

IEC 61850 OPC Solution



ReLab Advantages

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Advantages



- **Full IEC 61850 (client) standard compliance**
- **Tested with Areva, ABB, GE, Siemens, SEL, and others**
- **Scalable: > 100 devices on a single system**
- **High performance: SEL-3351 12% CPU with 75 IED's connected**
- **Offline configuration – CID & SID files, Device replication**
- **Intuitive User Interface**
- **Rapid development – virtually no setup is required**

Advantages



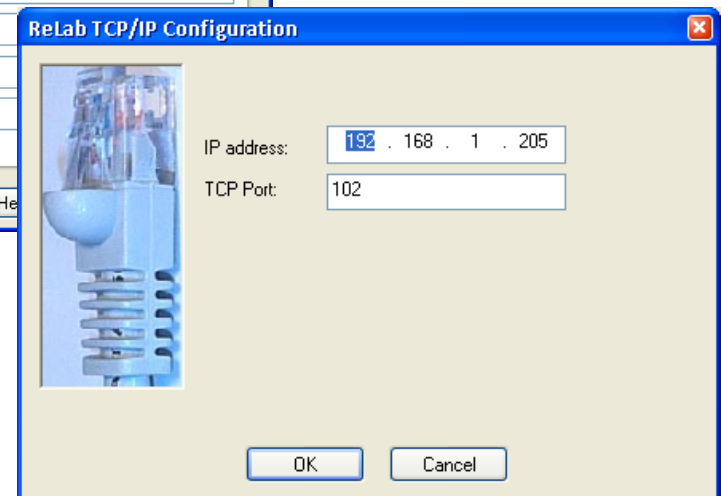
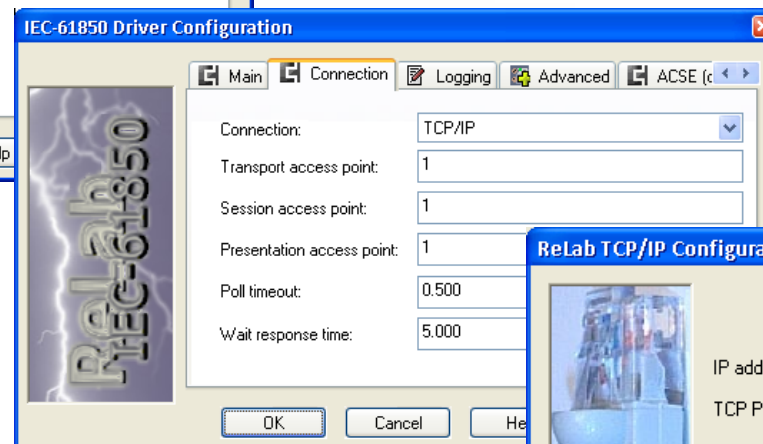
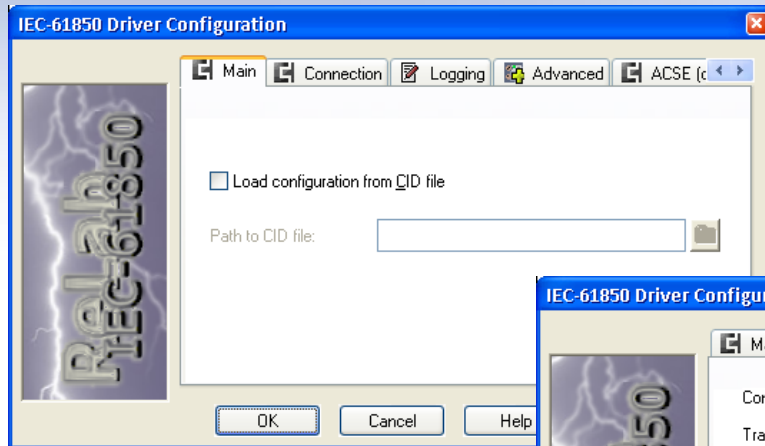
- **Simultaneous Poll & Buffered/Unbuffered reporting**
- **Guaranteed delivery of Buffered/Unbuffered reports (up to 4ms)**
- **All MMS writes are supported (single bit write)**
- **MMS timestamps and qualities are reported to OPC items**
- **Simple GOOSE configuration**

Special Features



- **Monitoring of OPC client load**
- **Substitution of item timestamp with MMS message timestamp when device is incapable of delivering item timestamp**
- **Device item quality substitution when device is incapable of delivering item qualities**
- **Fully configurable ACSE parameters for certain non-compliant devices**

Rapid Development



Buffered & Unbuffered Reports



ReLab OPC Console (Active Server Configuration: F:\ReLab\Projects\ecVServer Config\OPC_Confi...)

File Configure View Tools Help

Configuration Dashboard

Full Name	Tag Name	Value
RL61850_3.RL421PRO.BK1CXCBR3.ST\$Loc\$stVal	ST\$Loc\$stVal	False
RL61850_3.RL421PRO.BK1CXCBR3.ST\$OpCnt\$stVal	ST\$OpCnt\$stVal	0
RL61850_3.RL421PRO.BK1CXCBR3.ST\$Pos\$stVal	ST\$Pos\$stVal	0
RL61850_3.RL421PRO.BK1CXCBR3.ST\$BlkOpn\$stVal	ST\$BlkOpn\$stVal	False
RL61850_3.RL421PRO.BK1CXCBR3.ST\$BlkCls\$stVal	ST\$BlkCls\$stVal	False
RL61850_3.RL421PRO.BK1CXCBR3.ST\$CBOpCap\$stVal	ST\$CBOpCap\$stVal	0
RL61850_3.RL421PRO.BK1CXCBR3.CF\$Mod\$ctlModel	CF\$Mod\$ctlModel	0
RL61850_3.RL421PRO.BK1CXCBR3.CF\$Pos\$ctlModel	CF\$Pos\$ctlModel	0
RL61850_3.RL421PRO.BK1CXCBR3.CF\$BlkOpn\$ctlModel	CF\$BlkOpn\$ctlModel	0
RL61850_3.RL421PRO.BK1CXCBR3.CF\$BlkCls\$ctlModel	CF\$BlkCls\$ctlModel	0
RL61850_3.RL421PRO.BK1CXCBR3.DC\$NamPlt\$vendor	DC\$NamPlt\$vendor	
RL61850_3.RL421PRO.BK1CXCBR3.DC\$NamPlt\$swRev	DC\$NamPlt\$swRev	
RL61850_3.RL421PRO.BK1CXCBR3.DC\$NamPlt\$d	DC\$NamPlt\$d	
Reports.RP\$URep01\$RptEna	RP\$URep01\$RptEna	True

02/18/10 18:21:04.531 Console (008B2AB8) connected
02/18/10 18:21:04.640 Client (008B2AB8) added group "CVOPCConsole"
02/18/10 18:21:05.281 ReLab IEC-61850 Device Driver is registered

Ready

MMS Write Management



ReLab OPC Console (Active Server Configuration: F:\ReLab\Projects\CVServer Config\OPC_Config\OPC_Config.cvd)

File Configure View Tools Help

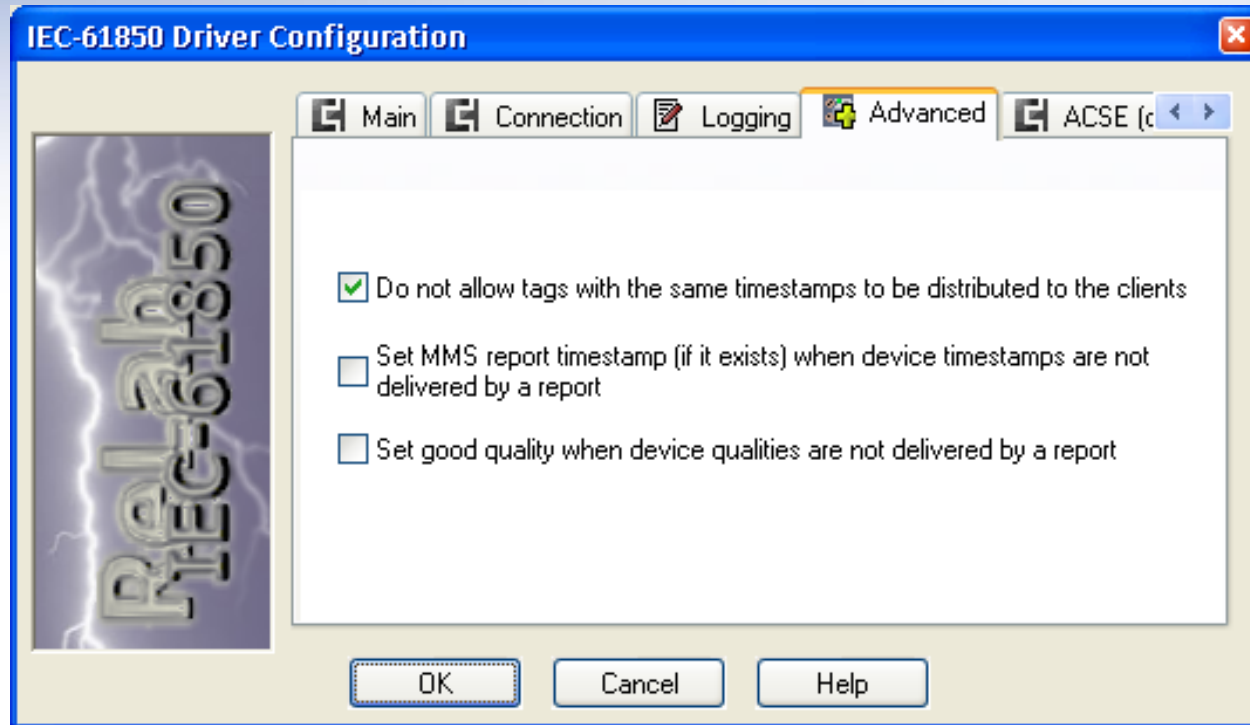
Configuration Dashboard

Full Name	Value
RL61850_3.RL421PRO.BK1CXCBR3.CF\$Pos\$ctlModel	0
RL61850_3.RL421PRO.BK1CXCBR3.CF\$BlkOpn\$ctlModel	0
RL61850_3.RL421PRO.BK1CXCBR3.CF\$BlkCls\$ctlModel	0
RL61850_3.RL421PRO.BK1CXCBR3.DC\$NamPlt\$vendor	
RL61850_3.RL421PRO.BK1CXCBR3.DC\$NamPlt\$swRev	
RL61850_3.RL421PRO.BK1CXCBR3.DC\$NamPlt\$d	
Reports.RP\$URep01\$RptEna	True
Write.ST\$SPCSO01\$stVal	True
Write.RL421CON.RBGGIO1.CO\$SPCSO01\$Oper\$ctlVal	True
Write.RL421CON.RBGGIO1.CO\$SPCSO01\$Oper\$origin\$orCat	3
Write.RL421CON.RBGGIO1.CO\$SPCSO01\$Oper\$origin\$orIdent	ReLab MIKES_RL_SONY\MShulim
Write.RL421CON.RBGGIO1.CO\$SPCSO01\$Oper\$ctlNum	2
Write.RL421CON.RBGGIO1.CO\$SPCSO01\$Oper\$Test	False
Write.RL421CON.RBGGIO1.CO\$SPCSO01\$Oper\$Check	0

02/18/10 18:21:04.531 Console (008B2AB8) connected
02/18/10 18:21:04.640 Client (008B2AB8) added group "CVOOPCConsole"
02/18/10 18:21:05.281 ReLab IEC-61850 Device Driver is registered
02/18/10 18:59:27.234 Mapping complete: Server mapped 6 items, Console read 8 items and created 6 test items.

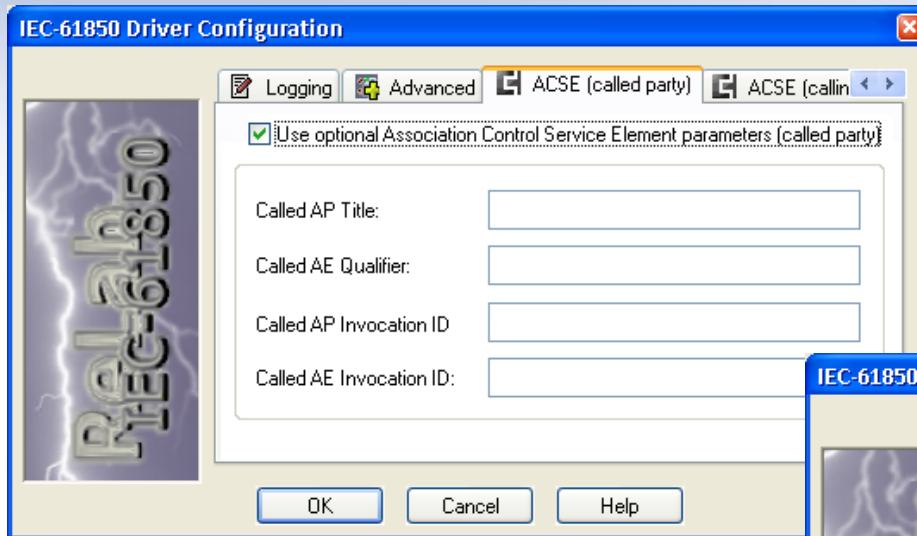
Ready

Advanced Features Implementation



- **OPC clients management**
- **Timestamp substitution**
- **Quality substitution**

Special Features Implementation



IEC-61850 Driver Configuration

Logging Advanced ACSE (called party) ACSE (calling party)

☒ Use optional Association Control Service Element parameters (called party)

Called AP Title:

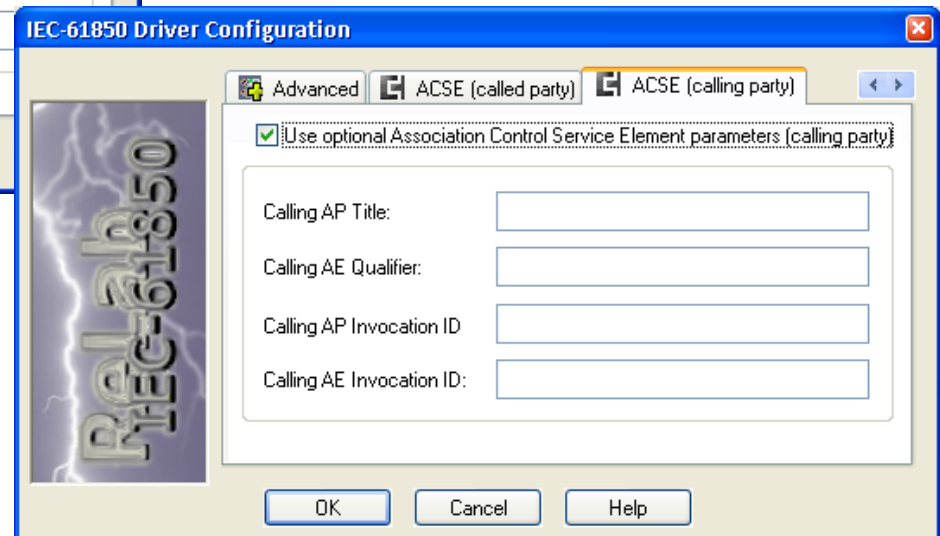
Called AE Qualifier:

Called AP Invocation ID:

Called AE Invocation ID:

OK Cancel Help

- ACSE Called Party Parameters
- ACSE Calling Party Parameters



IEC-61850 Driver Configuration

Advanced ACSE (called party) ACSE (calling party)

☒ Use optional Association Control Service Element parameters (calling party)

Calling AP Title:

Calling AE Qualifier:

Calling AP Invocation ID:

Calling AE Invocation ID:

OK Cancel Help

Best Practices & Performance

Typical Substation Configuration



- **50 IED's Substation System (RL61850 single instance)**
- **100 points per IED (5,000 items total)**
- **Buffered & Unbuffered reports configuration**
- **Computer System CPU 1GHz, RAM 1GB**
- **CPU Usage <10% - normal operating conditions**
- **CPU Usage under major event conditions <25% (~ 4,000 item update)**

Best Practices & Performance

Large Substation Configuration



- **80 IED's Substation System (RL61850 single instance)**
- **100 points per IED (8,000 items total)**
- **Buffered & Unbuffered reports configuration**
- **Computer System CPU 1.2GHz, RAM 2GB**
- **CPU Usage <15% - normal operating conditions**
- **CPU Usage under major event conditions <30% (~ 7,000 item update)**

Best Practices & Performance

Enterprise Solution Configuration



- **200 IED's Enterprise System (RL61850 single instance)**
- **100 points per IED (20,000 items total)**
- **Buffered & Unbuffered reports configuration**
- **Computer System CPU 2 x 3GHz, RAM 4GB**
- **CPU Usage < 20% - normal operating conditions**
- **CPU Usage under major event conditions <40% (~18,000 item update)**

Best Practices

OPC Client Configuration



- **When it is applicable Buffered/Unbuffered reports should be used to limit traffic to OPC Client**
 - **All data is reported in OPC Data Change Event (OPC 2.0) and therefore OPC synchronous or asynchronous reads are not required**
 - **The OPC Client needs to support data arrays (OPC 2.0) in order to process MMS unsolicited reporting**

Best Practices

OPC Client Configuration



- **OPC Group Update interval should be set to less than the RL61850 driver poll time**
- **Unlimited number of OPC clients can be connected to OPC Server**
- **Only one OPC Client is capable of enabling Buffered/Unbuffered reports. Multiple OPC Clients are capable of receiving unsolicited IEC 61850 reports**