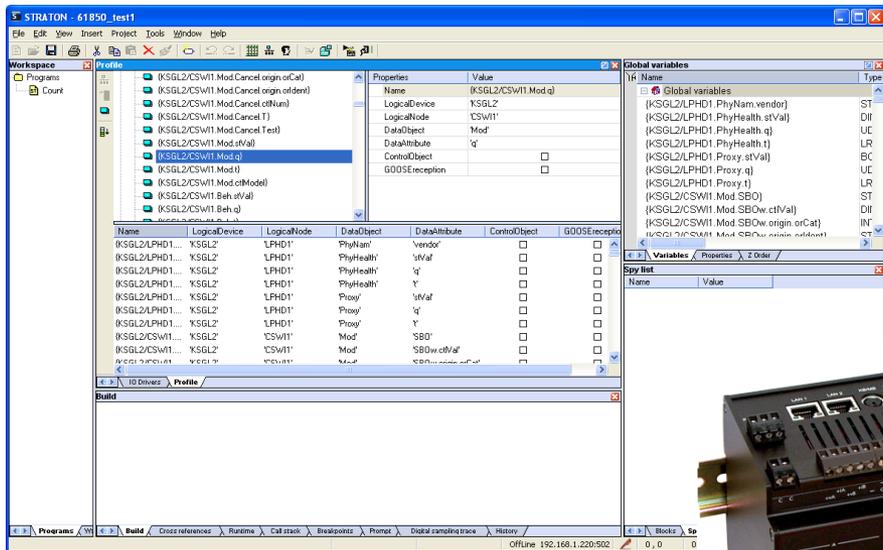
RTU32 IEC61850 Client features

- ICD (SCL) support
- Report Control Blocks (RCB)
 - Predefined
 - Dynamic
- File Transfer (GetFile & DeleteFile)
- Unbuffered reporting
- Buffered reporting





How to configure IEC61850 Client in RTU32 PLC / STRATON

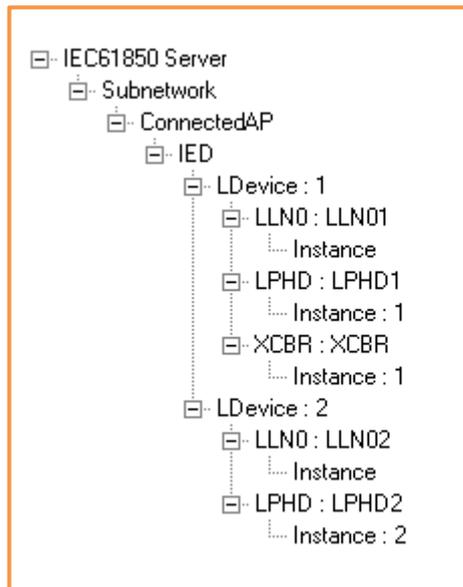




If the IEC61850 Server do not support the possibility to read configuration directly from the device – you will need the SCL file from the device

- An SCL editor is the tool necessary to create the configuration of an IED up to a complete system. Use e.g. Kalki SCL-Manager or ASE Visual SCL.
- The output file is a SCL configuration file – save it on your PC

SCL editor



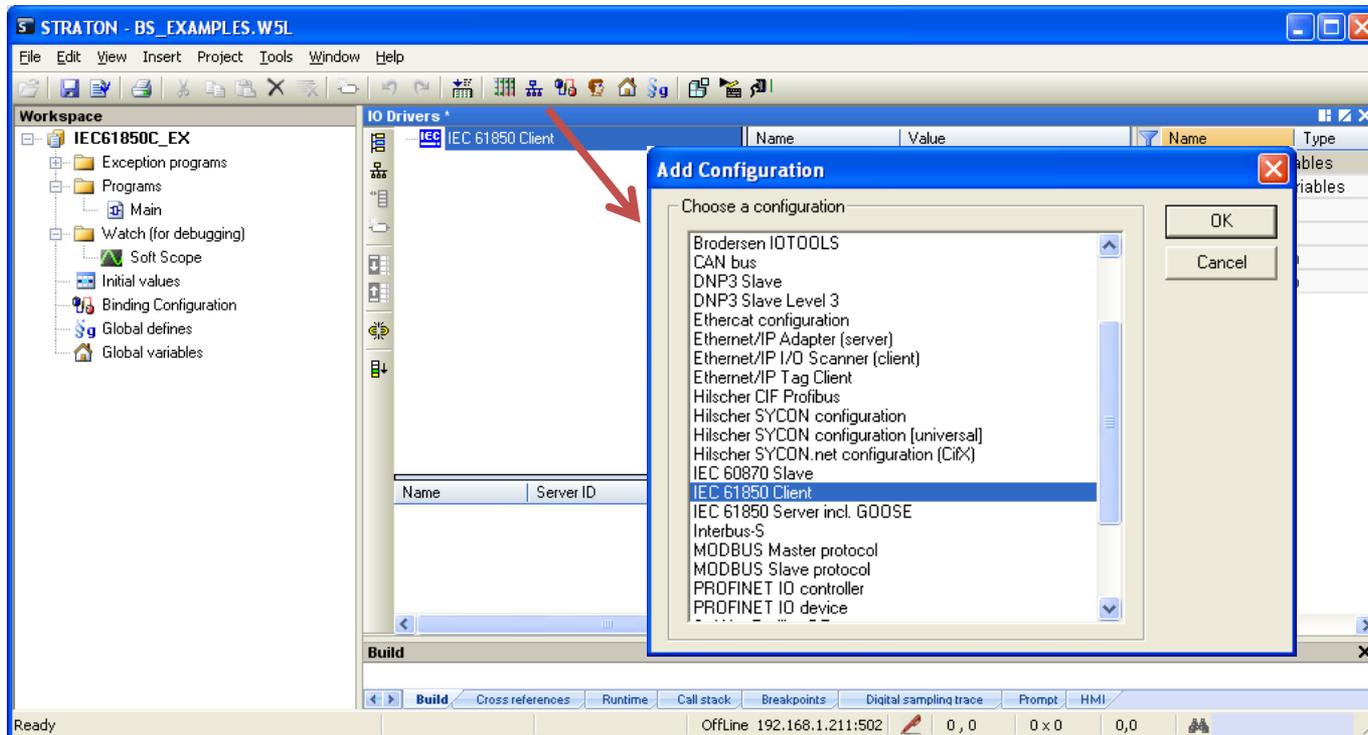
RTU32



IEC61850 Client Driver configuration in RTU32



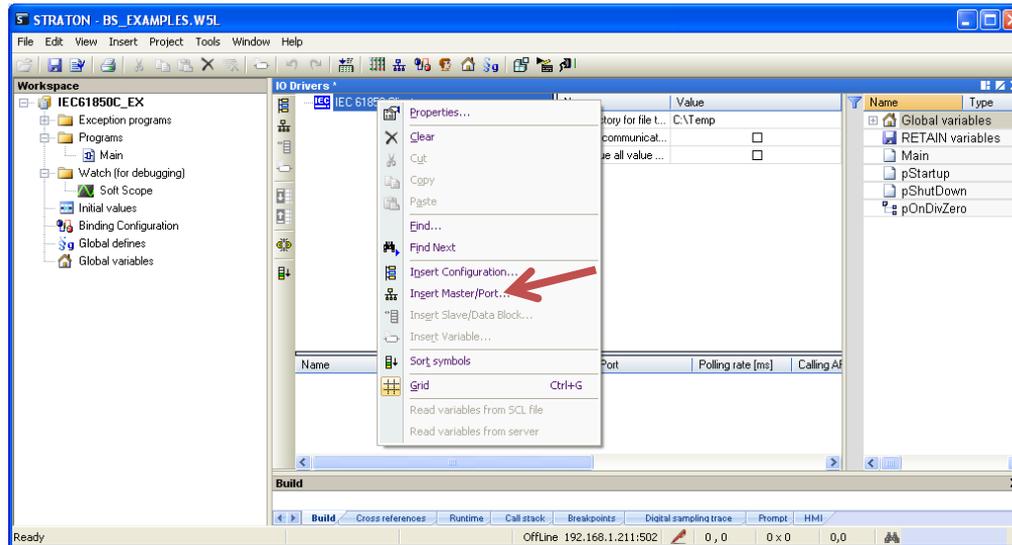
Start the RTU32 Programming environment – STRATON WorkBench
Choose IEC61850 Client in the STRATON Fieldbus Configurator



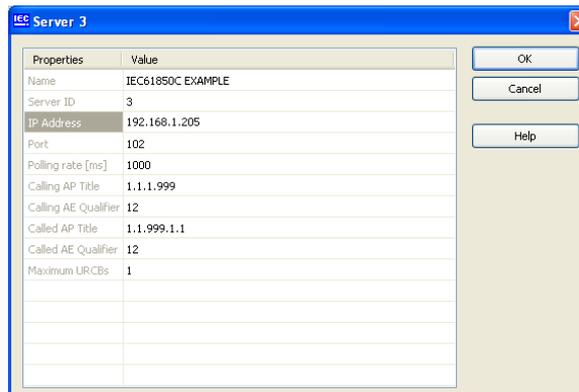
IEC61850 Client Driver configuration in RTU32



Insert Master/port



And setup the necessary properties for each Server connection



IEC61850 Client Driver configuration in RTU32



Import IEC61850 Server object data and create variables from the Server or from a SCL file

The screenshot shows the IEC61850 Client Driver configuration software. The main window displays the 'IO Drivers' table with the following data:

Name	Value
IEC61850C Ex	4
192.168.1.205	102
[ms]	1000
Title	1.1.1.999
Qualifi...	12
Title	1.1.999.1.1
Qualifi...	12
JRCBs	1

A context menu is open over the table, with a red arrow pointing to the 'Read variables from server' option. The 'IEC61850C Ex: Select variables' dialog box is also open, showing a tree view of variables to be imported. The 'Declare variables in data base' checkbox is checked.

Based on a uploaded data list, you select/define the relevant data you need as variables in your application.

IEC61850 Client Driver configuration in RTU32



Now use the Profile Editor to monitor the complete imported Data Set.

Link between STRATON and IEC61850 is done through the parameters: LogicalDevice, LogicalNode, DataObject, DataAttribute.

The screenshot displays the STRATON software interface with the following components:

- Workspace:** A tree view on the left showing the project structure, including folders for Exception programs, Programs, Watch (for debugging), Initial values, Binding Configuration, Global defines, and Global variables.
- IO Drivers:** A central pane showing the configuration for the IEC61850 Client. It lists various data objects and attributes, such as LLNO/Beh/q[ST] and MmuPriMSTA1/Beh/q[ST]. A red arrow points to the top toolbar of this pane.
- Global variables:** A pane on the right showing a list of global variables with their names and types, such as {ExampleTEMPLATEControl/CILO1/Beh/d[DC]} of type STRING(2).
- Callouts:** Three callout boxes provide additional information:
 - "IEC61850 Client configuration" points to the IO Drivers pane.
 - "IEC61850 Clientconfiguration Details view" points to the bottom status bar.
 - "STRATON variables definition" points to the Global variables pane.

IEC61850 Client Driver configuration in RTU32



Function Blocks in simple PLC program can be used for some IEC61850 Client functions like File Transfer etc.

FileTransfer used for uploading e.g. COMTRADE files from IEC61850 Server devices. You have to define;

- Path for placing the files in the RTU32 (defined in the basic driver configuration)
- IEC61850 Server Id
- File name

The screenshot shows the STRATON software interface. The main workspace displays a PLC program titled 'IEC61850 Client driver Function for File Transfer'. The program consists of a single function block labeled 'IEC61850_FTGET'. The inputs to this block are 'SERVERID' and 'FILEDESC', both represented by '???' symbols. The output is also represented by a '???' symbol. A callout box points to this function block with the text: 'FunctionBlock PLC program example using the IEC61850 Client function'. On the right side, the 'Variables' panel is open, showing a list of IEC61850 functions. The function 'IEC61850_FTGET ("Request file to be transferred")' is highlighted. A callout box points to this function with the text: 'STRATON Function for IEC61850'. The 'Workspace' panel on the left shows the project structure, including 'IEC61850C_EX', 'Exception programs', 'Programs', and 'Main'. A red arrow points to the 'Main' folder in the workspace.

- The stored files can be access and uploaded/downloaded via FTP from The RTU32. You can used USB Memory if you want files stored outside the normal file systems drives.



IEC61850 type of Logical Nodes

Name	Description
Axxx	Automatic Control (4). ATCC (tap changer), AVCO (volt. ctrl.), etc.
Cxxx	Supervisory Control (5). CILO (Interlocking), CSWI (switch ctrl), etc.
Gxxx	Generic Functions (3). GGIO (generic I/O), etc.
Ixxx	Interfacing/Archiving (4). IARC (archive), IHMI (HMI), etc.
Lxxx	System Logical Nodes (2). LLN0 (common), LPHD (Physical Device)
Mxxx	Metering & Measurement (8). MMXU (meas.), MMTR (meter.), etc.
Pxxx	Protection (28). PDIF, PIOC, PDIS, PTOV, PTOH, PTOC, etc.
Rxxx	Protection Related (10). RREC (auto reclosing), RDRE (disturbance)..
Sxxx	Sensors, Monitoring (4). SARC (archs), SPDC (partial discharge), etc.
Txxx	Instrument Transformer (2). TCTR (current), TVTR (voltage)
Xxxx	Switchgear (2). XCBR (breaker), XCSW (switch)
Yxxx	Power Transformer (4). YPTR (transformer), YPSH (shunt), etc.
Zxxx	Other Equipment (15). ZCAP (cap ctrl), ZMOT (motor), etc.
Wxxx	Wind (Set aside for other standards)
Oxxx	Solar (Set aside for other standards)
Hxxx	Hydropower (Set aside for other standards)
Nxxx	Power Plant (Set aside for other standards)
Bxxx	Battery (Set aside for other standards)
Fxxx	Fuel Cells (Set aside for other standards)

As of the flexible implementation of IEC61850 in RTU32 – special Logical Nodes are also supported!



After configuration of the IEC61850 Client Driver you can:

- Link variables directly to physical I/Os
- Link variables to your own designed User Defined Function Blocks – that could be often used blocks or parts of your application
- Link variables to PLC programs where you have manipulated the data after your own requirements

Note that:

- You can find details of setup and configuration in the STRATON HELP
- Details of supported functions – ACSI Conformance Statement are also found in STRATON Help
- The RTU32 PLC/RTU is the ultimate Gateway as you can:
 - Run several drivers parallel incl. IEC61850 Server, IEC60870, DNP3, Modbus, ProfiBus etc.
 - Freely exchange and manipulate data as all are available as STRATON PLC variables.
- You use STRATON WorkBench with unlimited I/Os when you are working with IEC61850 Drivers as you will quickly add-up many variables in your application.