Beyond X™

GIPAM1000

Digital Integrated Protection & Monitoring Equipment

LS ELECTRIC

Multifunction digital power protection monitoring device with various protection elements and measurement elements

Beyond X™ GIPAM1000

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Digital Integrated Protection & Monitoring Equipment

- With 12/24 types of protection elements in 2 models, the distribution system protected
- Enhanced analysis function through various saved event data (up to 1,000 events are saved)
- Select Before Operating(SBO) and Check Before Operating(CBO)
- Vector diagram
- Sequence of Event(SOE)
- PT(VT) failure detection
- Circuit Breaker Failure(CBF)
- Cold Load Pickup(CLP)
- Disk emulation
- Various Remote Communication(MOBUS, DNP, IEC61850)
- Self-diagnosis and sequence monitoring
- HMI with enhanced visibility and convenience
- Long-life and reliable parts applied

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Beyond X™ GIPAM1000

Digital Integrated Protection &
Monitoring Equipment

Beyond X™ GIPAM1000 series are multifunction microprocessor-based protection equipments suitable for all types of application such as distribution feeders and distributed power supply.

It can be also be used for management backup protection of incomings, feeders, high tension motors, Bus, transformers and Generators Over current protection function includes protection elements such as over current, over current ground fault, selective ground fault current, directive ground fault current, negative sequence over current in each phase with regard to time delay or instantaneous elements.

Under voltage protection has a operation function independently of each other, In addition, Simple Logic is built inside, so it is easy to set up not only programmable logic input and output but also user-specific usage, and has extensive monitoring and measurement functions.

It has internal memory to store 1,000 recent events, 200 Faults, and each significant 64 cycles of Fault waveform data.

The convenience features include self-diagnosis while operationg, alarm output function in case of abnormalities, RS-485 for communication with higher systems as well as separate USB 2.0 ports for computer connection, and support MODBUS international standard protocol. The high-resolution 4.3" color graphics LCD make it easy to see the power system with relays, as well as Fault and Event data and Fault waveforms, and Vector Diagram.

The program for PC interface supports a variety of functions, including setting, monitoring, and control of all relay elements.

Features

With 12/24 types of protection elements in 2 models, the distribution system protected

The GIPAM1000 is a total of 12/24 types of protection elements in two models, Feeder/Incoming Protection FI Model and Distributed Power Supply Protection DG Model. Protect various distribution systems.

Enhanced analysis function through various saved event data (up to 1,000 events)

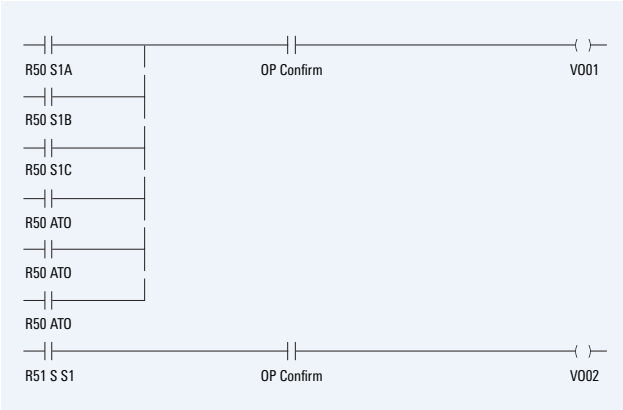
The GIPAM1000 records up to 1,000 events in the relay, including relay behavior, various settings, deletion of records, CB,DI,DO,VO,CC status changes, and all event records can be viewed by using FILTER functions by dividing them into relay settings, status changes, system settings changes, control commands, and device information.

The fault record function is the status of relay operation (Pick Up/ Operation/) among recorded events. Reset) Only the information is extracted separately and stores a total of 200 accident records.

The fault waveform recording function stores the fault waveforms of voltage and current during relay operation for accurate fault analysis in the event of a systematic accident caused by relay operation, and can record up to 16 waveforms.

Trip logic and sequence

The GIPAM1000 has a built-in Simple logic function, so all I/O contacts and relay elements, including Trip Relay, can be operated by a user-generated Trip Logic.
When the relay element is activated, the signal is passed to the input contacts of the PLC and operates according to the program. Sequence, such as interlocks between relay devices or switchboards, can also be easily implemented with PLC.



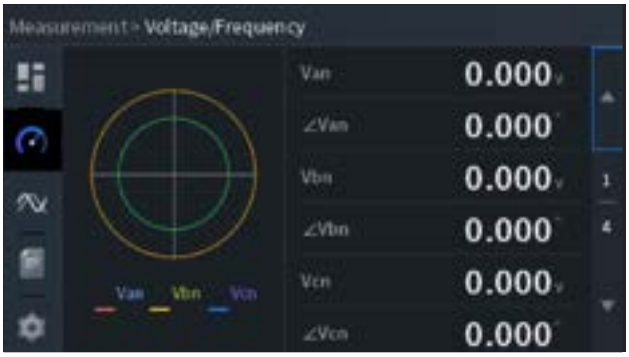
* You can download the latest version of the IED Manager for free from our website.
* IED Manager OS Spec. : MS Windows Vista/ Windows7/ Windows8/ Windows10

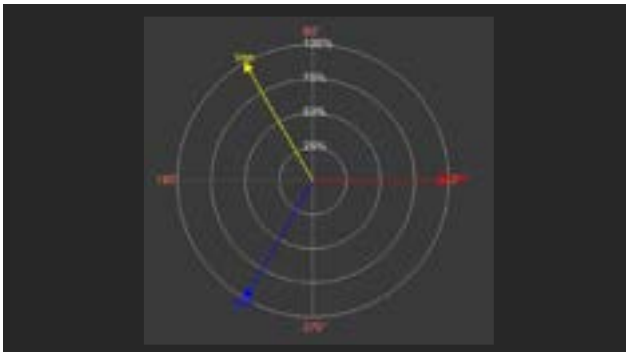
Select Before Operating (SBO) and Check Before Operating (CBO)

By choosing controlling Points first before sending out orders to where it is desired to control, control orders are executed only along with normal responses. This function enhances to control reliability and security.
For selected control point, it will wait for control orders for 5 seconds after its response. If the control order won't be delivered within 5 seconds, it will be reset. The control functions will be executed only on the normal condition when orders were delivered within 5 seconds.

VECTOR DIAGRAM

GIPAM1000 displays Vector Diagram for the voltage, current, and phase of the system. This allows you to check the amount of electricity to easily identify the condition of the system.





Sequence of Event (SOE)

GIPAM1000 supports the SOE function that makes easy for reviewing fault analysis and operation information by recording events in sequence at 1ms' intervals regarding internal protection relay, breaker operation, or self-diagnosis abnormalities such as alarm contact output and others.
These events including the latest registered one can be stored as many as 1,000. Each event can be verified in detail under the "EVENT RECORDS" section from the initial screen of "RECORDS VIEW".
In addition, it is possible to save as files with GIPAM1000 Manager.

PT(VT) failure detection

By detecting PT 2nd fuse melt-down in advance, it's possible to collect alarm message and logic prints which can be used to prevent unnecessary system cutoffs by protection relay operation of UVR and NSOVR. It does not activate under under-voltage or blackout situation, it compares with voltage current and on breaker conditions to decide PT fuse opening. By utilizing DO output, it can generate alarm signal and it can also make Trip Block to disable trip function. Replacing PT fuse will reset it immediately.

Circuit Breaker Failure (CBF)

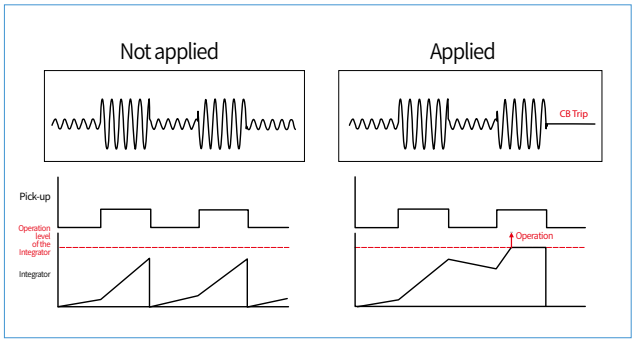
The 50BF is a function that can prevent further extension of accident by controlling upper circuit breaker to trip, when lower circuit breaker failed to act despite protection relay was activated and sent trip signal for problems in the circuit.

In/output port status monitoring

It has Virtual Output(VO) and Control Contact(CC) functions for monitoring the input/output status of the relay. A total of 32 virtual outputs can be set, and VO function is designated as DO to check the incorrect connection of sequence wiring in the switchboard. A total of 16 control contacts can be set, and CC function is used to verify the DO operation and wiring assigned to the relay element and to perform CB control check and communication test.

DISK Emulation

If a ground fault/short circuit occurs due to insulation breakdown due to system aging, the signs of an intermittent accident are repeated several times, leading to a final accident. The Disk Emulation function detects the signs of an initial accident and helps to block it safely before it spreads to a major accident.



Remote Communication
(universal Modbus communication)

- Media: RS485
- Address : 1~247
- Baud Rate : 9600, 19200, 38400bps
- PARITY : NONE, EVEN, ODD
- End switch
- Floating Point change (SWAP): USE, NOT USE

Setting group function

It is a function that composes optimal protection coordination with digital input depending on the situation such as system changes and facility maintenance by correcting multiple correction values on one protection relay element. Up to three groups can be specified.
* You can change setting Group in GIPAM1000 Menu.

Features

Self-diagnosis and sequence monitoring

The GIPAM1000 performs self-diagnosis by applying a redundant circuit to prevent the relay from malfunction due to a component or circuit fault and generates an alarm via communication or DO output in the event of a major fault.

- Error monitoring by measuring and comparing ADC IC abnormalities in two channels
- Error monitoring via internal board communication during relay boot
- Monitoring of SMPS power failures at all times
- Monitor for abnormalities with CPU, DSP Watchdog and perform H/W Reset in case of abnormalities
- Perform memory interval error checks, double back up to separate memory, and recover to backup data in case of failure

HMI with enhanced visibility and convenience

The GIPAM1000 is equipped with a 4.3" Color Graphic LCD and a Key button, which enhances visibility and convenience by providing an intuitive GUI, convenient MMI function, and various information screens.

- User convenience is enhanced by applying key buttons.
- Various measurement information is provided in various forms such as figures, graphs, and charts, so that intuitive information can be Obtained.

Event time calculation display (T-Ref)

When displaying various event records on the relay HMI, this function additionally displays the time interval between the first selected event and the other events. This is a convenient function that eliminates the need for manual calculation of how much time lag occurs when an important event occurs one after another.

Long-life and reliable parts applied

The reliability of the product has been further improved by applying polymer capacitors, super capacitors, and MRAM memory, which are longlife parts.

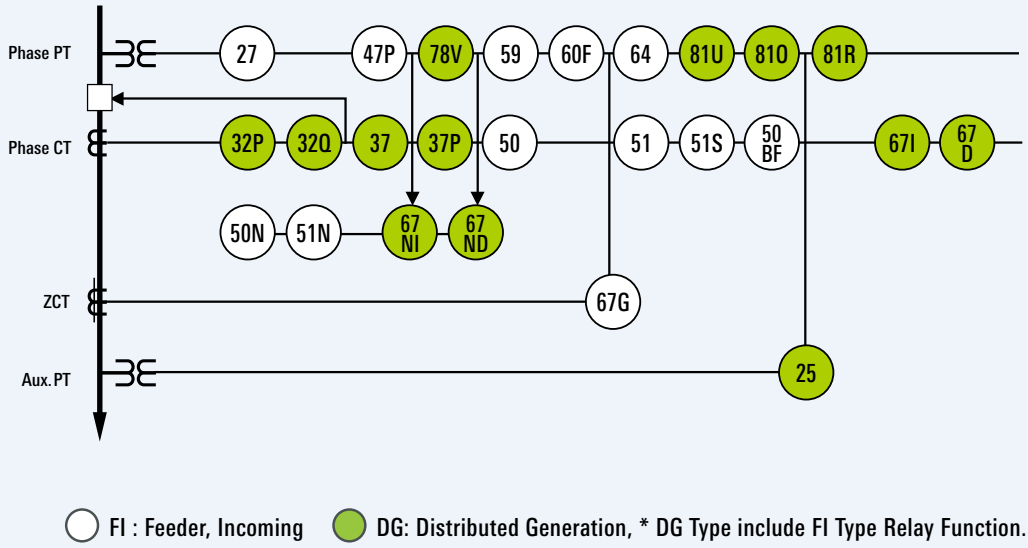
- Application of hybrid polymer capacitor: Minimize dry-up phenomenon of electrolytic capacitor applied to all electronic products.
- Super Capacitor application: For power backup of RTC operation in case of power failure, use Super Capacitor that can be used for a long time when charged instead of the primary battery.
- MRAM memory application : Among non-volatile memories used to store important relay settings, events and wave records, MRAM memory applied with the latest semiconductor technology is applied.
- Application of strong parts in high temperature and high humidity environment : Gold plated surface treatment and hole plug-in method are applied to prevent PCB surface corrosion.

Provide a wider range of use environments

Provides the use temperature (-25°C ~ 60°C) which is extended by more than 30% compared to the use temperature (-15°C ~ 55°C) of our other relays, and the storage temperature (-40°C ~70°C) which is expanded compared to the existing by providing also available in more severe environments.

Functional Block Diagram

GIPAM1000



○ FI : Feeder, Incoming ● DG: Distributed Generation, * DG Type include FI Type Relay Function.

Functions and Ratings

Protection

Type	Protection	Protection Function			
GIPAM1000 FI	Feeder	OCR (50/51) UVR (27) LOCK-OUT (86)	OCGR (50N/51N) OVR (59) CBF (50BF)	SGR (67G) OVGR (64) PTF (60F)	SEF (51S) POR (47P)
GIPAM1000 DG	Distributed Generation	OCR (50/51) UVR (27) LOCK-OUT (86) DOCGR(67NI/ND) UFR(81U) UCR(37)	OCGR (50N/51N) OVR (59) CBF (50BF) DPR(32P) OFR(81O) VVS(78V)	SGR (67G) OVGR (64) PTF (60F) DQR(32Q) ROCOF(81R)	SEF (51S) POR (47P) SYNC (25) DOCR(67I/67D) UPR(37P)

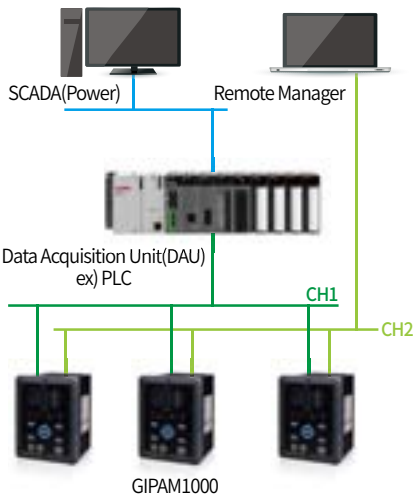
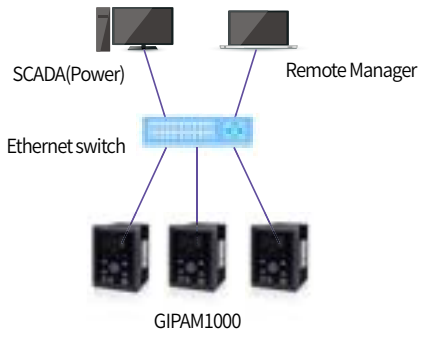
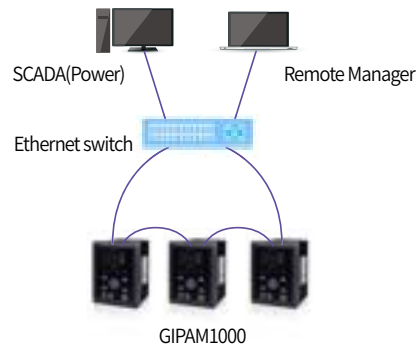
Note) 1. DOCGR is the same as DGR.
2. Lock-out (86) can be configured with Logic.

Measurement

Measurement		Display Range	Accuracy (%)	Remarks
Voltage	Voltage (V)	0.0V ~ 9999.999kV	±0.5	Phase Voltage, Line Voltage
	Normal/Negative (V_1/V_2)	0.0V ~ 9999.999kV	±5.0	
	Zero (V_{gpt})	0.0V ~ 9999.999V	±5.0	
	Bus (V_{aux})	0.0V ~ 9999.999kV	±5.0	
	Voltage unbalance rate (%)	0.0% ~ 300.00%	±5.0	
Current	Current (A)	0.0A ~ 999.999kA	±0.5	Phase Current (1A~6A)
	Normal/Negative (I_1 / I_2)	0.0A ~ 999.999kA	±5.0	
	Zero phase current (I_{nct})	0.0A ~ 999.999kA	±5.0	I_{nct}
	Zero phase current (I_{zct})	0.0A ~ 999.999A	±5.0	I_{zct}
Phase		-180.0°~180.0° (Phase Display Range)	±5°	
Power	Active Power	0.00 ~ 9999.999 MW	±1.0	+Forward, -Reverse (0.866 ≤ PF ≤ 1 , 1A ≤ Phase Current ≤ 6A)
	Reactive Power	0.00 ~ 9999.999 MVar	±1.0	+Forward, -Reverse (0 ≤ PF ≤ 0.5, 1A ≤ Phase Current ≤ 6A)
	Apparent Power	0.00 ~ 9999.999 MVA	±5.0	
Energy	Active Energy	0.00 ~ 99999.999 MWh	±1.0	+Forward, -Reverse (0.866 ≤ PF ≤ 1 , 1A ≤ Phase Current ≤ 6A)
	Reactive Energy	0.00 ~ 99999.999 MVarh	±1.0	+Forward, -Reverse (0 ≤PF ≤ 0.5, 1A ≤ Phase Current ≤ 6A)
	Apparent Energy	0.00 ~ 99999.999 MVah	±5.0	
Frequency	Frequency (V_a)	35 ~ 78Hz	±0.01Hz	Containing within 5% harmonics ±0.05Hz
	Frequency (V_{aux})	35 ~ 78Hz	±0.01Hz	Containing within 5% harmonics ±0.05Hz
Power factor	Power factor (PF)	-1.000 ~ 1.000	±0.02	Forward/Reverse (1A ≤Phase current ≤ 6A, 46V ≤Phase voltage ≤ 132V), Harmonic : 0%
	Fundamental Power factor (DPF)	-1.000 ~ 1.000	±0.02	Forward/Reverse (1A ≤Phase current ≤ 6A, 46V ≤Phase voltage ≤ 132V), Harmonic : 0%

Note) Active power accuracy is when PF=1.

Communication

Type	RS-485	Ethernet
Protocol	DNP3.0 SERIAL MODBUS-RTU	DNP3.0 TCP MODBUS-TCP IEC61850 Ed.1/Ed.2
Specification	• Distance : Max. 1.2km • Speed : 9600, 19200, 38400bps • Cable : RS485 standard cable, 22AWG twisted shield pair cable •Mode : Differential • Method : Half-Duplex • Max input/output voltage : -7V ~ +12V	[10/100Base-TX] • Distance : Max. 100m per segment • Speed : Max 100Mbps • Cable : UTP(CAT.5), STP(Level 3) • Topology : Star type, Ring type
Wiring	• Comm. terminal - CH 1 (8th terminal) : SCADA only - CH 2 (9th terminal) : Manager only, the REMOTE MANAGER setting should be set to 'USE' 	• Comm.terminal :Don't care if the IP address is correct, communication is possible **<Star type>**  **<Ring type>**  * When using RSTP (Rapid STP), a maximum of 30 nodes in one ring is recommended.

Functions and Ratings

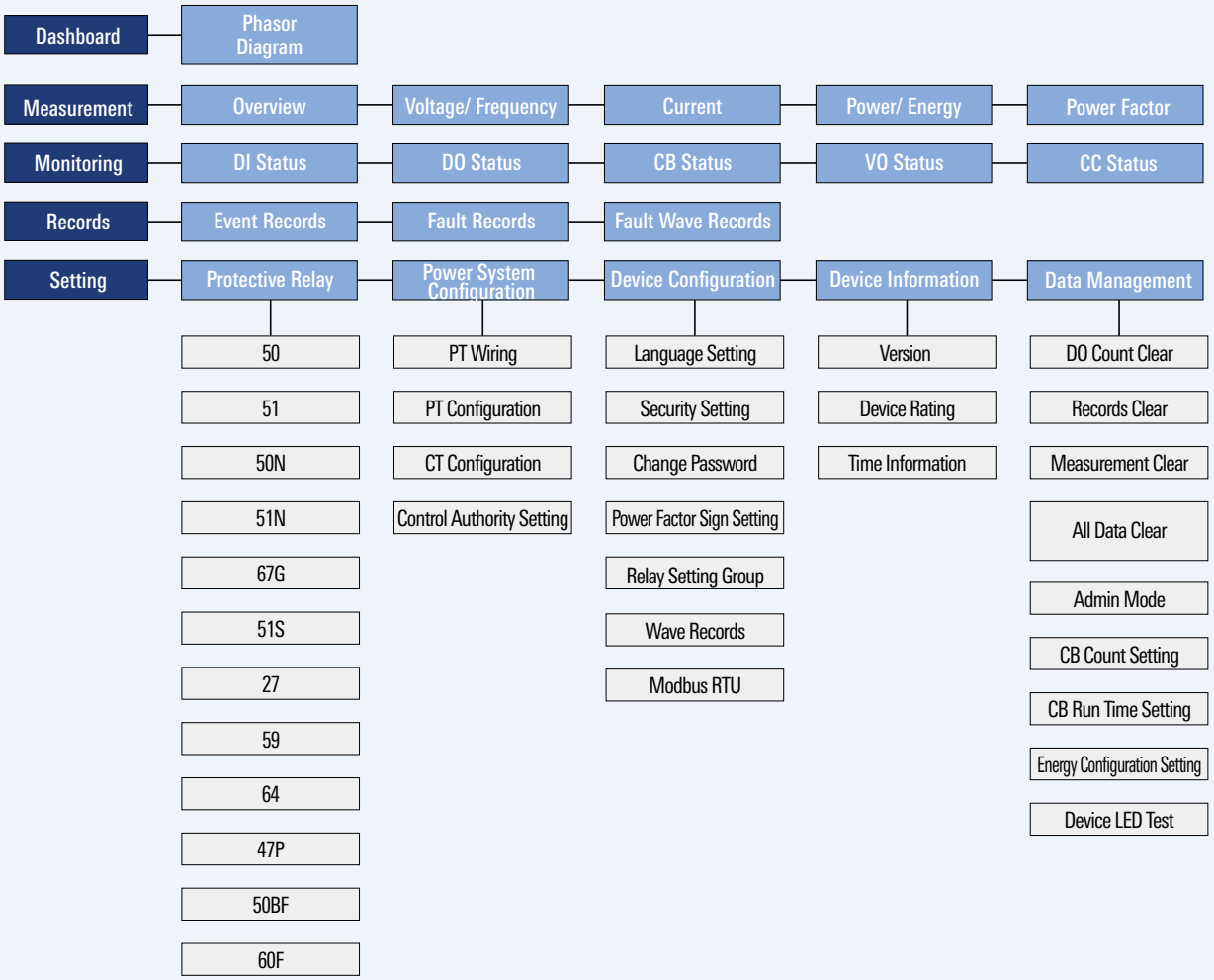
Rating

Type			Specification
Wiring			3P3W(2PT-D), 3P4W(3PT-Y)
Rating	Frequancy		60Hz, 50Hz
	Voltage	PT	110V (55~125V)
		GPT	Vn*√3 (Vn= PT Secondary rating voltage)
	Current	CT	5A
		ZCT	1.5mA
	Power		AC/DC110V, DC125V
	Power consumption		30W or less : Stanby / 50W or less : Operation
	Burden		0.5VA or less : PT 1.0VA or less : CT
Input contact	For general		Digital Input AC/DC 110V, DC125V
Output contact	TRIP		AC 250V 10A/DC 30V 10A, Resistive Load : Rated Capacity AC 2500VA, DC 300W : Opening Capacity
	ALARM		AC 250V 5A/DC 30V 5A, Resistive Load : Closed Capacity AC 1250VA, DC 150W : Opening Capacity
Tolerance	Operation Value		±5%
	Operation Time		±5% or ±35ms
Insulation Resistance			DC 500V 100MΩ or more
Insulation Voltage			AC 2kV(1kV)/1min
Impulse Voltage			AC 5kV(3kV) or more, 1.2x50μs standard waveform supplied
Overload withsatand	Current circuit		Withstand 1.2 times of rated current continuously Withstand 2 times of rated current for 3 hours. Withstand 20 times of rated current for 2 seconds. Withstand 40 times of rated current for 1 second.
	Voltage circuit		Withstand 1.15 times of rated voltage for 3 hours.
Fast Transient Disturbance			Power Input 4kV Other Input 2kV
ESD (Electrostatic Discharge)			8kV : Air, 6kV : Contact
Temperature	Operation		-25°C ~ 60°C
	Storage		-40°C ~ 70°C
Humidity			RH 80% or less (non-condensing)
Altitude			2,000m or less
Environment			A place not subject to abnormal vibration and shock.
Applied Standards			KEMC 1120
Dimension			194.4(W) × 254(H) × 218.4(D)
Weight			6.78kg
Communication			RS-485 : Modbus

No	Name	Function
1	TFT LCD	Display
2	Status LED	・Power (Green) : Turn On when Power is on. ・Comm. (Orange) : Blinking During Remote communication ・DIAG/ERR (Yellow) : Blinking or Turn On During Device Failure ・PICK-UP/TRIP (Red) : Blinking During Relay Pickup , Turn on During Relay Trip
3	TRIP LED	・Relay Pickup status : Blinking Relay Trip Status : Turn on
4	Setting , Other Button	・SETTING : Go to Settings Menu, change settings and save button ・RESET KEY: Relay Status Reset Button ・R/L : Change control button (Remote - Green, Local - Red) ・∧, ∨, <, > and ENTER : Cursor movement and ENTER Button ・CANCEL : Change settings CANCEL Button
5	CB control and USB	・CB CLOSE/OPEN : Breaker No. 1 ON or OFF OPERATION BUTTON ・(CLOSE: red, OPEN: green) ・USB: USB Port for IED Manager

Operation and Setting

GIPAM1000 FI



GIPAM1000 DG

Operation characteristics

Relay(Common)

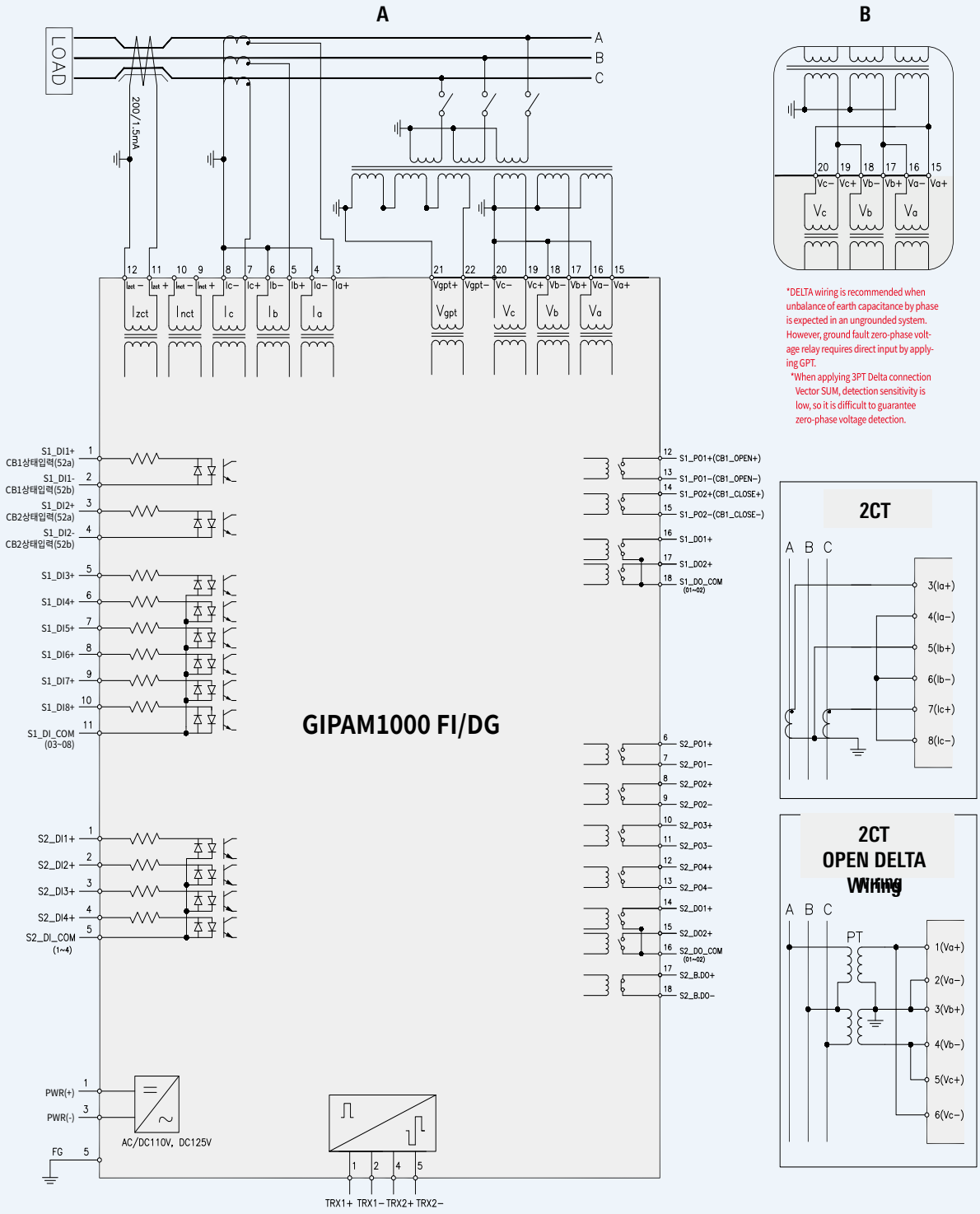
Protection Element	Operating Characteristic	Setting Range / Step , Op. time	Remarks
OCR Inst (50)	Inst. Definite	Setting : OFF, 5 ~ 150 A / 0.1A Op. time : 0, 0.05 ~ 60.00 s / 0.01 s (Inst., Definite)	When set to "0"Operating at 40ms or less
OCR TD (51)	Definite Inverse	Setting : OFF, 0.5 ~ 20.00A / 0.01 A Op. time : 0.05 ~ 60.0 s / 0.01 s (Definite) Delay time : 0 ~ 10.0 s / 0.01 s (Inverse) Inverse TMS : 0.05 ~ 15.00 / 0.01 (IEEE) 0.05 ~ 1.20 / 0.01 (IEC / KEPCO)	Inverse Curve IEEE EI / VI / MI IEC VI / EI / SI / LI KEPCO SI / VI
OCGR Inst (50N)	Inst. Definite	Setting : OFF, 0.5 ~ 40.0 A / 0.1A Op. time : 0, 0.05 ~ 60.00 s / 0.01 s (Inst., Definite) Motor Start Block : USE, NOT USE Motor Block time : 1 ~ 60 s / 1.0 s	When set to "0"Operating at 40ms or less Motor Block I > 1A
OCGR TD (51N)	Definite Inverse	Setting : OFF, 0.10 ~ 10.00 / 0.01 A Op. time : 0.05 ~ 60.00 s / 0.01 s (Definite) Inverse TMS : 0.05 ~ 15.00 / 0.01 (IEEE) 0.05 ~ 1.20 / 0.01 (IEC / KEPCO) Motor Start Block : USE, NOT USE Motor Block time : 1 ~ 60 s / 1.0 s	Inverse Curve IEEE EI / VI / MI IEC VI / EI / SI / LI KEPCO SI / VI Motor Block I > 1A
SGR (67G)	Definite	Zero Current Setting: 1.0 ~ 20.0 mA / 0.1mA Zero Voltage Setting: 8 ~ 80 V / 1 V Dir. Angle : 0 ~ 359 ° / 1 ° Op. time: 0.05 ~ 60.0 s / 0.01 s	Op. Angle : ±87° (Fixed)
SEF (51S)	Definite	Zero Current Setting: 1.0 ~ 20.0 mA / 0.1mA Op. time: 0.05 ~ 60.00 s / 0.01 s	
UVR (27)	Definite	Setting: OFF, 10.0 ~ 110.0 V / 0.1 V Op. time: 0.05 ~ 60.00 s / 0.01 s Auto Reset: USE, NOT USE Dead Voltage Block: USE, NOT USE No display: USE, NOT USE Mode: SINGLE PHASE PLC Output Mode : PLC/PO_03	Dead Voltage Block : Below 6 volts,UVR does not work.
OVR (59)	Definite	Setting: OFF, 40.0 ~ 180.0 V / 0.1 V Time Delay: 0.05 ~ 60.00 s / 0.01 s	
OVGR (64)	Definite	Setting: OFF, 5.0 ~ 80.0 V / 0.1 V Time Delay: 0.05 ~ 60.00 s / 0.01 s PLC Output Mode : PLC/PO_06	
POR (47P)	Definite	Setting : OFF, 5 ~ 100 % / 1 % Op. time : 0.05 ~ 60.00 s / 0.01 s Vub(Unbalance Ratio) Cal. Method Setting : NEMA, XGIPAM, G2K	NEMA : Vub = Max(|Vline-Vavg|)/Vavg *100% XGIPAM : Vub = Max(|Vphase-Vavg|)/Vavg *100% G2K : Vub = (Vmax – Vmin)/Vavg *100%
CBF (50BF)	Definite	Setting: OFF, 1.0 ~ 5.0 A / 0.5 A Op. time: 0.1 ~ 1.00 s / 0.01s	
PTF (60F)	-	V(min) : 10 ~70 V / 1 V Iub : 20 % (Fixed) I(min) : 0.1 A (Fixed) I(max): 5.0 A (Fixed) Op. time : 0.04 s (Fixed) Iub Cal. Method : NEMA Method	Op. Condition : CB1 Close status & 3-phase minimum current of 0.1 A or more & 3-phase maximum current of 5.0 A or less & current imbalance below 20% voltage setting

Relay(Only for DG)

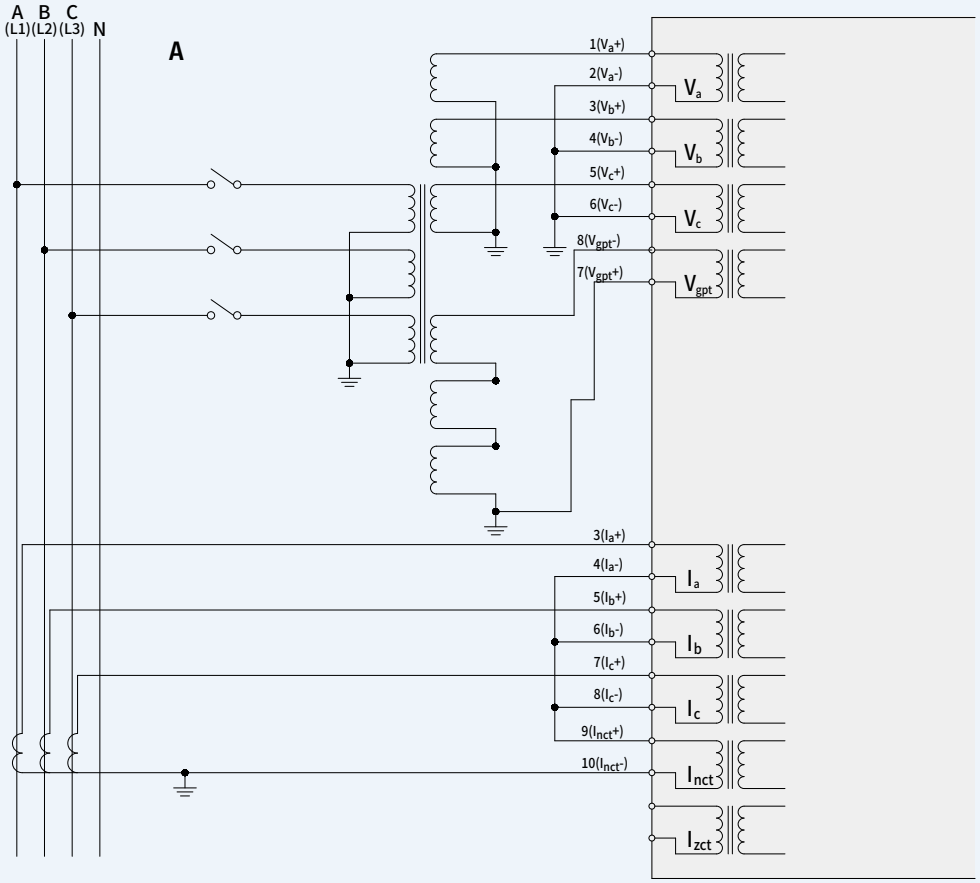
Protection Element	Operating Characteristic	Setting Range / Step , Op. time	Remarks
SYNC (25)	Definite	Voltage Difference : OFF, 2 ~ 50 V / 1 V Phase Difference : OFF, 5 ~ 45 ° / 1 ° Frequency Difference : OFF, 0.01 ~ 0.50 Hz / 0.01 Hz Syn. Permission Voltage Setting치: 40 ~ 132 V (Fixed) Dead Voltage USE : USE, NOT USE Dead Voltage : 10 ~ 30 V / 1 V	
DOCGR (67NI)	Inst. Definite	Zero Current Setting: 0.5 ~ 40.0 A / 0.1A Zero Voltage Setting: 10 V (Fixed) Dir. Angle: 0 ~ 359 ° / 1 ° Op. Time: 0, 0.05 ~ 60 s / 0.01 s (Inst., Definite)	When set to "0"Operating at 50ms or less Op. Angle : ±87 ° (Fixed)
DOCGR (67ND)	Definite Inverse	Zero Current Setting: 0.1 ~ 10.0 A / 0.01 A Zero Voltage Setting: 10 V (Fixed) Dir. Angle: 0 ~ 359 ° / 1 ° Inverse TMS: 0.05 ~ 15.00 / 0.01 (IEEE) 0.05 ~ 1.20 / 0.01 (IEC / KEPCO)	Inverse Curve IEEE EI / VI / MI IEC VI / EI / SI / LI KEPCO SI / VI Operating range angle:: ±87 ° (Fixed)
DPR (32P)	Definite	Setting: OFF, 15 ~ 2,475 W / 0.1W Power Flow Direction: FORWARD, REVERSE Op. Time: 0.10 ~ 60.00 s / 0.01 s	
DQR (32Q)	Definite	Setting: OFF, 11 ~ 500 VAr / 0.1VAR Power Flow Direction: FORWARD, REVERSE Op. Time: 0.10 ~ 60.00 s / 0.01 s	Q Cal. Formular : Qa=Ia*(Vb-Vc) *Logic : Direct Connection Between each Phase UVR and each Phase DQR.
DOCR Inst (67I)	Inst. Definite	Setting: OFF, 5 ~ 150 A / 0.1 A Dir. Angle: 0 ~ 359 ° / 1 ° Op. Time: 0, 0.05 ~ 60.00 s / 0.01 s	When set to "0"Operating at 50ms or less Op. Angle : ±87 ° (Fixed)
DOCR TD (67D)	Definite Inverse	Setting: OFF, 0.5 ~ 20.00A / 0.01 A Dir. Angle: 0 ~ 359 ° / 1 ° Inverse TMS: 0.05 ~ 15.00 / 0.01 (IEEE) 0.05 ~ 1.20 / 0.01 (IEC / KEPCO)	Inverse Curve IEEE EI / VI / MI IEC VI / EI / SI / LI KEPCO SI / VI Op. Angle : ±87 ° (Fixed)
UFR (81U)	Definite	60Hz Setting: OFF, 50 ~ 60 Hz / 0.01 Hz 50Hz Setting: OFF, 40 ~ 50 Hz / 0.01 Hz Op. Time: 0.10 ~ 60.00 s / 0.01 s	PT#1 Fixed Under Voltage Block : 40 V (Fixed)
OFR (81O)	Definite	60Hz Setting: OFF, 60 ~ 70 Hz / 0.01 Hz 50Hz Setting: OFF, 50 ~ 60 Hz / 0.01 Hz Op. Time: 0.10 ~ 60.00 s / 0.01 s	PT#1 Fixed Under Voltage Block : 40 V (Fixed)
ROCOF (81R)	Definite	Setting: OFF, 0.1 ~ 2 .0 Hz/s / 0.01 Hz/s Op. Time: 0.20 ~ 1.00 / 0.01s	PT#1 Fixed Under Voltage Block : 40 V (Fixed)
UPR (37P)	Definite	Setting: OFF, 15 ~ 500W / 1W Power Flow Direction: FORWARD, REVERSE Op. Time: 0.1 ~ 60.00 / 0.01s	P3Φ Fixed Dead Power Block : 15VA (Fixed, 5A Rating)
UCR (37)	Definite	Setting: OFF, 0.50 ~ 4.50A / 0.10A Op. Time: 0.1 ~ 60.00 / 0.01s	CT#1, CT#2, CT#3 Fixed Dead Current Block : 0.1A (Fixed)
VVS (78V)	Inst.	Setting: OFF, 2 ~ 30 ° / 1 ° Under Voltage Block : 40~90V	PT#1, PT#2, PT#3 Fixed

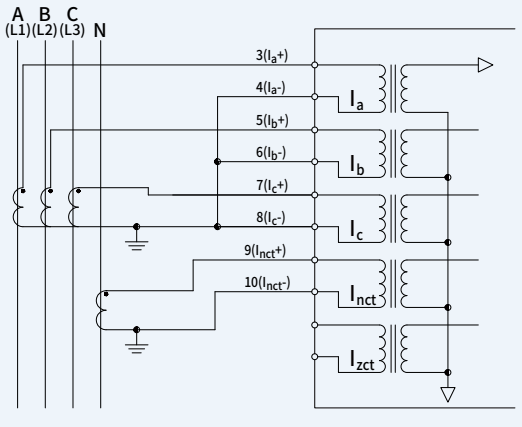
GIPAM1000 FI/DG Wiring

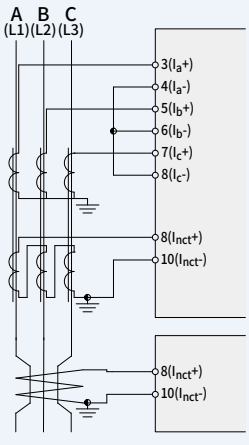
3P3W



3P4W





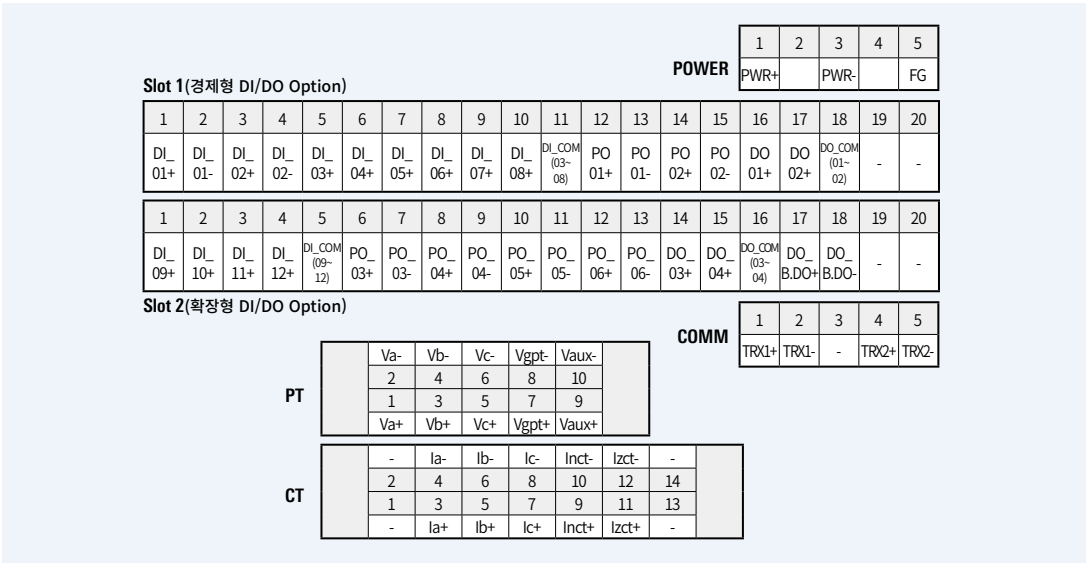


* In case of using three-winding CT as 3CT-Y connection in a three-phase three-wire resistance ground system

* In case of using ground CT in a three-phase three-wire resistance ground system

Contact Configuration

Terminal



I/O Contact Configuration (FI Type)

Slot No.	Contact Name	Number	Default Usage(Default PLC) DIDO Module : D2	Change Usage	Default CC/VO		Remark
					CC No.	VO No.	
Slot1	DI_01	1(2)	CB1 Status Input (52a)	Cannot be Changed			CB Close Status
	DI_02	3(4)	CB1 Status Input (52b)	Cannot be Changed			CB Open Status
	DI_03	5(11)	General DI	General DI			
	DI_04	6(11)	General DI	General DI			
	DI_05	7(11)	General DI	General DI			
	DI_06	8(11)	General DI	General DI			Setting Group
	DI_07	9(11)	General DI	General DI			
	DI_08	10(11)	General DI	General DI			Control Authority Digital Input
	PO_01	12(13)	CB1 OPEN Output	Cannot be Changed			
	PO_02	14(15)	CB1 CLOSE Output	Cannot be Changed			
	DO_01	16(18)	OCR(50), OCR(51)	General DO	CC01	VO10	
	DO_02	17(18)	OCGR(50N), OCGR(51N), SGR(67G), SEF(51S)	General DO	CC02	VO11	
Slot2	DI_09	1(5)	General DI	General DI			
	DI_10	2(5)	General DI	General DI			
	DI_11	3(5)	General DI	General DI			
	DI_12	4(5)	General DI	General DI			
	PO_03	6(7)	UVR(27)	General DO	CC03	VO12	UVR Output
	PO_04	8(9)	OVR(59)	General DO	CC04	VO13	
	PO_05	10(11)	POR(47P)	General DO	CC05	VO14	
	PO_06	12(13)	OVGR(64)	General DO	CC06	VO15	OVGR Output
	DO_03	14(16)	86X DO	General DO	CC07	VO16	
	DO_04	15(16)	BUZZER DO	General DO	CC08	VO17	
	DO_B.BO	17(18)	POWER FAIL, Diagnostics Output(Fixed)	DO	-	-	

Slot No.	Contact Name	Number	Default Usage(Default PLC) DIDO Module : D1	Change Usage	Default CC/VO		Remark
					CC No.	VO No.	
Slot1	DI_01	1(2)	CB1 Status Input (52a)	Cannot be Changed			CB Close Status
	DI_02	3(4)	CB1 Status Input (52b)	Cannot be Changed			CB Open Status
	DI_03	5(11)	General DI	General DI			
	DI_04	6(11)	General DI	General DI			
	DI_05	7(11)	General DI	General DI			
	DI_06	8(11)	General DI	General DI			Setting Group
	DI_07	9(11)	General DI	General DI			
	DI_08	10(11)	General DI	General DI			Control Authority Digital Input
	PO_01	12(13)	CB1 OPEN Output	Cannot be Changed			
	PO_02	14(15)	CB1 CLOSE Output	Cannot be Changed			
	DO_01	16(18)	OCR(50), OCR(51), OCGR(50N), OCGR(51N),SGR(67G), SEF(51S)	General DO	CC01	VO10	
	DO_02	17(18)	UVR(27), OVR(59), POR(47P), OVGR(64)	General DO	CC02	VO11	

Note)1. Default values of 27 and 64 relay elements are used as Trip and Alarm, respectively.
You can modify the contents through product manipulation and Manager programs.
2. In case of D1 product, 27, 64 cannot be set using product operation and Manager, PLC modification is required for this
3. CC: Switch for testing relay output contact operation of the device without a Source Input.

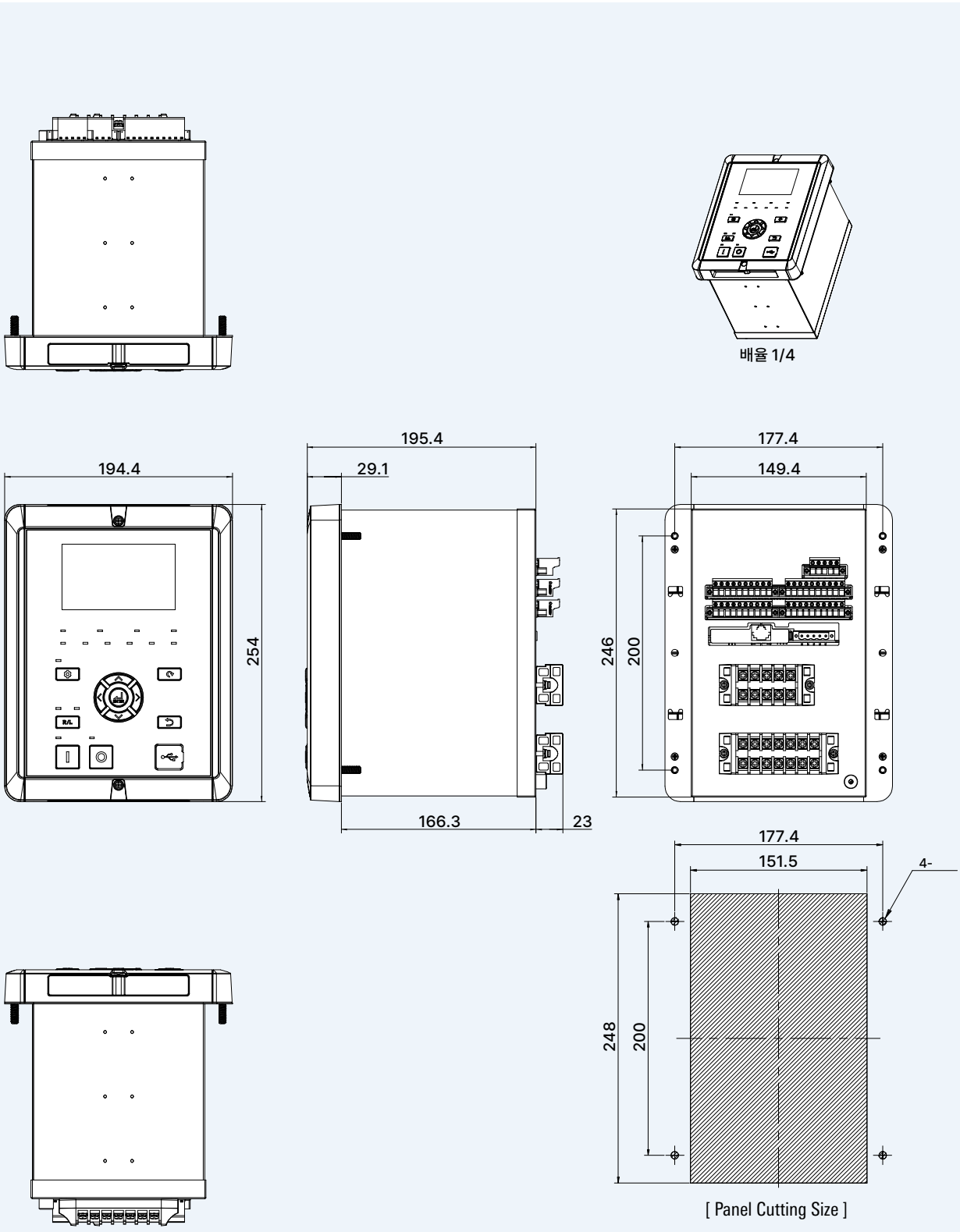
I/O Contact Configuration (DG Type)

Slot No.	Contact Name	Number	Default Usage(Default PLC) DIDO Module : D2	Change Usage	Default CC/VO		Remark
					CC No.	VO No.	
Slot1	DI_01	1(2)	CB1 Status Input (52a)	Cannot be Changed			CB Close Status
	DI_02	3(4)	CB1 Status Input (52b)	Cannot be Changed			CB Open Status
	DI_03	5(11)	General DI	General DI			
	DI_04	6(11)	General DI	General DI			
	DI_05	7(11)	General DI	General DI			
	DI_06	8(11)	General DI	General DI			Setting Group
	DI_07	9(11)	General DI	General DI			
	DI_08	10(11)	General DI	General DI			Control Authority Digital Input
	PO_01	12(13)	CB1 OPEN Output	Cannot be Changed			
	PO_02	14(15)	CB1 CLOSE Output	Cannot be Changed			
	DO_01	16(18)	50/51, 67I, 67D, 37	General DO	CC01	VO10	
	DO_02	17(18)	50/51N, 67G, 51S,67NI, 67ND	General DO	CC02	VO11	
Slot2	DI_09	1(5)	General DI	General DI			
	DI_10	2(5)	General DI	General DI			
	DI_11	3(5)	General DI	General DI			
	DI_12	4(5)	General DI	General DI			
	PO_03	6(7)	27	General DO	CC03	VO12	UVR Output
	PO_04	8(9)	59, 47P	General DO	CC04	VO13	
	PO_05	10(11)	81O, 81U, 81R, 78V, 25	General DO	CC05	VO14	
	PO_06	12(13)	64	General DO	CC06	VO15	OVGR Output
	DO_03	14(16)	32Q, 37P	General DO	CC07	VO16	
	DO_04	15(16)	32P	General DO	CC08	VO17	
	DO_B.BO	17(18)	POWER FAIL, Diagnostics Output(Fixed)	DO	-	-	

Slot No.	Contact Name	Number	Default Usage(Default PLC) DIDO Module : D1	Change Usage	Default CC/VO		Remark
					CC No.	VO No.	
Slot1	DI_01	1(2)	CB1 Status Input (52a)	Cannot be Changed			CB Close Status
	DI_02	3(4)	CB1 Status Input (52b)	Cannot be Changed			CB Open Status
	DI_03	5(11)	General DI	General DI			
	DI_04	6(11)	General DI	General DI			
	DI_05	7(11)	General DI	General DI			
	DI_06	8(11)	General DI	General DI			Setting Group
	DI_07	9(11)	General DI	General DI			
	DI_08	10(11)	General DI	General DI			Control Authority Digital Input
	PO_01	12(13)	CB1 OPEN Output	Cannot be Changed			
	PO_02	14(15)	CB1 CLOSE Output	Cannot be Changed			
	DO_01	16(18)	"50/51, 67I, 67D, 37, 50/51N, 67G, 51S,67NI, 67ND, 27, 59, 47P, 81O, 81U, 81R, 78V, 64, 32Q, 37P"	General DO	CC01	VO10	
	DO_02	17(18)	25, 32P	General DO	CC02	VO11	

Note)1. Default values of 27 and 64 relay elements are used as Trip and Alarm, respectively.
You can modify the contents through product manipulation and Manager programs.
2. In case of D1 product, 27, 64 cannot be set using product operation and Manager, PLC modification is required for this
3. CC: Switch for testing relay output contact operation of the device without a Source Input.
4. When operating 32P CB does not operate. Please correct the LOGIC if necessary.

Dimension



GIPAM1000 FI/DG

GIPAM1000	F	RS	M	D2	5A	60Hz	AC/DC110V, DC125V	DI_AC/DC110V, DC125V

Protection	
FI	Feeder, Incoming
DG	Distributed Generation

Protocol		
M	MODBUS	
D	DNP	Note1)
C	IEC61850	Note2)

CT Ratio
5A

Frequency
50Hz
60Hz

Control Power
AC/DC110V,DC125V

Communication Method	
RS	RS-485
TE	100/10 BASE-T Ethernet

Note3)	DI/DO Module
D2	FULL DI/DO
D1	Compact DI/DO

DI Input Power
AC/DC110V, DC125V

Note1, 2) Contact sales separately when ordering
Note3) D2: Consists of 12 DI, 6 PO, 4 DO, 1 DO (self-diagnosis)
D1: Consists of 8 DI, 2 PO, 2 DO

GIPAM1000 - IED Manager

Note) You can download IED Manager Software from the homepage and purchase and use a universal USB A to B cable.

Certificate

UCA International Users Group

ktl

IEC 61850 Certificate Level A[1]

No. 23-061510-01-1

Issued to:
LS ELECTRIC Co., Ltd.
127, LS-ro, Dongan-gu, Anyang-si,
Gyeonggi-do, Republic of Korea

For the server product:
Multifunctional Protection Relay
GIPAM1000
Software Version : 01.00.00
OS : Nucleus RTOS
S/N : 231110-1601.0003

Issued by: **Korea Testing Laboratory**

The server product has not been shown to be non-conforming to:
IEC 61850 Edition 2 Parts 6, 7-1, 7-2, 7-3, 7-4 and 8-1
Communication networks and systems for power utility automation

The conformance test has been performed according to IEC 61850-10 Edition 2, the UCA International Users Group Edition 2 Server Test Procedures version 2.0.6 with product's protocol, model and technical issue implementation conformance statements: "LS Electric_GIPAM1000_PICS_v.1", "LS Electric_GIPAM1000_MICS_v.1", "LS Electric_GIPAM1000_TICS_v.1" and the extra information for testing: "LS Electric_GIPAM1000_PIXIT_v.1".

The following IEC 61850 conformance blocks have been tested with a positive result (number of relevant and executed test cases / total number of test):

1	Basic Exchange (24/26)	9b	GOOSE Subscribe (19/20)
2	Data Sets (4/7)	12a	Direct Control (10/19)
2+	Data Set Definition (24/24)	12b	SBO Control (17/26)
4	Setting Group Selection (4/4)	12c	Enhanced Direct Control (12/21)
5	Unbuffered Reporting (23/23)	12d	Enhanced SBO Control (18/29)
6	Buffered Reporting (33/33)	13	Time Sync (4/7)
9a	GOOSE Publish (12/13)	14	File Transfer (5/8)

This Certificate includes a summary of the test results as carried out at Korea Testing Laboratory in Republic of Korea with IEC 61850 Ed2 KTL Testing Tool 1.0 with test suite IEC 61850 Ed2 Server Conformance Test V.1.0 and IEC 61850 Ed2 KTL Trace Manager V.1.0. This document has been issued for information purposes only, and the original paper copy of the KTL report: No. TR-23-061510-01-1 will prevail.

The test has been carried out on one single specimen of the product as referred above and submitted to KTL by LS ELECTRIC Co.,Ltd.. The manufacturer's production process has not been assessed. This certificate does not imply that KTL has certified or approved any product other than the specimen tested.

Seoul, November 13, 2023

A. Han

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Principal Engineer
IT Convergence Technology Center

YoungKwang Yun
Assistant Research Engineer
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1 Level A - Independent Test lab with accredited ISO/IEC 17025 Quality System

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UCA International Users Group
P.O. Box 315, Shell Knob
MO 65747 USA

Applicable Test Procedures from the UCA International Users Group Server Device Test Procedures version 2.0.6

Conformance Block	Mandatory	Conditional
1: Basic Exchange	sAss1, sAss2, sAss3, sAss4, sAssN2, sAssN3, sAssN4, sAssN5, sSrv1, sSrv2, sSrv3, sSrv4, sSrv5, sSrv8, sSrvN1abcdf, sSrvN4	sAssN6, sSrv6, sSrv9, sSrv10, sSrv12, sSrvN1e, sSrvN2, sSrvN3
2: Data Sets	sDs1, sDs10a, sDsN1ae	sDs15
2+: Data Set Definition	sDs2, sDs3, sDs4, sDs5, sDs6, sDs7, sDs8, sDs9, sDs13, sDs14, sDsN1cd, sDsN2, sDsN3, sDsN4, sDsN5, sDsN6, sDsN7, sDsN8, sDsN9, sDsN10	sDs11, sDs12, sDsN11, sDsN12
4: Setting Group Selection	sSg1, sSg3, sSgN1	sSg11
5: Unbuffered Reporting	sRp1, sRp2, sRp3, sRp4, sRp5, sRp9, sRp14, sRp16, sRpN1, sRpN2, sRpN3, sRpN4, sRpN8	sRp6, sRp7, sRp8, sRp10, sRp11, sRp12, sRp13, sRp15, sRp17, sRpN5
6: Buffered Reporting	sBr1, sBr2, sBr3, sBr4, sBr5, sBr9, sBr14, sBr16, sBr20, sBr21, sBr22, sBr25, sBr26, sBr27, sBr28, sBr29, sBrN1, sBrN2, sBrN3, sBrN4, sBrN5, sBrN8	sBr6, sBr7, sBr8, sBr10, sBr11, sBr12, sBr13, sBr15, sBr17, sBr23, sBr24
9a: GOOSE Publish	sGop2a, sGop3, sGop4, sGop9, sGop10, sGop11, sGop12	sGop1, sGop2b, sGop6, sGopN1, sGopN2
9b: GOOSE Subscribe	sGos1, sGos2, sGos3, sGos5, sGos6a, sGos7, sGos8, sGos9, sGos10, sGos11, sGos12, sGos23, sGosN1, sGosN2, sGosN3, sGosN4, sGosN5, sGosN6	sGos13
12a: Direct Control	sCtl5a, sCtl10a, sDOns1, sDOns2	sCtl2a, sCtl7a, sCtl13a, sCtl15a, sCtl16a, sCtl28a
12b: SBO Control	sCtl5b, sCtl8b, sCtl9b, sCtl10b, sCtl11b, sCtl25b, sSBOns1, sSBOns2, sSBOns6	sCtl2b, sCtl4b, sCtl6b, sCtl7b, sCtl15b, sCtl16b, sCtl27b, sCtl28b
12c: Enhanced Direct Control	sCtl5c, sCtl10c, sDOes1, sDOes2	sCtl2c, sCtl7c, sCtl13c, sCtl14c, sCtl15c, sCtl16c, sCtl26c, sCtl28c
12d: Enhanced SBO Control	sCtl5d, sCtl8d, sCtl9d, sCtl10d, sCtl11d, sCtl25d, sSBOes1, sSBOes2, sSBOes6, sSBOes8	sCtl2d, sCtl4d, sCtl6d, sCtl7d, sCtl15d, sCtl16d, sCtl26d, sCtl28d
13: Time Sync	sTm1, sTm2, sTmN1	sTmN2
14: File Transfer	sFt1, sFt2ab, sFt4, sFt5, sFtN1ab	

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