User's Guide – Multi-GEM 12

For the more information of Multi-GEM 12, please refer full version manual (soft copy) that you can get via e-mail and homepage.

1. Introduction

Multi-GEM 12 is installed in electric distribution and local panels for supplying power to their production line. It measure the voltage and current, and calculate the power in real-time. You can monitor and manage the energy of equipment. It can help to operate efficiently and to reduce the energy consumption.

This equipment is capable of accurate analysis and diagnosis equipment for various problems of energy management and power plants.

2. Characteristics

• Multi channel power meter (Multi-GEM 12) is able to measure and monitor multi electric power loads.
• Max 12 single phase or 4 3P4W feeders power monitoring
• Measurement : V (L-N, L-L) , A, Hz, PF, Unbalance, Power(P,Q,S), Energy (P,Q,S).
• 1.0/0.5 Class accuracy for power measurement conformed by IEC62053-21/IEC62053-22.
• Flexible application for the single phase/ 3phase4wire/ 3phase3wire power line.
• Sag/Swell / Over Current / Temp Alarm.
• Total Harmonics Distortion (THD)
• Support Ethernet (Modbus TCP) and Wi-Fi.
• Support cloud energy platform.
• Compact size to easy install in narrow space (62 x 96 x 56 mm)

3. Specification

Model		**Multi-GEM 12**
Power system		3P3W, 3P4W, 1P2W, 1P3W
Power Input		90 ~ 265 VAC, Max. 50/60 Hz
Measuring Inputs Rating	Voltage	380 V 3~ L-L (220V L-N), CAT Ⅲ Max. 6000 A, 3~
	Frequency	50/60 Hz
	CT type	100mA or 333mV
Communication		LAN Wi-Fi (Option)
Usage		옥내용
Altitude up to		2000 m 이하
Operating Temperature		-10℃~55℃
Storage Temp.		-25℃~70℃
Humidity		Maximum relative humidity 80% R.H. for temperatures up to 31 ℃ decreasing linearly to 50 % R.H. relative humidity at 40 ℃
Standards		IEC 62053-21/22

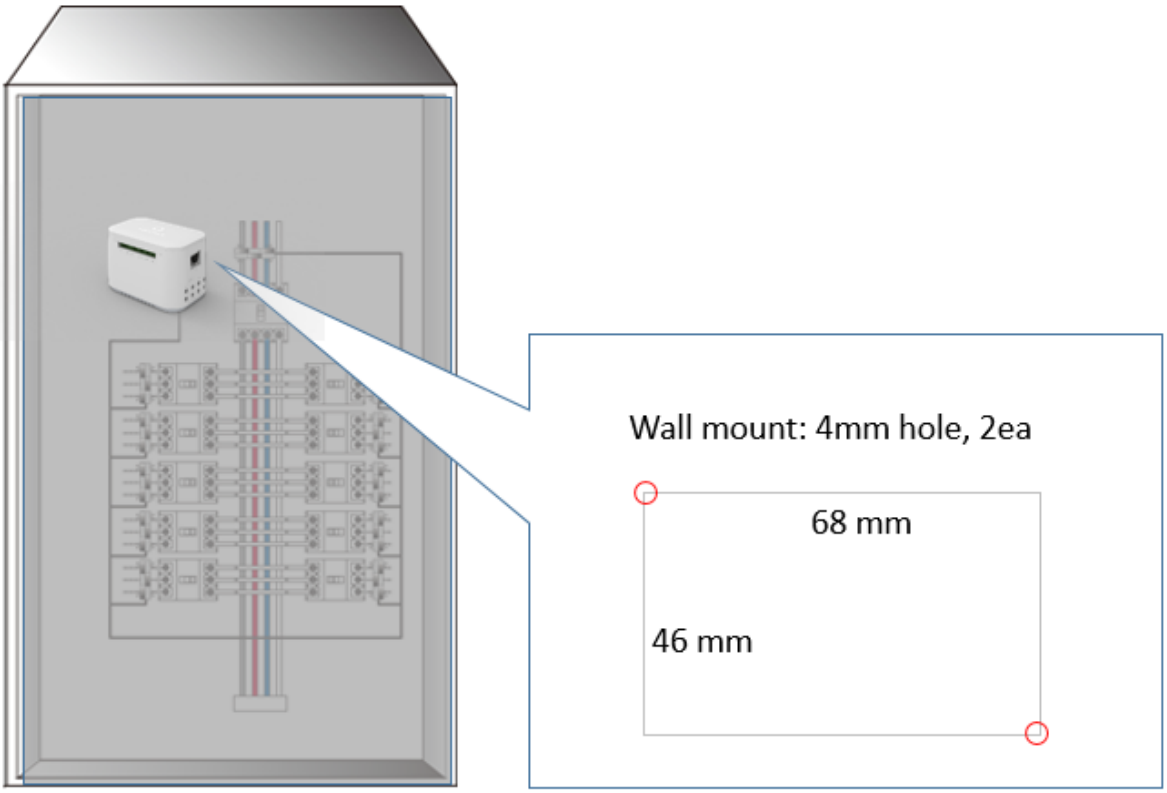
Measurement

Item	Display		Accuracy
	Unit	Digit	
Phase voltage	V	0.0 ~ 99,999	±0.2% Reading
Line voltage	V	0.0 ~ 99,999	±0.2% Reading
Line current	A	0.0 ~ 99,999	±0.2% Reading
Active power	W	±0 ~ 999,999,999	Class 0.5S
Reactive power	Var	±0 ~ 999,999,999	Class 0.5S
Apparent power	VA	0.0 ~ 999,999,999	Class 0.5S
Frequency	Hz	45.00 ~ 65.00	
Power Factor	%	± 100.00	
Temp. (NTC)	℃	-20.0 ~ 100.00	
Voltage unbalance	%	00 ~ 100.00	
Current unbalance	%	00 ~ 100.00	
Phase angle	°	00 ~ 360.00	
THD	%	00 ~ 100.00	±0.5% Full scale
Active Energy	kWh	0.0 ~ 999,999,999	
Reactive Energy	kVarh	0.0 ~ 999,999,999	
Apparent Energy	kVAh	0.0 ~ 999,999,999	

4. Installation

It needs to avoid a place where direct interference exists like as high temperature and electromagnetic field for the installation. Please check the environment condition around Multi-GEM 12 below for a correct operation.

Item	Condition
Location	Indoor
Operation temp,	-10°C to 55°C [14°F to 122°F]
Storage temp,	-25°C to 70°C [-13°F to 158°F]
Operation humidity	Non condensation,5% R.H. to 80% R.H.



1. Create two 4mm holes using the mounting hole guide in manual.

   ⇨ The upper left and lower right position of the 68 x 46mm rectangle.

2. Fix the product by using bolts provided.

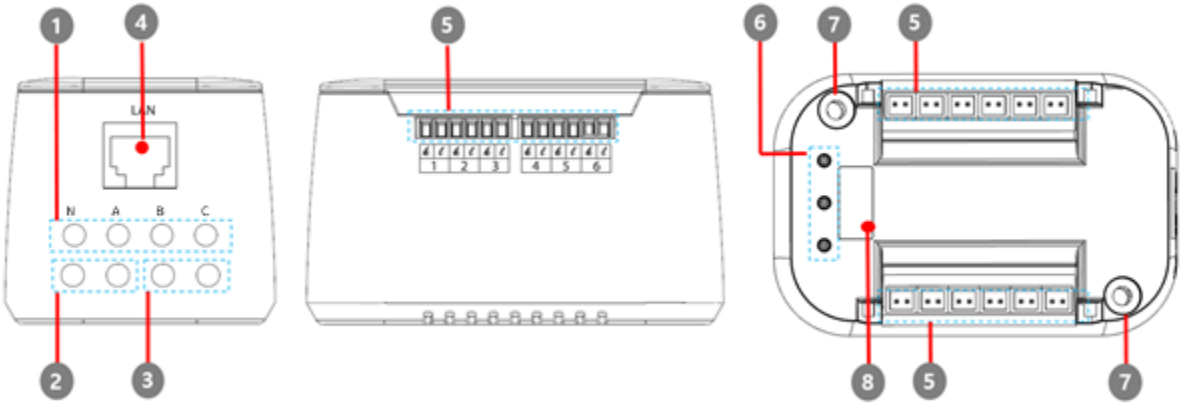
WARNING

Multi-GEM 12 should be installed inside of an electric Cabinet or Panel to prevent access to the terminals of Multi-GEM 12 by person after it is installed. Multi-GEM 12 is an indoor product, therefore it needs to take care not to be exposed external environment directly.

WARNING

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

5. Name of parts

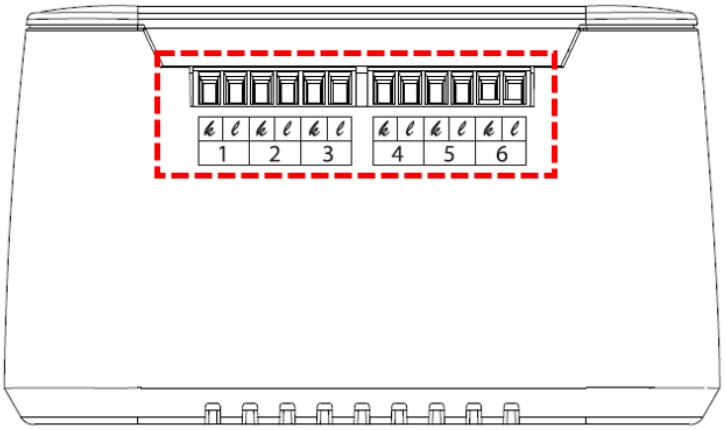


No.	Name	Description
1	Screw fixing holes	Screw holes for fixed terminals
2	Control Power	Supply the control power to the gems 3512 (AC/DC 100~240V) , Wire Size : 12 ~ 24AWG N : Neutral (AC), -(DC) connection A : Line (AC), +(DC) connection
3	Voltage Input	Voltage input terminal for measurement , Wire Size : 12 ~ 24AWG
4	Ethernet Port	Communication with Master (Modbus Slave) Protocol : Modbus TCP/IP Speed : 10/100 Mbps Automatic selection
5	CT Port	CT Input Terminal
6	Status LED	**Normal Version** RUN (LEFT) : blinking at normal operation STAT (CENTER) : fast blinking at normal metering Comm. (Right.) : blinking at normal communication

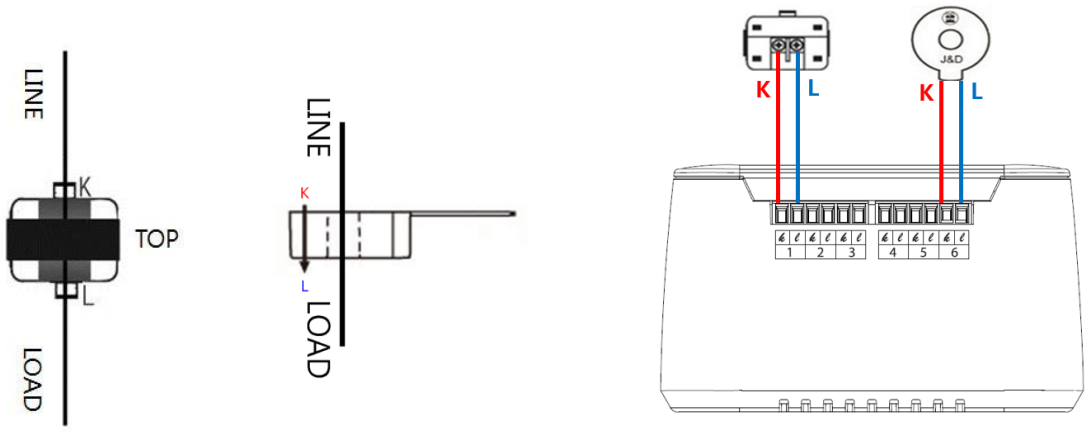
<table>
<tr><td></td><td></td><td>Cloud Version
<table>
<tr><th>Status \ LED</th><th>RUN (LEFT)</th><th>STAT (CENTER)</th><th>Comm. (Right)</th></tr>
<tr><td>Power connection</td><td colspan="3">ON</td></tr>
<tr><td>WIFI router connection ready(Soft AP)</td><td colspan="3">ON</td></tr>
<tr><td>WIFI router connection ready</td><td>BLK</td><td>OFF</td><td>OFF</td></tr>
<tr><td>The connection attempt to the Cloud</td><td>OFF</td><td>BLK</td><td>OFF</td></tr>
<tr><td>Device Authentication after the Cloud connect</td><td>OFF</td><td>OFF</td><td>BLK</td></tr>
<tr><td>Equipment installation complete</td><td>OFF</td><td>GLOW</td><td>OFF</td></tr>
<tr><td>Firmware Update</td><td colspan="3">BLK</td></tr>
</table></td></tr>
<tr><td>7</td><td>Wall mount</td><td>Bolt spec : D = 4mm / L = 55mm</td></tr>
<tr><td>8</td><td>Upgrade Port</td><td>Upgrade Port</td></tr>
</table>

6. CT Input Terminal

CTs are connected to this terminal. The terminal must meet the correct side of CT to measure power correctly.



Example of CT wiring

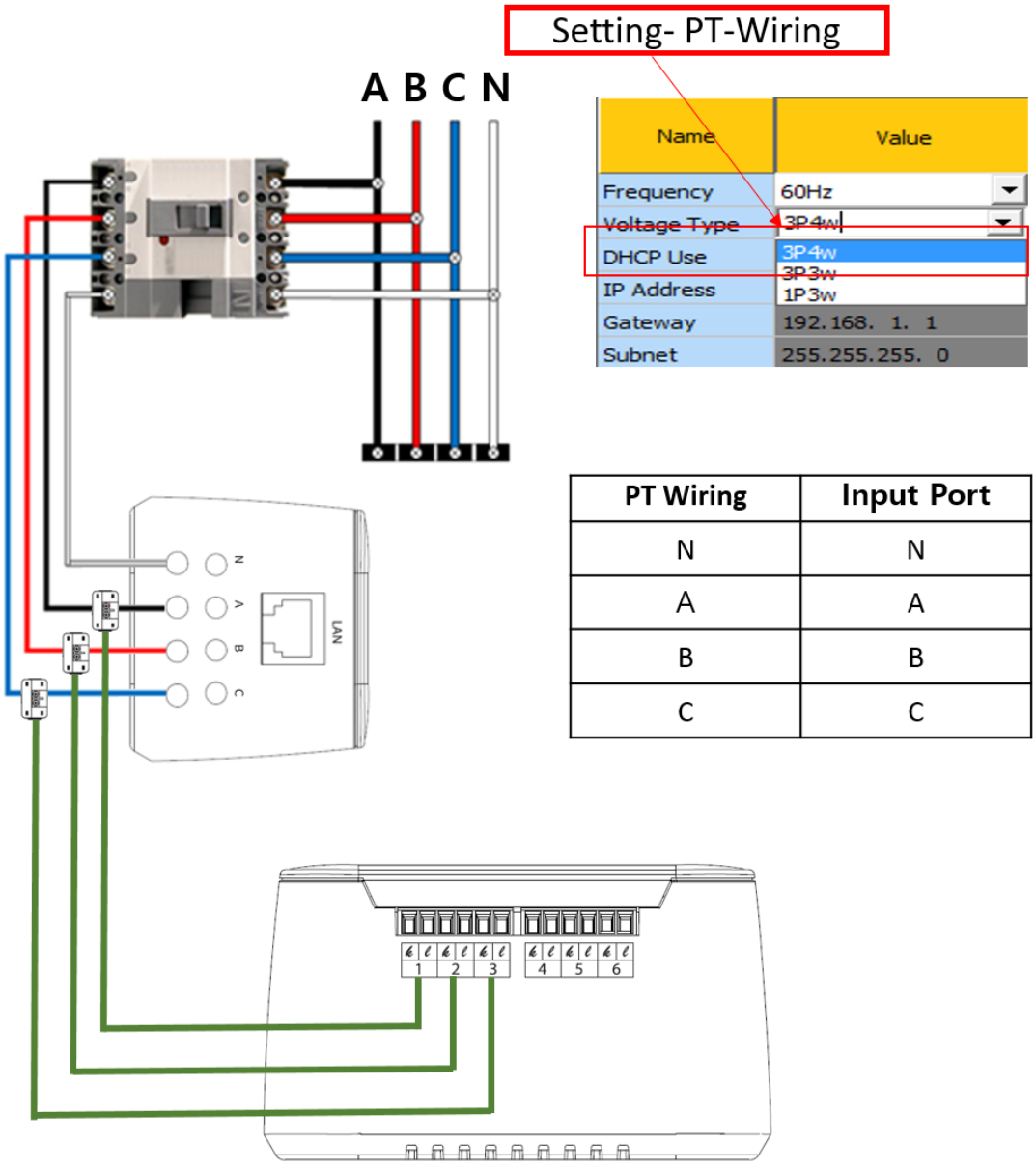


✓ Wiring with a CT should follow the direction of CT that power line side is at K of CT and Load side is at L of CT

8. Voltage Input Terminal

You can select the 1P3W, 3P4W or 3P3W by setting menu.

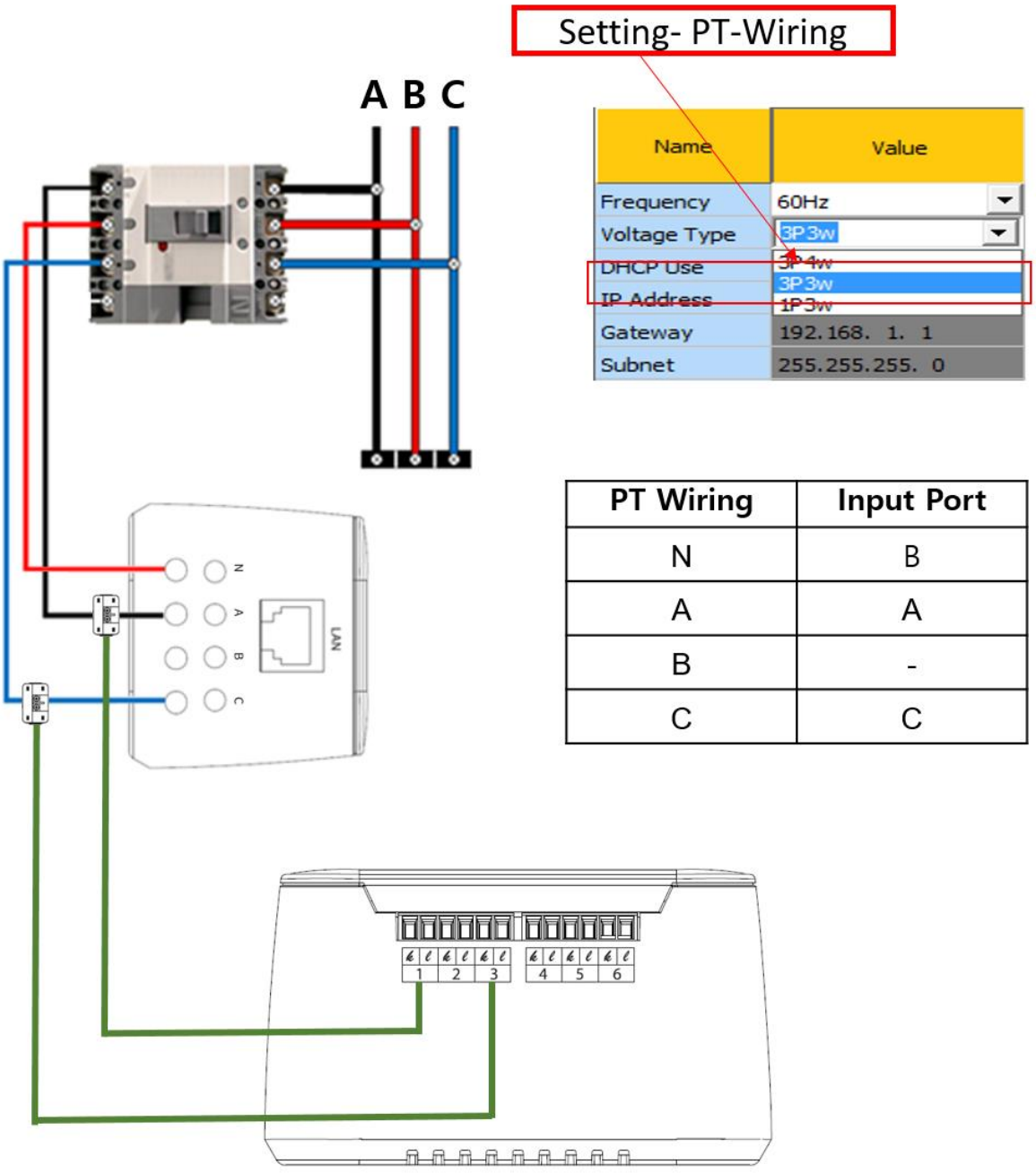
Wiring of 3Phase 4Wire system



PT Wiring	Input Port
N	N
A	A
B	B
C	C

CT Wiring	Input Port
A	1,4,7,10
B	2,5,8,11
C	3,6,9,12

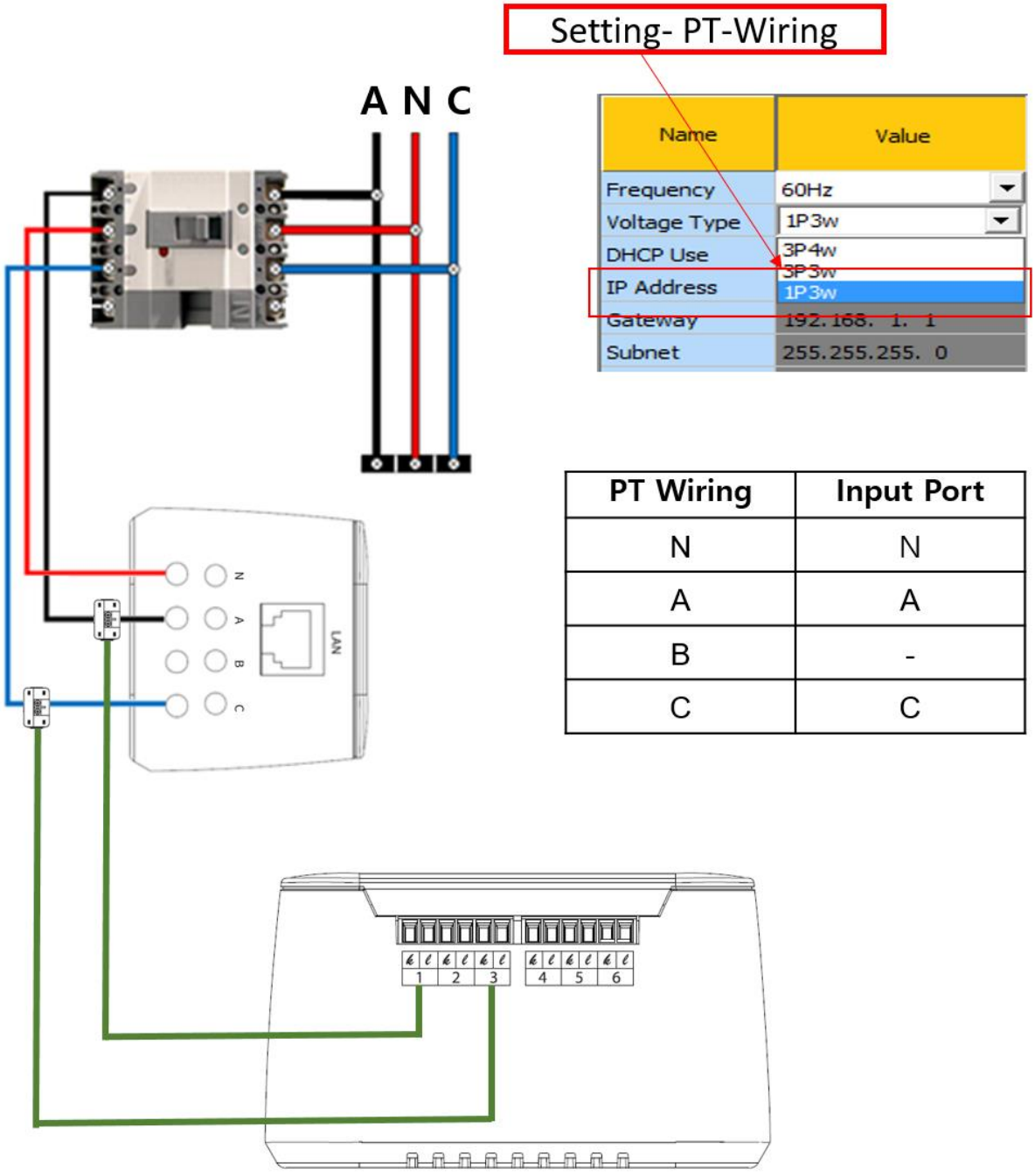
Wiring of 3Phase 3Wire system



PT Wiring	Input Port
N	B
A	A
B	-
C	C

CT Wiring	Input Port
A	1,4,7,10
C	3,6,9,12

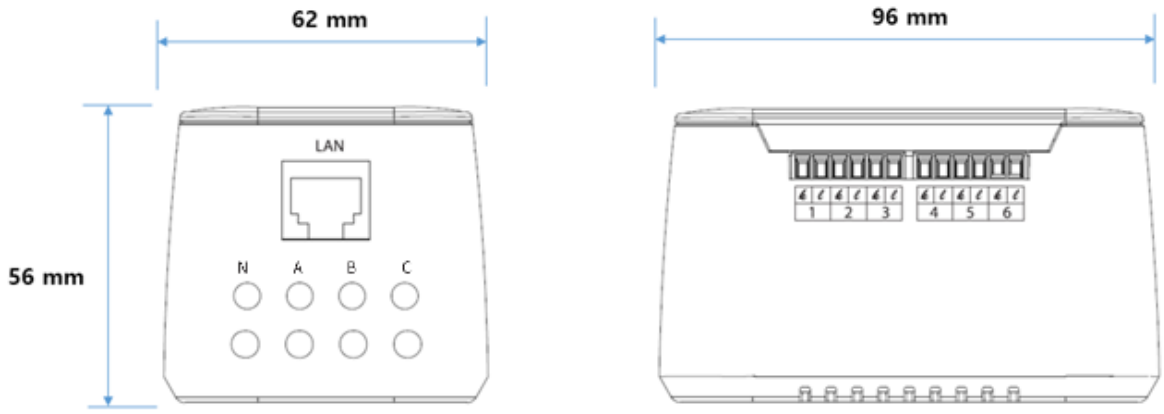
Wiring of 1Phase 3Wire system



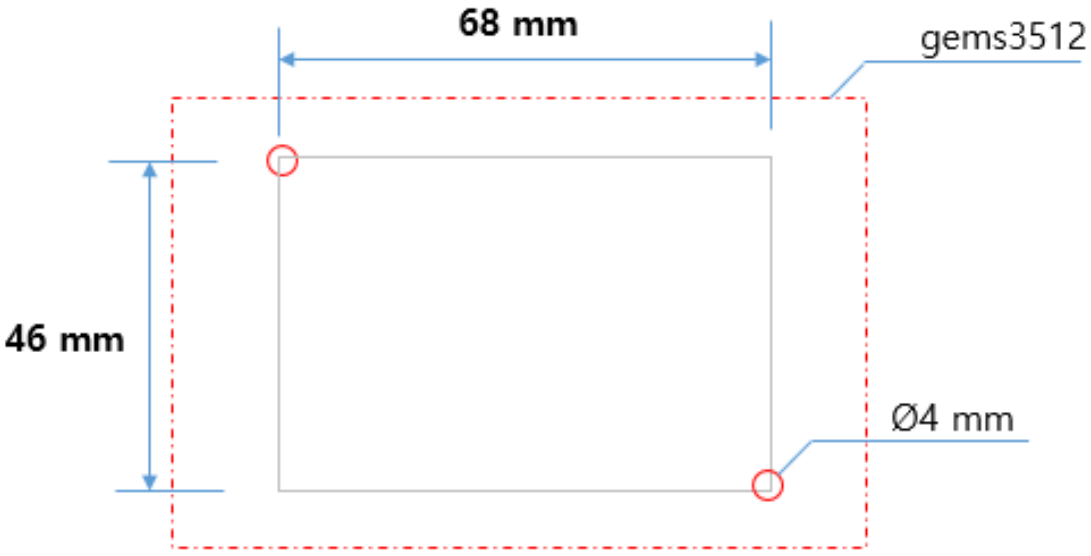
PT Wiring	Input Port
N	N
A	A
B	-
C	C

CT Wiring	Input Port
A	1,4,7,10
C	3,6,9,12

9. Dimension



Wall mount hole (Actual size)



10. Configuration software

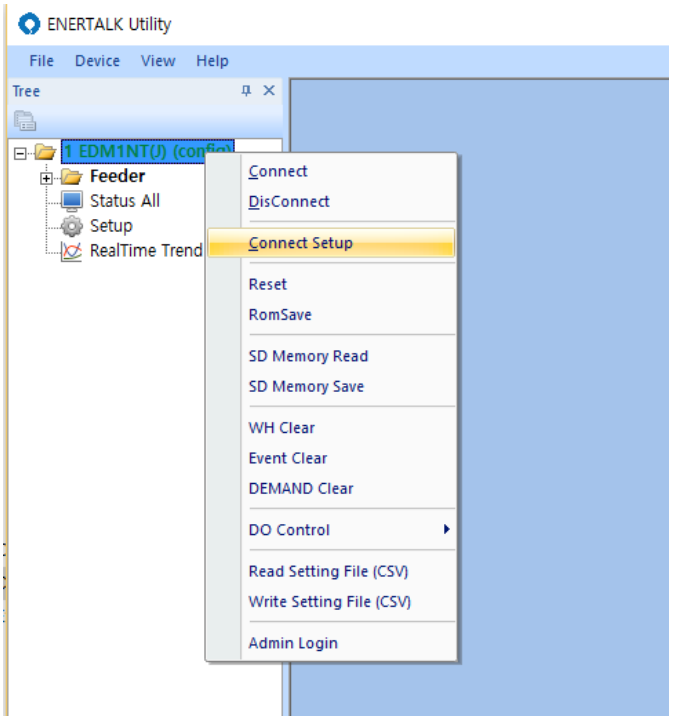
This configuration software is made for a user to put the settings and check the each data of the load simply. This version supports Windows7 (32/64 bit), Windows 8 (32/64 bit) and Windows 10 (32/64 bit).

> To use LAN, you should set the PC IP band as same as Multi-GEM 12.
>
> At the PC's network setting, please set IP address.
>
> Set : 192. 168. 7. nnn (nnn is available 1~255, except only 164)

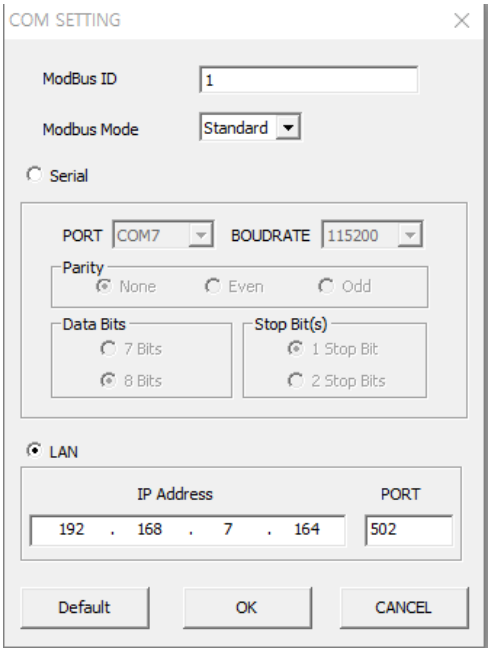
Connect Multi-GEM 12 to PC using LAN

The IP of the original factory shipment is "192.168.7.164".

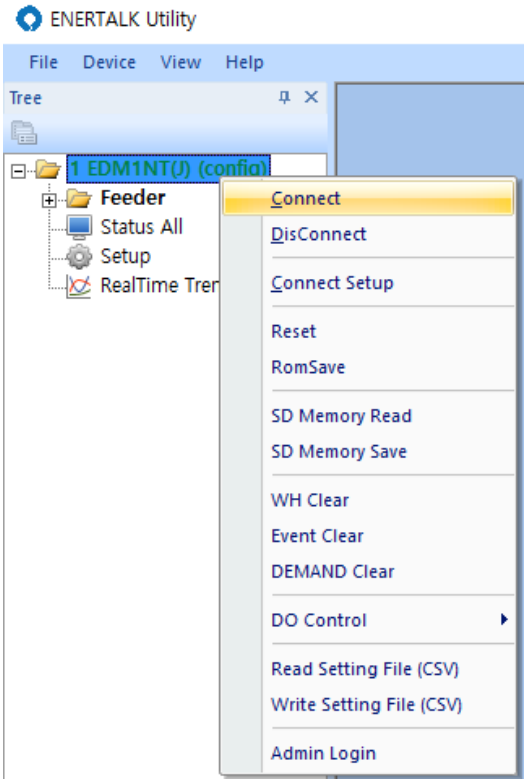
1. To use LAN, you should set the PC IP as 192.168.7.xx
2. Connect the LAN cable between the device and the PC.
3. Verify communication using the Ping check.
4. Running gems Utility at PC
5. If this is the first time, select Device->Add/Remove in menu.
   - Device Name : the installation location, such as an identifiable name, distributor name
   - Device Type : Select the gems3500.
   - Default Setting File : Select the file for reading preference.
   - File Read : Whether or not to execute the Default Setting File.
6. Click the right mouse button in the left pane, and then click Device connect Setup.


ENERTALK Utility
File
Device
View
Help
Tree
1 EDM1NT(J) (config)
Feeder
Status All
Setup
RealTime Trend
Connect
DisConnect
Connect Setup
Reset
RomSave
SD Memory Read
SD Memory Save
WH Clear
Event Clear
DEMAND Clear
DO Control
Read Setting File (CSV)
Write Setting File (CSV)
Admin Login

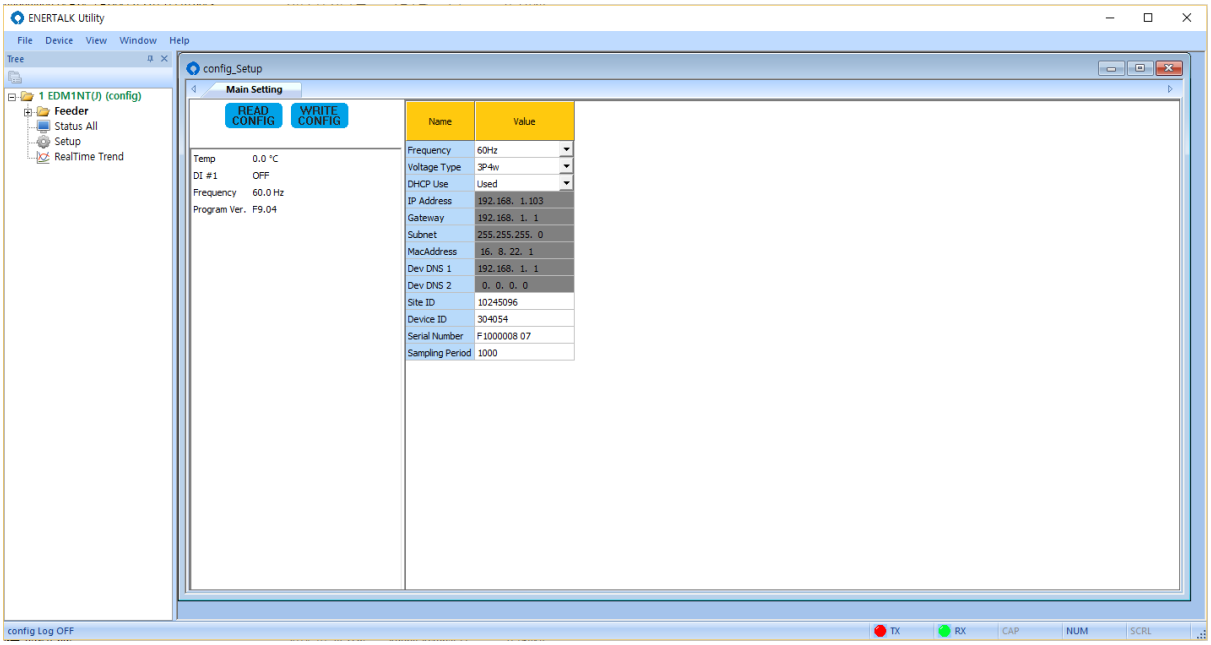
7. Select the LAN and then enter the IP address of the device.(Default IP : 192.168.7.164, Port : 502)



8. Click Connect to start the communication.



9. Click the Setup of the equipment.



10. Configuration – Press the READ CONFIG to call up the current setting of the device, and you can modify it. After the modifications down press WRITE CONFIG to save.

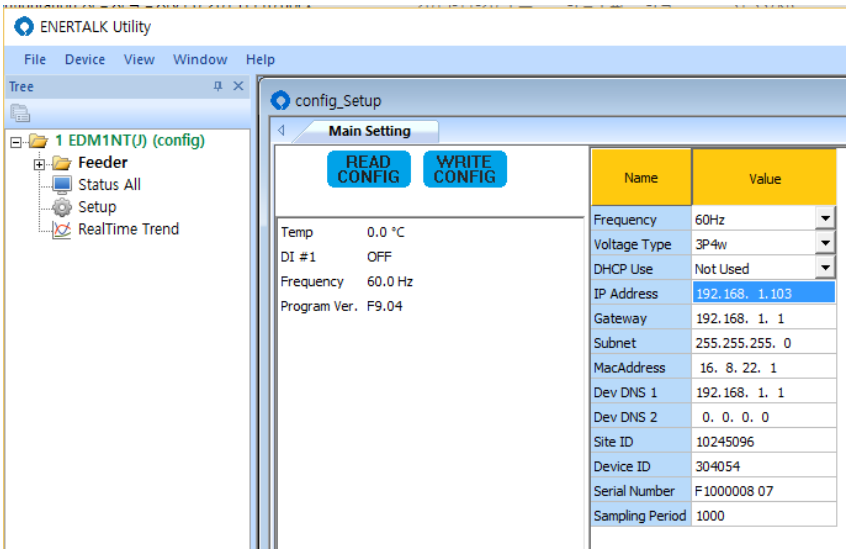
- Frequency : Select the frequency used. (50/60 Hz)

- Voltage Type : Select the Type of power measurement. (3P4W, 3P3W, 1P3W)

  (In the case of single phase to select the 3P4W.)

- DHCP Use : Disable – Static IP, Enable - Dynamic IP

  When set to Not Used, you can enter the IP.



- Site ID : Enter the Site ID.
- Device ID : Enter the Device ID.
- Serial Number : You can only read this field.
- Sampling Period : data transmission period to Cloud. (Default 1 second, 1000)

11. Appendix

1. Accessory

1. You have to use authorized CTs that used with Multi-GEM 12.

2. You have to use CTs certified by IEC/UL standards.

2. Meter Calibration

Calibration of Multi-GEM 12.

A significant drift in calibration is unlikely. Therefore, a yearly re-calibration of meter as generally no required.

Current channel and volt channel can be calibrated by qualified site technicians, if a stable calibration source can be applied.

Calibration on Multi-GEM 12 requires precise input of 220 Volts, 5 Amps or 20 Amps.

If this equipment is unavailable, contact agency for assistance.

3. Explanation of Symbols

	**WARNING** **This notice used to identify conditions under which improper use of the product may cause death or serious personal injury.**
	**CAUTION** **This notice used to identify conditions under which improper use of the product may cause minor personal injury.**
	**PROTECTIVE CONDUCTOR TERMINAL.** **IEC 60417-5019 (2006-08)**
	**ALTERNATING CURRENT** **IEC 60417-5032 (2002-10)**

	**Operating Instructions** ISO 7000-1641

3. Safety instructions

WARNING

It can cause serious injury or death to persons if careless handling with the low and high voltage electricity during installation and operation of 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.

Caution

For protection against electrical shock, all accessories, such as Personal computer and etc, must be certified by IEC standard.

Definition of measurement category

1) Measurement category IV is for measurements performed at the source of the low-voltage installation.

2) Measurement category III is for measurements performed in the building installation.

3) Measurement category II is for measurements performed on circuits directly connected to the low voltage installation.

4) Measurement category I is for measurements performed on circuits not directly connected to MAINS.

Caution

A fused branch circuit protection, rated at 250V/20A maximum, with isolator must be installed on the main incoming power supply, external to the unit. The branch circuit fused isolator must be fitted with two UL listed 250Vac/2.0A rated fuses, one on the live and one on the neutral supply circuits. The fuses must comply with UL 248-4, Class CC, Guide JDDZ and be contained by Class CC fuse holders.

A suitable switch or circuit-break, meeting IEC60947-1 and IEC 60947-3, shall be used as a means of disconnection.

Use at least AWG 18(maximum AWG 14) wires for the incoming supply.

For field wiring terminals use copper conductors rated 75°C only, Field wiring tightening torque1.2Nm

Caution

The following part is considered the equipment disconnecting device.

A switch or circuit-breaker shall be included in the building installation. The switch shall be in close proximity to the equipment and within easy reach of the operator. The switch shall be marked as the disconnecting device for the equipment

Caution

To clean the meter, wipe it with a clean, dry cloth.

Caution

Installation of the meter must be performed only by qualified personnel who follow standard safety precautions during all procedures. Those personnel should have appropriate training and experience with high voltage devices. Appropriate safety gloves, safety glasses and protective clothing are recommended.

- If THE EQUIPMENT IS USED IN A MANNER NOT SPECIFIED BY THE MANUFACTURER, THE PROTECTION PROVIDED BY THE EQUIPMENT MAY BE IMPAIRED.
- THERE IS NO REQUIRED PREVENTE MAINTENANCE OR INSPECTION NECESSARY FOR SAFETY. HOWEVER, ANY REPAIR OR MAINTENANCE SHOULD BE PERFORMED BY THE FACTORY.

- First of all, be sure to read this manual for correct use of the product.
- If you find any missing contents or error, please inform us.
- NTEK system assumes no responsibility for any direct or indirect loss or damage which may occur through use of this product, regardless of any failure to perform on the part of this product.

Standard

CE

Manufacture Information

J&D Electronics Co., Ltd.

Head office & Factory B-401 Dosim Knowledge Industry center, 234 Deokso-ro, Wabu-eup, Namyangju-si, Gyeonggi-do, 472-908 South Korea

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