



ELDES**KFA310 Relay Test Set**

Item	KFA310	Remark
Voltage	4x300V	
Accuracy	$< \pm 0.02\%rd + 0.03\%rg$	
Voltage Power	22.5VA Max	
Current range	0-10A, LN 0-20A, LL-N 0-30A, LLL-N	Optional upgrade current range to 3x0~20A LN Max 0~50A LLL-N
Current Power	130VA Max	
Phase	0° ~360°	
Frequency	10-1000Hz	
Harmonic	2~60th	
GPS, IRIG-B	Support	
Binary IN/OUT	4 Binary IN/OUT	
USB Port	1*USB3.0	
WIFI, Blue Tooth	Support	
Low-Level Output	Support	
Energy Meter	Support	

Total Function

Special Points

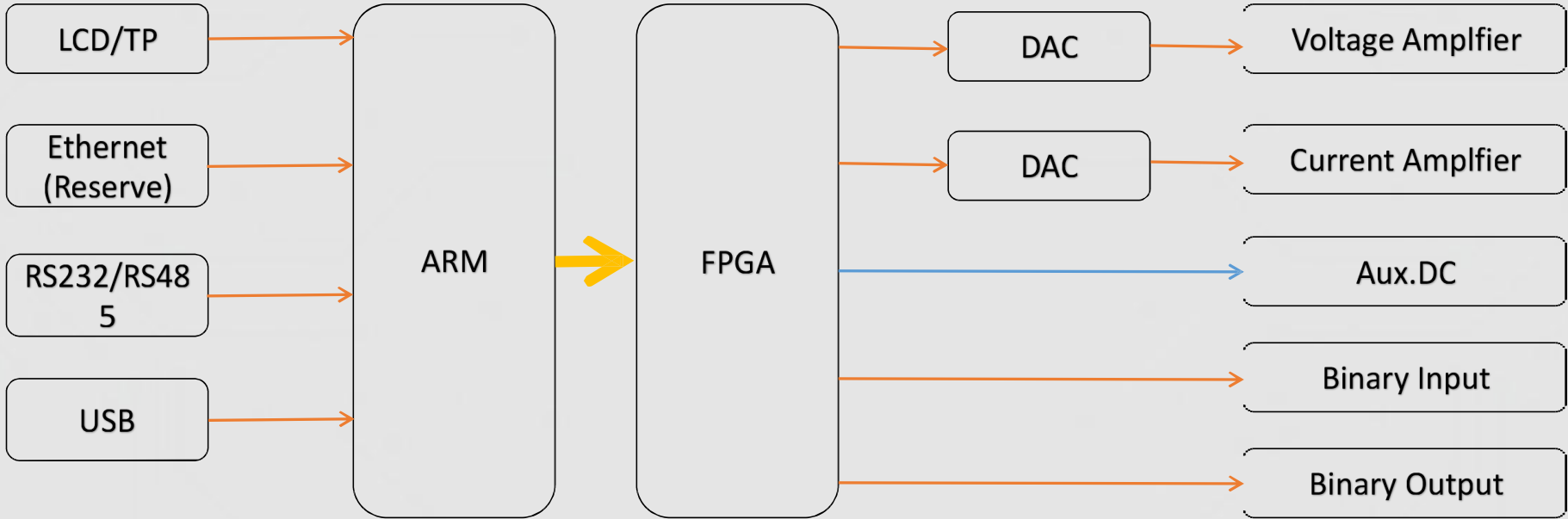
B5 paper size, **built-in battery design**, for on-site maintenance and testing of **non-electric environment**, protection relay testing, secondary circuit inspect and secondary voltage and current testing.



Technical Benifit

- Device Size: IPAD size, aluminum alloy case, Very small and light.
- Device Weight: 3.7kg ,Beautiful and light, easy to carry and use.
- Operational performance: high-performance FPGA, 32-bit ARM microprocessor 1000MHz, smooth operation, 7.0-inch LED capacitive touch screen, full touch operation, mobile phone operation habits, display light transmission, non-reflective contrast, clear display for outdoor
- Equipment self-protection function: voltage output short-circuit, current output open-circuit, temperature overheat protection.







AC Voltage Outputs		
Output Range & Power	4x300 V ac (L-N)	22.5 VA max each@300V
		21 VA max each@200V
		12.5 VA max each@100V
		7 VA max each@63.5V
		6.65 VA max each@57.7V
		1.1 VA max each@10V
Accuracy	<0.015%Rd+0.005%Rg Typ. <0.02%Rd+0.03%Rg Guar.	
Resolution	0.001V	
DC Offset	<5mV Typ. <60mV Guar	
Distortion	<0.05%Typ. / <0.1% Guar.	
Ascends/Descent response	<100us	
DC Voltage Outputs		
Source Channels	4	
DC voltage output range	0~300 V (L-N)	
DC voltage output power	22.5W Max	
DC voltage accuracy	<0.03%Rd+0.01Rg Typ. <0.04%Rd+0.06Rg Guar.	
Ascends/Descent response	<100us	
Resolution	1mV	



AC current outputs	
Source Channels	3
AC current output range	0~10A, L-N / (Can be optional as 0~20A)
	0~20A, LL-N / (Can be optional as 0~40A)
	0~30A, LLL-N / (Can be optional as 0~50A)
AC current output power (Max)	75VA Max for 10A L-N/130VA Max for 20A L-N/LLL-N
AC current output accuracy	<0.015%Rd+0.01%Rg Typ. <0.02%Rd+0.03%Rg Guar.
DC Offset	<1mA Typ. <2mA Guar
Distortion	<0.05%Typ. / <0.1% Guar.
Ascends/Descent response	<100us
Resolution	1mA
DC current outputs	
Source Channels	1
DC current output range	0~10A, L-N
DC current output power	138W
DC current accuracy	<0.03%Rd+0.01Rg Typ. <0.04%Rd+0.06Rg Guar.
Resolution	1mA

Binary input and time accuracy	
Binary input logarithm	4 pairs
Trigger mode	Try/Wet contact
Input voltage range	0 V~300Vdc
Timing accuracy	$< \pm 1\text{ms} @ 0.001\sim 1\text{s}$, $< \pm 0.1\% @ >1\text{s}$
Timing resolution	36us
Max time limit	infinity

Binary output(Relay Contacts)	
Binary output pairs	2pairs(DO-1 and DO-2)
Type	Potential free relay contacts, software controlled
Break capacity AC	Vmax: 380V (AC) / Imax: 8A/ Pmax: 2000VA
Break capacity DC	Vmax: 240V (DC) / Imax: 5A/ Pmax: 150W
Response time	$\leq 10\text{ms}$
Binary output(Fast eSSR)	
Binary output pairs	2pairs(DO-3 and DO-4)
Circuit Breaker Simulate	Can be define as Open or Close status
Break capacity AC	Vmax: 250V (AC) / Imax: 0.5A
Break capacity DC	Vmax: 250V (DC) / Imax: 0.5A
Response time	$< 100\mu\text{s}$
Contact performance	Open the dry contact output using opto-coupler relay, the max on-resistance is $\leq 6\Omega$ (Typically $\leq 1\Omega$), and the shut-off withstand voltage is $\geq \text{DC}300\text{V}$



Hardware Introduce

GPS Port
 Can connect to external antenna, for end-to-end test on line differential or other synchronize testing.
 When GPS synchronize works, LED beside port will light up.

Serial port
 For debugging

Low level outputs	
Number of outputs	8
Setting range	0~8Vrms
Max. output current	Rating 2mA, 10mA transient max.
Accuracy	(0.01~0.8 Vrms): <0.05% Typ. / <0.1% Guar. (0.8~8 Vrms): <0.02% Typ. / <0.05% Guar.
Resolution	250 μ V
Distortion (THD+N)	< 0.05% Typ. / <0.1% Guar.
Connection interface	Phoenix terminal



IRIG-B Synchronization Port	
Port define	Use for IRIG-B synchronize, or can be set as time clock source.
Time accuracy	5us

Energy Pulse Port	
Sensor Usage	Mechanical meters / Electronic meters
Sensor Output	High level:>4.5V, Low level:<0.2V
Pulse Input	1 pulse input port, 5Vdc high level valid only.
Pulse Range	500KHz pulse input Max.
Pulse Output	1 Transistor output, Open-collector, 5Vdc/5mA

USB
 USB Port 3.0, use for report upload and software update.

Communication	
RJ45 (Reserve)	Ethernet port, TCP/IP protocol, use for communication with PC for operation control

Ext	
Data bus	Use for hardware function extension, such as Binary input/output numbers, external measurement, LVPT, LPCT testing.



Power switch
Power on or power off device

Aux. DC	
Use for power supply of under test device.	
Output range	12~350V
Output power	40W max
Accuracy	<1%

Grounding port
Use for grounding

AC/DC Charger	
Input	100~240Vac, 50/60Hz, Max2.5A
Output	33.6Vdc, 5.0A (168W)

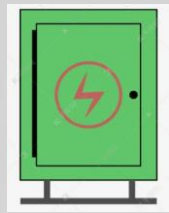


Dimensions(W x D x H):288x185x95 (mm)

3.7Kg



Extremely light



Distribution test



Oil and Gas
Platforms



Substations



Industry



Photovoltaic plants

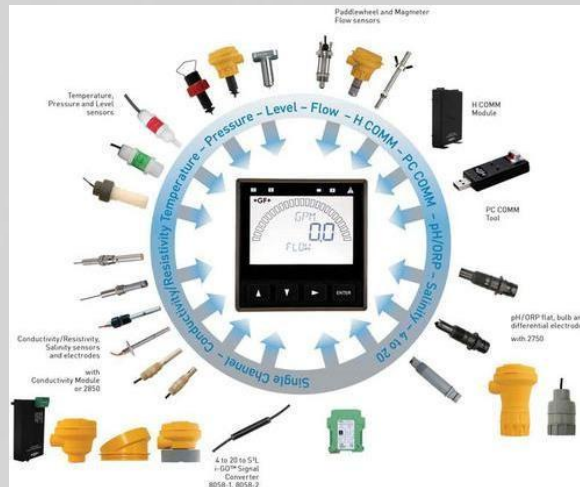


Rail and Metro



Wind Farm

Standard source



Because the output signal of KFA310 has high precision and high stability, it can be used as a 3-phase standard and a calibration signal source for instruments.

We KFA310 Support two sets of software which can switch by user, in different testing environment of substation and distribution.

Substation Test Software interface



Distribution Test Software interface



Substation Test Software interface

AC test module interface

2022-09-08 10:52:34 AC Test

UA:	57.735 V	0.000 °	50.000 Hz
UB:	57.735 V	240.000 °	50.000 Hz
UC:	57.735 V	120.000 °	50.000 Hz
IA:	1.000 A	0.000 °	50.000 Hz
IB:	1.000 A	240.000 °	50.000 Hz
IC:	1.000 A	120.000 °	50.000 Hz

Parameter Setting

Start: 0.000 V +

End: 57.735 V -

Step: 1.000 V

Auto 1.000 s

Variable: UA

TestItem: Amplitude

Mode: From-to

Trip Value

Trip Time

Return.Coeff

Calc

Start DI:1 2 DO:1 2 Report

Fault-Calc

Fault Parameter	Short-Circuit Impedance
Mode Const I	Fault-I 1.000 A
F-Type A-N	Load-I 0.000 A
CT Dir. Line	Load-θ 0.000 °
PT Dir. Line	
Fault Dir. Forward	
	Z 0.000 Ω R 0.000 Ω
	θ 75.000 ° X 0.000 Ω
	Grounding Factor
	Mode KL
	KL Range 0.670
	KL Angle 0.000 °

OK Cancel

Substation Test Software interface

Distance module interface

2022-09-08 10:57:14 Distance

Parameter	Setting	UA	UB	UC	IA	IB	IC
Z	0.000 Ω	0.000V	57.735V	57.735V	1.000A	0.000A	0.000A
θ	75.000 °	0.000°	240.000°	120.000°	0.000°	0.000°	0.000°
R	0.000 Ω						
X	0.000 Ω						

Add
 Delete
 Clear

Fault: A-N
 Fault Dir.: Forward
 Time: 1.000 s

Impedance Factor
 0.70 0.95 1.05 1.20

Test Result

Fault	Fault Dir.	Z	Zθ	T.nom	Dev	Trip Time	DI	Result

Start DI:1 2 DO:1 2 Report

2022-09-08 10:57:29 Distance

Parameter	Setting
Mode	Const I
Fault-I	1.000 A
Grounding	KL
CT Dir.	Line
Load-I	0.000 A
KL Range	0.670
PT Dir.	Line
Load-θ	0.000 °
KL Angle	0.000 °
T.Prefault	3.000 s
T.Interval	1.000 s

Start DI:1 2 DO:1 2 Report

Substation Test Software interface

Ramping module interface

2022-09-08 10:58:05 Ramping

Voltage	Current	Parameter Setting
UA: 0.000 V	0.000 °	50.000 Hz
UB: 57.735 V	240.000 °	50.000 Hz
UC: 57.735 V	120.000 °	50.000 Hz
Start: 0.000 V	End: 57.735 V	
Step: 1.000 V	Time: 1.000 s	
Variable: UA	TestItem: Amplitude	
Mode: Phase	Function: 50	
<input type="checkbox"/> T.Prefault: 1.000 s	<input type="checkbox"/> Output Once	
<input type="checkbox"/> T.Interval: 0.200 s	<input type="button" value="Add"/> <input type="button" value="Delete"/>	

Test Result

Variable	Function	T.nom	Dev	Trip Time	DI	Result

Start DI:1 2 DO:1 2 Report

Harmonic test module interface

2022-09-08 10:57:43 Harmonic

Order: 1 [1/5]

Setting
UA: 57.735 V
UB: 57.735 V
UC: 57.735 V
IA: 1.000 A
IB: 1.000 A
IC: 1.000 A
Start: 0.000 V
End: 57.735 V
Step: 1.000 V
<input checked="" type="checkbox"/> From-to
<input type="checkbox"/> Auto 1.000 s
Order: 1
Variable: UA
TestItem: Range
THD: <input checked="" type="radio"/> Amplitude <input type="radio"/> Percentage
T.nom: 1.000 s
Dev: 0.100 s

Test Result

Variable	T.nom	Dev	Trip Time	DI	Result
UA	1.000s	0.100s			NoTest

Start DI:1 2 DO:1 2 Report

Substation Test Software interface

Overcurrent module interface

2022-09-08 10:58:25 Overcurrent

Parameter Setting

Time Overcurrent(50)	Inst. Overcurrent(51)	Test Point
Pick-up: 1.000 A Time Dial: 1.000 s	Pick-up: 1.000 A Time Dial: 1.000 Curve: IEC-NI	I-test: 0.000 A Function: 50 FaultType: A-N
		Add Multi

Test Result Delete Clear

FaultType	ABS	Function	T.nom	T.min	T.max	Trip Time	DI	Result

Start DI:1 2 DO:1 2 Report

2022-09-08 10:58:49 Overcurrent

Parameter Setting

Current Tol: 5.000 % Time Tol: 5.000 % Max Fault Time: 200.000 s	<input checked="" type="checkbox"/> T.Prefault: 0.500 s <input type="checkbox"/> Output Once <input checked="" type="checkbox"/> T.Interval: 0.200 s	<input checked="" type="checkbox"/> OC Directional V.Fault L-N: 30.000 V Current Angle: -60.000 °
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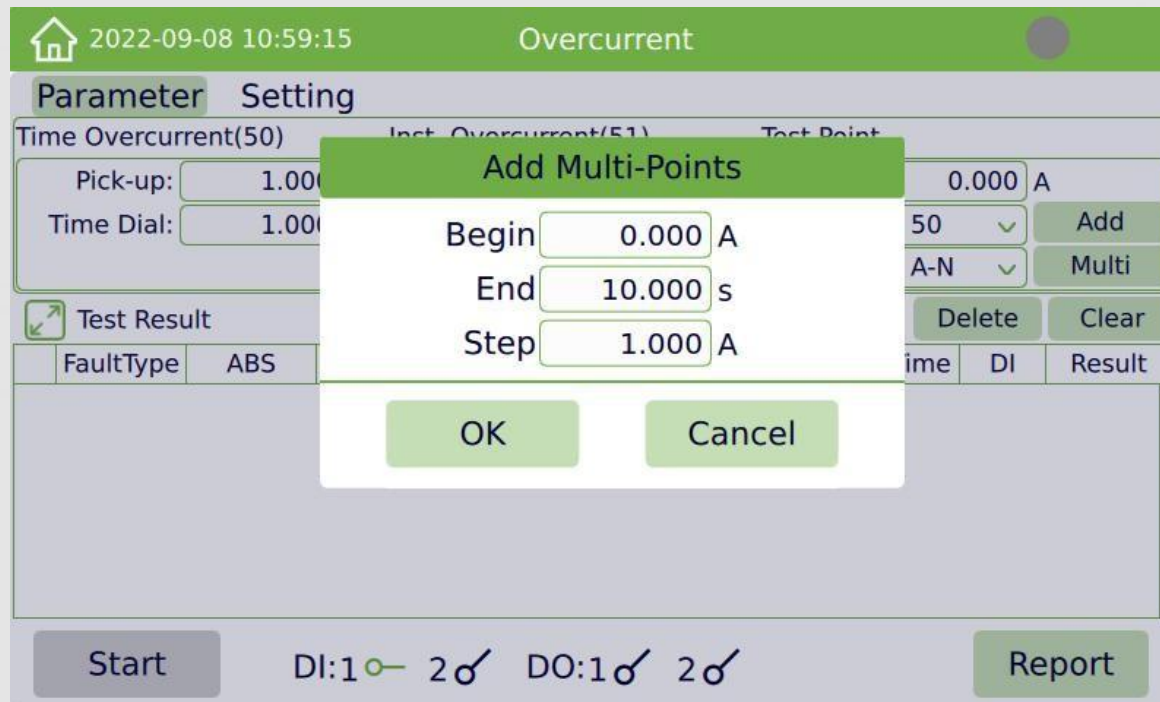
Test Result Delete Clear

FaultType	ABS	Function	T.nom	T.min	T.max	Trip Time	DI	Result

Start DI:1 2 DO:1 2 Report

Substation Test Software interface

Overcurrent module interface



Substation Test Software interface

State Sequencer module interface

2022-09-08 10:53:21 Sequence

State [1 / 3]

Voltage **Current**

UA: 57.735 V 0.000 ° 50.000 Hz
 UB: 57.735 V 240.000 ° 50.000 Hz
 UC: 57.735 V 120.000 ° 50.000 Hz

Trip: Time
 Angle: Phase
 Time: 1.000 s
 Logic: And Or
 DI: 1 2
 DO: 1 2

Calc

Test Result Assessment

State	DI 1	DI 2
1	NoTest	NoTest
2	NoTest	NoTest
3	NoTest	NoTest

Start DI:1 2 DO:1 2 Report

2022-09-08 10:53:45 Sequence

State [1 / 3]

Voltage **Current**

IA: 1.000 A 0.000 ° 50.000 Hz
 IB: 1.000 A 240.000 ° 50.000 Hz
 IC: 1.000 A 120.000 ° 50.000 Hz

Trip: Time
 Angle: Phase
 Time: 1.000 s
 Logic: And Or
 DI: 1 2
 DO: 1 2

Calc

Test Result Assessment Add Delete Clear

	Start	Stop	T.nom	Dev	Act Time	Result

Start DI:1 2 DO:1 2 Report

Substation Test Software interface

Remote module interface

2022-09-08 11:08:43 Remote

Storm Test Resolution Test

Width: ms

Count:

Enable-DI: 1 2

SOE List:
HH:mm:ss:ff SOE event info

Start DI:1 ✓ 2 ✓ DO:1 ✓ 2 ✓ Clear SOE

2022-09-08 11:09:18 Remote

Storm Test Resolution Test

DO1 Width: ms

DO2 Width: ms

Resolution: ms

SOE List:
HH:mm:ss:ff SOE event info

Start DI:1 ✓ 2 ✓ DO:1 ✓ 2 ✓ Clear SOE

Distribution Test Software interface

MultiTest module interface

2022-09-08 11:12:21 Multi Test

UA:	57.735 V	0.000 °	50.000 Hz
UB:	57.735 V	240.000 °	50.000 Hz
UC:	57.735 V	120.000 °	50.000 Hz
IA:	1.000 A	0.000 °	50.000 Hz
IB:	1.000 A	240.000 °	50.000 Hz
IC:	1.000 A	120.000 °	50.000 Hz

SOE List:
HH:mm:ss:ff SOE event info

U	100%	+10%	-10%
I	100%	+10%	-10%

Start DI:1 2 DO:1 2 Clear SOE

Fault Test module interface

2022-09-08 11:12:59 Fault Test

Norm(U,F): 57.735 V 50.000 Hz

Load-I: 1.000 A 0.000 °

Fault-U: 30.000 V

Fault-I: 2.000 A 0.000 °

Max Time: 10.000 s

Pre-Fault: 10.000 s

Fault-DO: 1 2

Trip:

SOE List:
HH:mm:ss:ff SOE event info

Start DI:1 2 DO:1 2 Clear SOE

Distribution Test Software interface

State Sequencer module interface

2022-09-08 11:12:42 Sequence

State [1 / 3]

SOE List: HH:mm:ss:ff SOE event info

UA:	57.735 V	0.000 °	50.000 Hz
UB:	57.735 V	240.000 °	50.000 Hz
UC:	57.735 V	120.000 °	50.000 Hz
IA:	1.000 A	0.000 °	50.000 Hz
IB:	1.000 A	240.000 °	50.000 Hz
IC:	1.000 A	120.000 °	50.000 Hz

DI: 1 2 Time: 1.000 s

Trip:

2022-09-08 10:53:45 Sequence

State [1 / 3]

Voltage Current

IA:	1.000 A	0.000 °	50.000 Hz
IB:	1.000 A	240.000 °	50.000 Hz
IC:	1.000 A	120.000 °	50.000 Hz

Trip: Time

Angle: Phase

Time: 1.000 s

Logic: And Or

DI: 1 2

DO: 1 2

Start	Stop	T.nom	Dev	Act Time	Result

Distribution Test Software interface

Remote module interface

2022-09-08 11:13:32 Remote

Storm Test Resolution Test

SOE List:
HH:mm:ss:ff SOE event info

DO1 Width: ms
DO2 Width: ms
Resolution: ms

Start DI:1 2 DO:1 2 Clear SOE

2022-09-08 11:13:16 Remote

Storm Test Resolution Test

SOE List:
HH:mm:ss:ff SOE event info

Width: ms
Count:
Enable-DI: 1 2

Start DI:1 2 DO:1 2 Clear SOE

Distribution Test Software interface

System Setting module interface

2022-09-08 11:00:47 System

Norm.Volt: V Norm.Curr: A
 Norm.Freq: Hz Deglitch Time: s

System Time:

Theme: Default Blue
 Lanuage: Chinese English Portuguese

Device Type: KFA Software Version: 1.3.0002
 Serial Number: 0000 Firmwre Version: 0.0.0000

2022-09-08 11:04:39 Hardware

Device Type: Temp.Off: °C
 Serial Number: Temp.On: °C

Max Voltage: V Volt.Range: V
 Max Current: A Curr.Range: A

Voltage/Current Output Phase: 3 4