

GF4600 IEC 61850 TESTING SOFTWARE

GF4600-IEC61850 protocol conformance testing system software applies in the electric power system of smart grid as test tools. It is compliance to the international IEC61850 and national standard DL/T860 technical requirements. IEC 61850 Testing Software uses friendly interactive graphical interface, easy to operate. Users need to grasp the concept of a few IEC61850, then can use well of this test tool. The software test system can fully comparable with the Netherland KEMA IEC61850 conformance testing software. It include Check Model, MMS server simulation, MMS client test, Model dynamic conformance testing, Goose simulator, smv simulator, Network packet sniffers, sntp server.





Check Model

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Intelligent substation has widely adopted IEC 61850 standard communication, the standardization of information model is the basis for intelligent substation equipment (or system) to achieve IEC 61850 communication. This module can test if the information model meet the requirements of DL/T860 standard, national network and related model specifications. It can test and control unit model, protection unit model, econometric model, condition monitoring model. It is selectable to test according to IEC61850-6 SCL grammatical rules, IEC61850-7 logic nodes and common data, the national network model standards and custom models.

According to 61850-10 rules, this software is to confirm whether the tested product meet the standards on consistency requirements.

Serial Number: 1

IEC XSD	XSD_1.4(2003) -	SCL File D:	ljjwok\english\	WinIec_EN\Relez	Check Model
Log	XML				
ALL Log					
2015-04-13 13:51 2015-04-13 13:51	12 NOVA , RINATAL 22 node Atribute:13 22 node i EnnwYal 22 node i EnnwYal 22 node i EnnwYal 22 node i EnnwYal 22 node Atribute:16 22 node i EnnwYal 22 node i EnnwYal 22 node i EnnwYal 22 node i EnnwYal 22 node Atribute:0 22 node Atribute:10 22 node Atribute:10 22 node Atribute:10 20 node Atribute:11 20 node Atribute:11 20 node Atribute:11				ŕ
S Error Los					

IEC61850MMS client test

Simulated client IEC61850, testing intelligent electronic devices IED (the control unit, the protection unit etc.). Testing the IED directory tree, IED associated equipment, servers, logical devices, logical nodes and data, data sets, replacing, reporting, setting the group control, recording, controlling and other functions.

Directory	DateSet 2007	SGVelues Contr		File Log	GOOSE BA	f SWY								
IED Info				Directory	DataSet	Report	SGValues	Control	Sub	File	Log	GOOSE Ref	SV Ref	Data Lo
Remote_ID	IP_A	IP_B	status	Name				value			e	dit		type
remote1	127.0.0.1	192.168.2.251	net=0 ne	4 🚮 remi	ote1									
remote3	192.168.0.188	127.0.0.1	net=0 ne		1Q15B1C1									
remote5	198.120.0.109	127.0.0.1	net=0 ne		N CSWI1									
			FC ST											
				1	00 <u>31</u> 0									
					FC CF									
				. 9	FC DC									
					FC SV									
					FC EX									
				Þ L	GL1_PTO	C1								
			+	P B	N LLNO									
remotel Anet	127. 0. 0. 1	3 Layer		Þ	N LPHD1									
C	reate MMS Tree	Associat	Release	Þ	MMXU1									
		Associat	Abort	ÞL	N SPPOPFI									
				4									-	,
lessage Log														6
ished get dat eate data bas mote1 create	Entry 'E1Q1SB1C1 LL taset entry for each se finished! mms variables tree E1Q1SB1C1 CSW15	dataset successi												



IEC61850MMS server simulation Serial Number: 3

GFUVE

Simulated server IEC61850, testing back-office systems and far motivation systems of intelligent substation. According IED and ICD files, simulating MMS server to achieve the directory tree, logical devices, logical nodes, data reading and writing, data sets, valuation, reporting, replacing and other functions.

Simulator(MMS Server)				
📄 settings ICD 🔯	settings state 🥜 view con	nnection D Run	[]] Stop	
Name	value	type	byte	
IED_SERVER				
ID TEMPLATEPROT				
▷ LN LLNO				
D IN LPHD1				
IN HiSetPDIF1				
PetDifPDIF1				
HiSetPDIF2				
PetDifPDIF2				
PctDifPDIF3				
D LN PctDifPDIF4				
D IN ZerPDIF1				
IN HPP1PDIS1				
g info				
-	roupno: return *sg_grp_num=1 pforSG: group_num=1			
unning	The server state:normal stat	•		

GOOSE simulator

Simulation issue event message IEC61850-GOOSE, testing if the operation of the IED is correct. You can configure Priority, Dest MAC Address, VLanID, Source MAC Address, APPID, timetoLive, gocbRef, datSet, goID, test, confRev, numEntries, GOOSE data formats and other parameters. Simulation receive event message IEC61850-GOOSE, testing if the issued GOOSE of the digital device IED is correct.

Recognition IEC61850-GOOSE message, setting the message format, displaying Goose in graphical data

1110 2000000	ck Driver((De	VICEUMPE	{5D369162-CDDD-45A6-B1	24-2CD/84E//8	· •	start	stop	view packet
and timespan T0	250	÷	т1 5	T2 1	0		T3 50	-
arams		-1						
	Priority	4	•	Dest MAC A	ddress	01-00-00	D-01-00-00	•
	VLanID	0		Source MAC A	ddress	00-01-0	2-03-04-05	•
	APPID	0x0000			toLive	10000		
	APPID	Toxoood		time	tolive	110000		
	gocbRef	mytest	_gocbRef	da	ataSet	mytest_	datSet	
	doID	mytest	goID		test	True		-
					onfRev	1		
						1-		
hannel data -								
	numEntries	8	<u>.</u>	GOOSE F	Format	stVal,q,t		-
channel	desc		data format	single point	qualit	y I	time	
01	switch va	lue 01	Bool, BVString13, Utctime	0	0x000	00	NULL	
02	switch va		Bool, BVString13, Utctime		0x000	00	NULL	
03	switch va		Bool, BVString13, Utctime		0x000		NULL	
04	switch va		Bool, BVString13, Utctime		0x000		NULL	
05	switch va		Bool, BVString13, Utctime		0x000		NULL	
06	switch va		Bool, BVString13, Utctime		0x000		NULL	
07	switch va		Bool, BVString13, Utctime		0x000		NULL	
08	switch va	lue 08	Bool, BVString13, Utctime	0	0x000	00	NULL	



SMV simulator

Simulation issue sampled value message IEC61850-9-1 or IEC61850-9-2 (LE), testing the digital device IED. You can configure Priority, Dest MAC Address, VLanID, Source MAC Address, APPID, datSet, svID, confRev, SMV data formats and other parameters. Simulation receive sampled value message IEC61850-9-1 or IEC61850-9-2 (LE), testing if the issued message of digital merger unit is correct.

Recognition IEC61850-9-2 (LE) message, setting the message format, displaying SMV in graphical data.

Serial Number: 5

network				
4.Atheros L1C PCI-E	Ethernet Controller(\Dev	rice\NPF_{D550BC64-391	7 -	Start stop view pac
params				
Priority	/ 4	Dest M/	AC Address	01-0C-CD-04-00-01 💌
VLanII	0	Source MA	C Address	00-01-02-03-04-05 💌
APPI	0x4000		dataSet	mydataset
svII	0 mysvID		confRev	1
smpSyncl	True	•	smpRate	10000
channel	5 8	* *	ASDU NUM	1
channel Information				
smv analog channel	channel desc	quality factor		
01	analog channel 01	0x0000		
02	analog channel 02	0x0000		
03	analog channel 03	0x0000		
04	analog channel 04	0x0000		
05	analog channel 05	0x0000		
06	analog channel 06	0x0000		
07	analog channel 07	0x0000		
08	analog channel 08	0x0000		
				create smy packet

IEC61850MMS dynamic conformance testing

Software test if the CID / ICD files and intelligent substation IED device implementation model is consistent, simple and flexible, the features are following:

1) Use the XML parser reads and parses the CID / ICD files and extract model information;

2) Import the IP address of MMS server at the interface, use the MMS client mode to communicate with the tested IED device, read layers of the model information of the tested IED device online by ACSI model service

3) Compared the information from 1) and 2), you can check if the CID / ICD files and intelligent substation IED device implementation model is consistent.

IED IP	127 . 0 . 0 . 1	
IED SCL	D:/temptest/IEC61850/CheckIED/scl.xml	Select SCL
	E1915 Dynamic Check ICD S1 Dynamic Conformancet	mie Check ICD
1fo		8



Network packet sniffers

GFUVE

Network packet sniffers, in-depth analysis of network protocol message such as MMS, goose, SMV etc., showing the real MMS interaction.

Monitoring substation network, capturing and analyzing IEC 61850 information, and can be used for acceptance testing, interoperability testing, conformance testing, error logs and network performance monitoring, support IEC 61850 products development.

Serial Number: 7

IED list			ction info	packet statistics	GOOSE	SV other packet	packet file query	
📝 🎟S 🛛 GOOSZ 🔍 SV			and action in		60055	other packet	packet file query	
sens · IED filter		export	link filt					
🖻 🚞 packet analyse			capt	ture time	warn num		desc	link r
- 🦨 mytest_gocbRef->(0x0000)	1	•	2015-04-13	16:19:39.434203	1	GOOSE lose conn	ection(last time:2015-0	mytest_g
	2	•	2015-04-13	16:19:22.899107	1	GOOSE change p	os(last time:2015-04-13	mytest_g
	3	•	2015-04-13	16:19:14.412507	1	GOOSE change p	os(last time:2015-04-13	mytest_g

SNTP Server

Testing 61850 time synchronous with SNTP service.

PC's Time:	2014-09-05 15:10:54,893
Port.	1234
Add Hr (Min):	
SNTP server time.	2014-09-05 15:10:54.893



IEC61850 auto test

Simulated client IEC61850, automatic testing intelligent electronic devices IED (the control unit, the protection unit etc.), according to predetermined test (IEC61850-10), exporting the test results to a variety of file formats (word, pdf, html, xml). Can automated test based on ICD / CID files.

💽 Open 📄 Start 😵 Stop								
IED list	NATE	and a	tion info	packet statistics	GOOSE	SV other packet	packet file query	
V WHS V GOOSE V SV	411	vara a	nd action in	formation				
sens · IED filter		sport	link filt	er				
∃ [™] packet analyse			capt	ure time	warn num		desc	link
	1	•	2015-04-13	16:19:39.434203	1	GOOSE lose conn	ection(last time:2015-0	mytest_g
	2		2015-04-13	16:19:22.899107	1	GOOSE change p	os(last time:2015-04-13	mytest_g
	3	•	2015-04-13	16:19:14.412507	1	GOOSE change p	os(last time:2015-04-13	mytest_g