User's Guide - Multi-GEM 18

For the more information of Multi-GEM 18, please refer full version manual (soft copy) that you can get via e-mail and homepage.

1. Introduction

Multi-GEM installed in electric distribution and local panels enables the facility managing to meter and monitor electric power of their production line and facility equipment in detail analyze and diagnose the power consumption patterns. It makes for engineers to improve their facility process and energy saving. All the information of electric power transmit to the Host via Ethernet or serial communication. Multi-GEM support 18 channels and up to 8 feeders for a 3phase circuit or 18 feeders for a single phase or any combination of single and three phase circuits with Multi-GEM_18. This useful flexibility makes Multi-GEM to take effective logging and monitoring system of multi-power using factories, IDCs (internet Data Center), Office buildings and shopping malls. Analysis power and load control in different circuits and area for illumination, HVAC, chillers, refrigeration system will make an actual energy saving. It makes better understanding for users to monitor the actual electricity consumption versus a target in a certain period. Users are able to find out which sub-system would go wrong and to react consequently. Users can also optimize their energy consumption when actual consumption exceeds the target.

2. Characteristics

- ■ Multiple Power Meter (Multi-GEM) is able to measure and monitor multi electric power loads.
- ■ Max 18 single phase or 8 3P3W or 6 3P4W feeders power monitoring
- ■ Measurement : Phase voltage , Line voltage & current, Frequency, Power Factor, Unbalance, Active/ Reactive/Apparent Power, Active/Reactive/Apparent Energy.
- ■ 1.0/0.5 Class accuracy for power measurement conformed by IEC62053-21/IEC62053-22.
- ■ Flexible application for the single phase/ 3phase 4wire/ 3phase 3wire power line.
- ■ Cost saving by power monitoring.
- ■ Sag/Swell detection.
- ■ Total Harmonics Distortion (THD)
- ■ 1 analog input terminal for temperature measurement (NTC)
- ■ Support RS485 Serial (Modbus RTU) and Ethernet (Modbus TCP) Comm

3. Specification

Model		iSAST Multi-GEM18
Power system		1P2W, 3P3W(2CT), 3P4W
Inputs Rating	Measurement	50-690 V~ 3~ L-L, Max. 6000 A, 3~, CAT Ⅲ
	Frequency	50 /60 Hz
	CT port	100mA or 333mV (depends on ref.)
	Control power Power	AC100-240V~/ DC140-330V, 50/60Hz, 0.12~0.07A
	Consumption	5W max
	Digital Input	1point, AC 220V external input power
	NTC	25℃,10kΩ,(β(25/85)=3970˚k
Output Contact		1-SPST, AC 250V 5A, DC 30V 5A
Communication		Modbus RS485 Modbus TCP
Usage		Indoor use
altitude up to		2 000 m
Operating Temperature		- 10 ˚C to 55 ˚C
Storage Temperature		-25˚C to 70˚C
Humidity		Maximum relative humidity 80 % for temperatures up
Over voltage category		to 31 ˚C decreasing linearly to 50 % relative humidity
Pollution degree		at 40 ˚C

Model	iSAST Multi-GEM18
Short-term temporary	overvoltage: 1440V for AC Mains
Long-term temporary	overvoltage: 490V for AC mains
Standards	IEC 62053-21/22

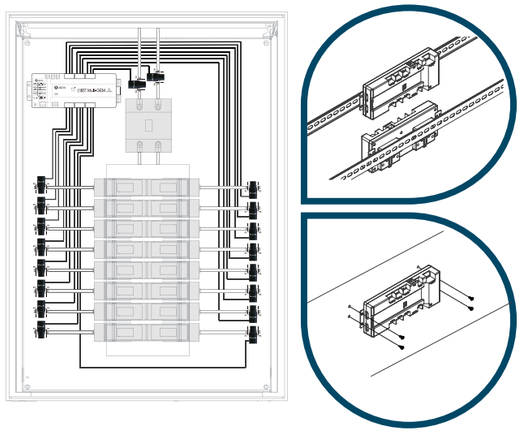
Measurement

Item	Display		Accuracy
	Unit	Digit	
Phase voltage	V	0.00 ~ 9,999,999.99	Max 400V for low voltage
Line voltage	V	0.00 ~ 9,999,999.99	Max 690V for low voltage
Line current	A	0.00 ~ 9,999,999.99	
Active power	W	±0 ~ 999,999,999	
Reactive power	Var	±0 ~ 999,999,999	
Apparent power	VA	0 ~ 999,999,999	
Frequency	Hz	45.00 ~ 65.00	
Power Factor	%	± 100.00	
Temp. (NTC)	℃	-20.0 ~ 100.00	
Voltage unbalance	%	0.0 ~ 100.00	
Current unbalance	%	0.0 ~ 100.00	
Phase angle	°	0.0 ~ 360.00	Between voltage and current
THD	%	0.0 ~ 100.00	Total Harmonics Distortion (Harmonics reactive power)
Active Energy	kWh	0.0 ~ 99,999,999.9	
Reactive Energy	kVarh	0.0 ~ 99,999,999.9	
Apparent Energy	kVAh	0.0 ~ 99,999,999.9	

4. Installation

1. Installation Conditions
It needs to avoid a place where direct interference exists like as high temperature and electromagnetic field for the installation. Please check the environment conditions around Multi-GEM below for a correct operation.

Item	Condition
Location	Indoor
Operation temp,	-10℃ ~ 55℃ [14℉ ~ 131℉]
Storage temp,	-25℃ ~ 70℃ [-13℉ ~ 158℉]
Operation humidity	Non condensation, 5% ~ 95%



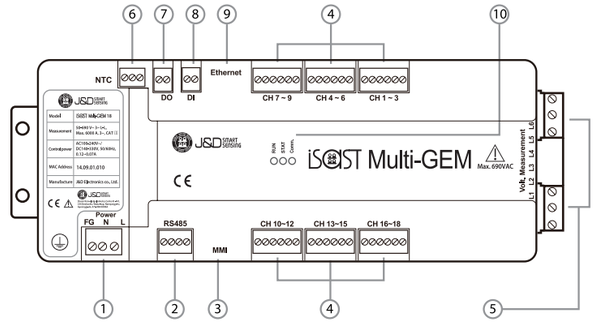
⚠ Warning

Multi-GEM should be installed inside of an electric Cabinet or Panel to prevent access to the terminals of Mulit-GEM by person after Multi-GEM is installed. Multi-GEM is an indoor product, therefore it needs to take care of not to be exposed external environment directly.

⚠ Warning

To avoid the risk of electric shock, this equipment must be only connected to a supply mains with protective earth.

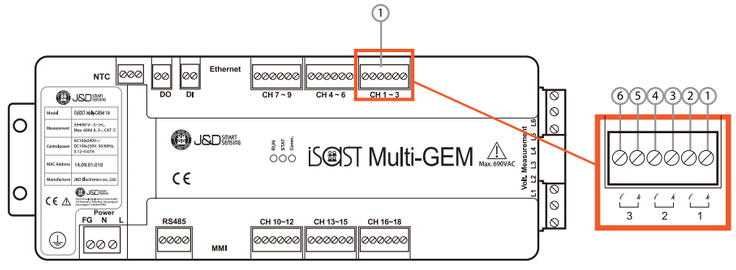
5. Name of parts



No.	Name	Description
1	Control Power	Supply the control power to the Multi-GEM (AC/DC100~240V)
2	RS485 Port	To connect to the External IO module or SCADA system purpose
3	MMI Port	RS232 Port to connect the configurator
4	1~18 CT Port	CT input terminal (rating is 100mA or 333mV max/secondary side of CT)
5	Voltage Input	Voltage input terminal for measurement
6	Temp.Terminal	NTC or 4~20mA input terminal
7	DO Terminal	Digital Output Terminal
8	DI Terminal	Digital Input Terminal (with 220Vac)
9	Ethernet Port	Communication with Master (Modbus Slave)
10	Status LED	RUN : Normal operation : blinking STAT : Normal metering : fast blinking Comm : Normal communication ※ blinking LED is normal Condition

6. CT Input Terminal

CTs are connected to this terminal. The secondary CT ratio is 100mA or 333mV by split & Rogowski coil CT. The terminal must meet the correct direction (K: Line / L: load) of CT to measure power correctly.

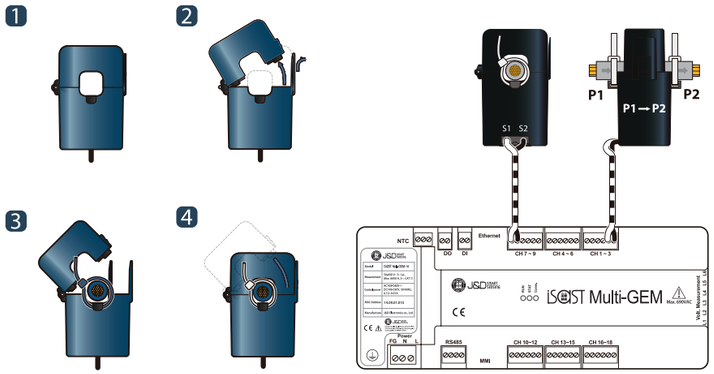


CH 1~9 : No.1 from the right side.
CH 10~18 : No. 10 from the left side.

Pin No.	Description
1,3,5	K side of CT
2,4,6	L side of CT

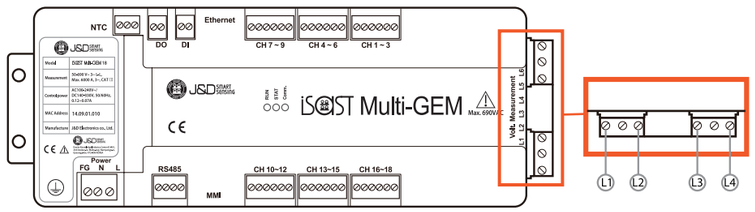
◆ Example of CT wiring

How to use ››››



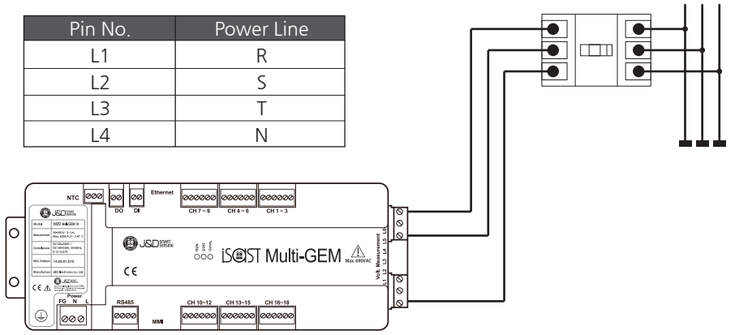
7. Voltage Input Terminal

It is for the voltage measurement. It should follow the voltage phase order to measure power correctly. It can be verified in the Vector diagram of MMI configurator easily.



■ Wiring of 3 Phase 4Wire system.

Pin No.	Power Line
L1	R
L2	S
L3	T
L4	N



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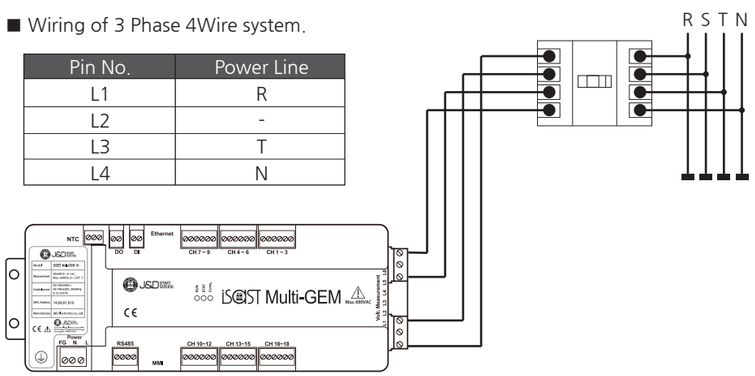

8. Dimention

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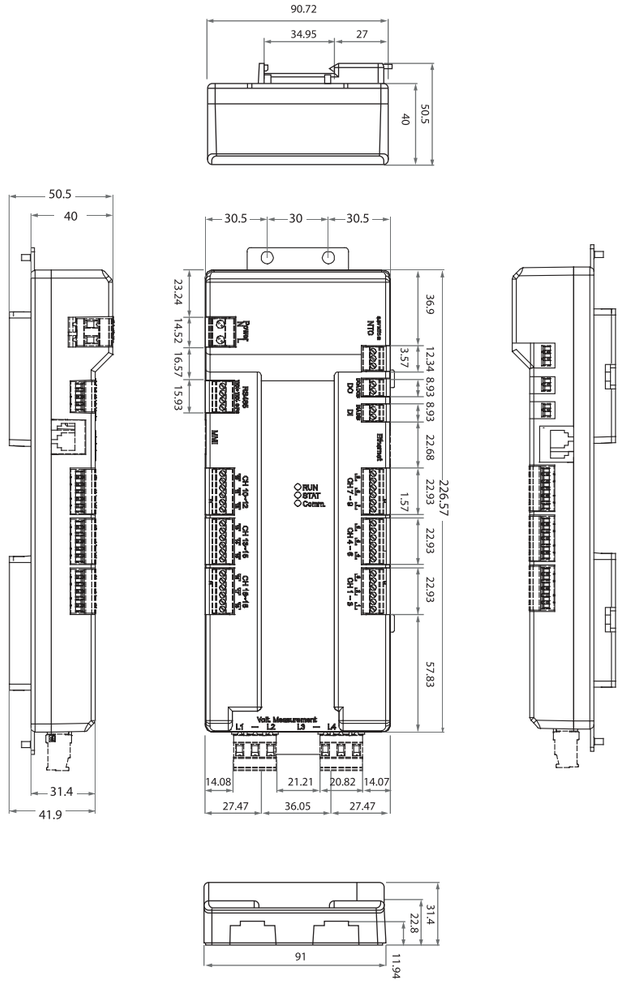
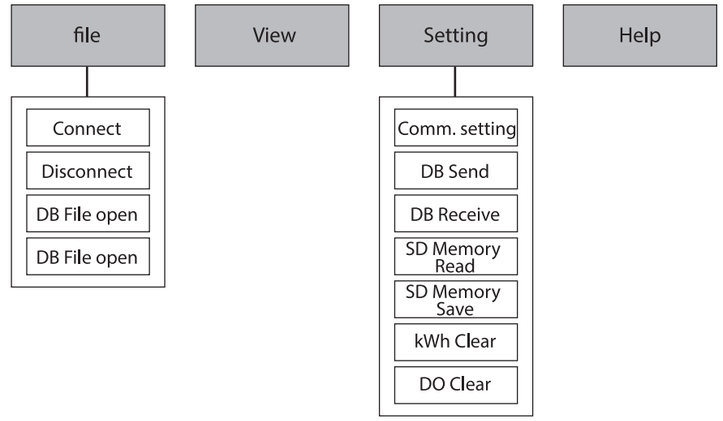


8. Configuration Software

For the more information of configuration software refer full version manual (soft copy) that you can get via e-mail and homepage.

1. Menu tree

1) Connect	PC connects the communication with MultiGEM.
2) Disconnect	PC disconnects the communication with MultiGEM.
3) DB File open	Open the setting database file of feeders stored in PC.
4) DB File save	Store the setting database file of feeders modified in PC.
5) Comm setting	It defines the communication configuration.
6) DB Send	It sends a feeder setting file to MultiGEM.
7) DB Receive	PC receives a feeder setting file configured data MultiGEM
8)SD Memory Read	Multi-GEM reads and stores the setting values and Energy data stored in SD memory of Multi-GEM. (It uses only when Multi-GEM is replaced)
9)SD Memory Write	Multi-GEM stores the setting values and Energy data in SD memory of Multi-GEM (It stores automatically every 1 hour)



9. Appendix

1. Accessory
- You have to use authorized CTs that used with Multi-GEM 12.
- You have to use CTs certified by IEC/UL standards.

⚠ Warning

It may cause the serious injury or death if a person handle the low and high voltage electricity with careless during installing and operating the product.

- Hazardous voltage always exists on the connecting terminal of PT/CT, Digital Input/Output, Control power always when it is on the power line
- Be sure to follow the safety instruction in this manual during installation and maintenance of the product. Keep the specified specifications and electric regulations.
- Take care that do not touch the terminals and wire sheath after the wiring is finished.

2. Limitation of responsibility

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