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Digital Power Meter GIMAC—i User Manual

HIGH MEASURING ACCURACY





- Read this manual carefully before installing, wiring, operating, servicing or inspecting this equipment.
- . Keep this manual within easy reach for quick reference.



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Safety precaution

The attention subject for the safety

Warning

- Please do not operate, inspect, and install by yourself.
- Please do not wiring operation when it is applied with power or on the operation; it may result in electric shock.
- Please do not all the wiring operation with the live bus bar; it may result in electric shock or fire and property damage by charging voltage of current transformer.
- Please put to earth; it may result in electric shock.
- Please do not attempt to disassemble even when the power not applied; it may result in electric shock by charging current remained in the product.
- Please do not short-circuit the secondary part of PT; it may result in fire
- Please do not disconnection the secondary part of CT; it may result in fire or explosives
- Please do not wire or operate with wet hands; it may result in electric shock.
- Please do not use any damaged cable; it may result in electric shock.
- Please use the ring terminal when wiring the cable; it may result in electric shock by bare wire.
- Please work after wearing safety gear.
- Please work after installing the safety caution sign.
- Please perform the withstanding voltage test or the insulation resistance test of the switchboard installed with products after disconnecting all wires.

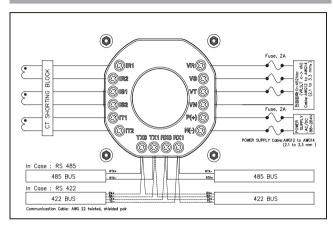
Safety precaution

The attention subject for the safety



- Safety caution for installation & terminal wiring
 - Apply the rated voltage to the power supply terminal; it may result in property damage or fire.
 - Please keep away product from screws, metals, water, or oil; it
 may result in fire.
 - Please keep the rated load and polarity for input & output contacts; it may result in property damage or fire.
 - Please wire to the terminal block after checking the terminal number; it may result in property damage or fire.
 - Please assemble terminal cover after wiring the terminal.
 - Specialist help shall be sought for the installation and maintenance of product; it may result in malfunction or accident.
- Inspection item before power supply being applied
 - Check the voltage or polarity of control power supply.
 - Check the wiring condition of input / output terminal.
- Caution for storage & handing
 - Please store dry & clean place.
 - Please do not throw or put force on it during transport; it may result in malfunction or wrong operation.
 - Please do not load over 10 stories.
- Caution for disposal
 - Please dispose of it in accordance with industrial waste regulation.

1. The information of installation



< PIC 1 The configuration of terminal & wiring connection >

- 1) Please cut in accordance with DIN 96 or AINSI 4 to the installation position. Please refer to "External Dimensions & Cut-out" for the detail
- 2) Please connect the power supply line. Please do not close the power supply before finishing the PT/CT Wiring connection. The rating of power supply is in the range of AC/DC 88~264V.
- 3) Please connect the corresponding wires to voltage & current input terminal side. Please refer to "Wiring connection" for the detail.

1 The information of installation

- 4) Please connect the communication cable if the product has the function of communication. Please refer to "The wiring connection of communication cable" for the detail.
- 5) Apply the power supply after closing the Fuse of voltage input Terminal side and opening CT SHORTING BLOCK.
- 6) Please do the device setting Please refer to "Setting method" for the detail.
 - < Simple setting method >
- Move to "Setting Menu" if pressing [UP]. [DOWN] KEY at the Same time.
- The initial window of setting window displays the wiring connection as "Conn".
- Press [UP], [DOWN] KEY to move between setting items.
- If pressing [ENTER] KEY at setting item, it will be blinking to indicate its possible setting change.
- After changing the setting by [UP], [DOWN] KEY, press [ENTER] KFY to store it
- If pressing [UP], [DOWN] KEY at the same time after finishing all setting, it turns back to the measurement window.

2. The characteristic of GIMAC-i

GIMAC-i is the digital integrated equipment for measuring/displays the various electricity quantities (Three-phase voltage/current, electric power, electric energy, PF, frequency, Demand current, MAX). It is device used for switchboard and available for 1P 2W, 1P 3W, 3P 3W Delta, 3P 3W Y, 3P 4W connection.

GIMAC-I is convenient to use for customer with following characteristics.

The high measuring accuracy

It guarantees the high reliability by keeping the accuracy even in which the frequency is variable, 0.3 %(Real Scale) for voltage at the rated voltage of 10V~452V, 0.3%(Full Scale) for current at the current of 0.05~6A (CT 5A), 0.01~1,2A (CT 1A) and 0.5 Class in accordance with IEC1036 for electric power and energy.

◆ The wide range of PT input voltage (AC380V)

It is and easy to install as the voltage of AC $10\sim380V + 120\%$ (AC10 $\sim 452V$) can be input directly without extra primary PT.

The various measurements

It has 3 windows which measure/display the measuring values, 13 measuring values for Non-Extensible Type(NO TYPE) and 40 measuring values for Extensible Type(EX TYPE).

2. The characteristic of GIMAC-i

Compact size of external dimension & Cutting Size of Panel The external dimension is 144(W) x 144(H) x 85(D) mm and Cutting Size of Panel is designed to comply with DIN 96 and AINSI 4.

RS485/RS422 MODBUS

It provides MODBUS RTU protocol on RS 485/422

Free voltage of control power

It is available for the various control power environment with the range of AC/DC 88~264V.

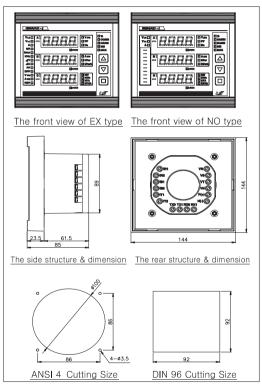
The check of wrong connection

The wrong connection of PT can be prevented by displaying it to user after judging the faults based on the phase rotating direction of voltage. (Only of 3P 4W & 3P 3W Y Connection)

Automatic Scroll

If pressing [DOWN] $KEY(\nabla)$ & [ENTER] $KEY(\square)$ at the same time, Measuring elements are automatically scrolled every 10 secs.

3. The structure of product



< PIC 2 The external structure & dimension of product >

4.1 The standard using condition

This product shall be used under standard using condition except the extra condition specified.

- 1) Temperature
 - Operating temperature range: -10°C ~ 55°C
 - Storage temperature range: -25°C ~ 70°C
- 2) Humidity: Less than 80% (But, shall not reach the dew point)
- 3) Using condition
 - Altitude: Less than 2,000m
 - Shall be no abnormal vibration or impulse
 - The ambient air shall not be severely polluted

4.2 Input rating

< Table 1 Input rating >

Type	Applicable range	Remark	
Wiring connection	1P2W, 1P3W, 3P3W(Y), 3P3W(Delta),3P4W		
The rated frequency	60 Hz or 50 Hz	Separate use of 50Hz, 60Hz	
Measuring voltage	10 ~ 452 V	The voltage applied between VR,VS,VT and VN	
Measuring current	0.05 ~ 6 A(5A), 0.01 ~ 1.2 A(1A)		
CT rated current	5 A or 1A		
PT & CT Input burden	Less than 0.5 VA for each		
Control power	AC/DC 88~264V(Free Voltage)		
Power consumption	Less than 2 W		

4.3 Noise rating

This product shall comply with the noise rating table given below.

< Table 2 Noise rating >

Item	Condition	Applicable standard
Insulation resistance	500 V, Over10MΩ	IEC60255 - 5
Power frequency withstand voltage	AC 2 kV (1.5 kV)	IEC60255 - 5
Lighting impulse withstand voltage	5 kV(3 kV)	IEC60255 - 22 IEC61000 - 4
Vibrating surge voltage	2.5 ~ 3 kV	IEC60255 - 22 EN61000 - 4
Surge Immunity	Surge Immunity Control power, Transformer: 6 kV 5times	
Fast Transient Burst	Control power, Transformer: 4 kV 1min	IEC60255 - 22 EN61000 - 4 - 4
Impulse Noise Immunity		
Static electricity ESD	I Air : 8kV (:ontact : 6kV	
Radio frequency Radioactive 10 V/m immunity		IEC60255 - 22
Radio frequency conductivity	10 V	IEC60255 - 22
Electromagnetic wave conduction 0.15 ~ 0.5 MHz : 79(66) dBuV 0.5 ~ 30 MHz : 73(60) dBuV		IEC60255 - 22

4.4 Measurement item & Accuracy rate

< Table 3 The measurement item & Accuracy rate >

Туре	Measuring element	Measuring element in detail	NO TYPE	EX TYPE	Accura cy (%)	Remar k
	Average voltage	Vavg	0	0	0.30%	
Voltage	Line voltage	Vab, Vbc, Vca	0	0	0.30%	
	Phase voltage	Va, Vb, Vc	0	0	0.30%	
	Average current	lavg	0	0	0.30%	F/S
Current	Line current	la,lb,lc	0	0	0.30%	F/S
	Load factor	Load factor la, lb, lc	0	0	-	
	Line-to-line voltage	∠VabVbc, ∠VabVca	Х	0	0.5°	3P3W
Phase	Between line-to - current	∠Vabla, ∠Vablb, ∠Vab l c	Х	0	0.5*	3P3W
Tilase	Between phase voltages	∠VaVb,∠VaVc	Х	0	0.5*	3P4W
	Between phase voltage and current	∠Vala, ∠Vb l b, ∠Vclc	Х	0	0.5°	3P4W
	Total active power (reverse)	Р	0	0	0.50%	IEC 62053-22
	Active power(reverse)	Pa, Pb, Pc	Х	0	0.50%	IEC 62053-22
Electric	Total reactive power(reverse)	Q	0	0	0.50%	IEC 62053-22
Power	Reactive power(reverse)	Qa, Qb, Qc	Х	0	0.50%	IEC 62053-22
	Total apparent power	S	0	0	0.50%	IEC 62053-22
	Apparent power	Sa, Sb, Sc	Х	0	0.50%	IEC 62053-22

4.4 Measurement item & Accuracy rate

Electric Energy	Active electric energy	WH	0	0	0.50%	IEC 62053-22
	Reactive electric energy	VARH	0	0	0.50%	IEC 62053-22
	Reverse active electric energy	rWH	Х	0	0.50%	IEC 62053-22
	Reverse reactive electric energy	rVARH	Х	0	0.50%	IEC 62053-22
	Apparent electric energy	VAH	0	0	0.50%	IEC 62053-22
freq	Frequency	Frequency (Hz)	0	0	0.05Hz	
	Total PF	PF	0	0	Following phase error	+:Lag
Power factor	PF	PFa, PFb, PFc	Х	0	Following phase error	=:
	Fundamental PF (DPF)	DPFa,DPFb,DPFc	Х	0	Following phase error	Lead
THD	Voltage THD	THD of Va(ab), Vb(bc), Vc(ca)	Х	0	-	-
	Current THD	THD of Ia, Ib, Ic	Х	0	-	-
Harmoni	Voltage harmonics	1 nd ~15 th of Va(ab),Vb(bc), Vc(ca) 1 nd ~15 th	Х	0	-	-
CS	Current harmonics	1 nd ~ 15 th harmonics of Ia, Ib, Ic	Х	0	ı	-
Demand	Active electric power	Demand W	Х	0	-	-
	Demand current	demand la, lb, lc, lavg	Х	0	-	-
MAX	Current	max la,max lb,max lc, max lavg	Х	0	=	-

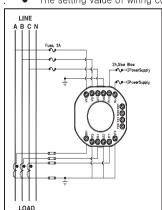
5.1 The wiring connection of PT/CT

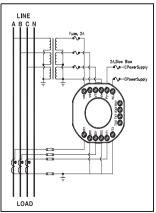


- The secondary part of PT/CT & VN terminal shall be grounded.
- Cable of adequate size is from AWG14 to AWG12 (2,1~3,3 mm²).
- The tightening torque of terminal is less than 10kgk-cm.
- Since the R-phase voltage is used as a reference for all measured values, be sure to wire it.
- If the R phase voltage is not applied (V_R = 0V), Measurement accurancy can't be guaranteed.
- ▶ If the R phase voltage is not applied(V_R =0V), the R, S and T phase of voltages and the line to line voltage V_{tt} values are displayed as '0', also the current phase and power are measured based on voltage phase '0'. (If V_R =0V \angle R = \angle S = \angle T = 0 and V_{tt} = 0.)
- If no voltage is applied to R phase and S phase, R phase and T phase or R. S. T (V_n =V_s =0, V_n =V_s =0, V_n =V_s =V_s =V_s =0), the frequency is indicated as '0'.

1) 3P 4W Connection

- The possible voltage range which can be set directly without PT is 10~380V(+120%) based on the phase voltage.
- The setting value of wiring connection is "5" for 3P 4W.



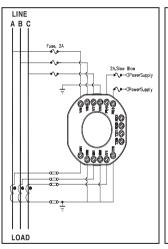


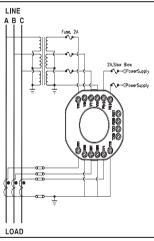
< PIC 3 3P 4W direct connection > < PIC 4 3P 4W connection with 3PT >

5.1 The wiring connection of PT/CT

2) 3P 3W - Y Connection

- The possible voltage range which can be set directly without PT is 17.3~658.2V based on the phase voltage.
- The setting value of wiring connection is "4" for 3P 3W Y.



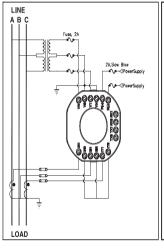


< PIC 5 3P 3W direct connection >~< PIC 5 3P 3W connection with 3PT >

5.1 The wiring connection of PT/CT

3) 3P 3W - Open Delta Connection

The setting value of wiring connection is "3" for 3P 3W Delta.



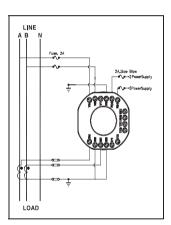
- The voltage of Vca is calculated by the combination of Vab and Vcb in in case of using 2PT. Thus, there will be a voltage error of Vca will unbalanced voltage
- The S phase current is calculated by the combination of A and C phase current in case of using 2CT Thus, there will be a current error in B phase current with the unbalanced load
- There will be error in electric power with unbalanced load. Thus, please use with balanced load.

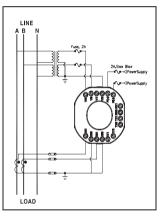
< PIC 7 3P 3W delta connection with 2PT, 2CT >

5.1 The wiring connection of PT/CT

4) 1P 3W Connection

- The possible voltage range which can be set directly without PT 10~380V(+120%) based on the phase voltage.
- The setting value of wiring connection is "2" for 1P 3W.



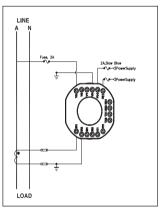


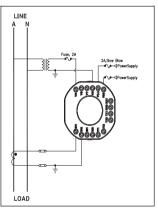
< PIC 8 1P 3W direct connection > < PIC 9 1P 3W connection with PT >

5.1 The wiring connection of PT/CT

5) 1P 2W Connection

- The possible voltage range which can be set directly without PT is 10~380V(+120%) based on the phase voltage.
- The setting value of wiring connection is "1" for 1P 2W.

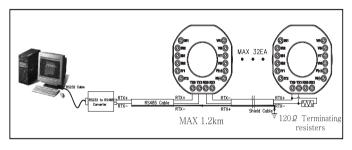




< PIC 10 1P 2W direct connection > < PIC 11 1P 2W connection with PT >

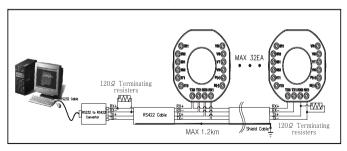
5.2 Communication Wiring Connection

- The spec of communication cable : AWG22, Twisted Shield Pair
 Cable
- 2) RS-485 Communication Wiring Connection



< PIC 12 RS-485 Communication Wiring Connection >

3) RS-422 Communication Wiring Connection

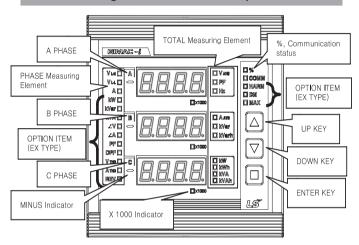


< PIC 13 RS-422 Communication Wiring Connection >

5.2 Communication Wiring Connection

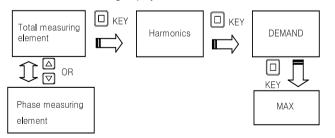
- The shield of communication cable shall be connected and be grounded.
- Attach the 1/4W, 120Ω resistor between (+) and (-) terminal at the edge.
- The maximum unit which can be connected is 32 units.
- The maximum communication distance is 1.2km.
- The COMM LED is turned on when corresponding with the signal.

6.1 Measuring DISPLAY MODE & Operation



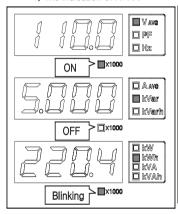
Total measuring element, Phase measuring element, harmonics, Demand, MAX are checked from Measuring DISPLAY MODE.

The order of measuring display mode is as follows.



6.1 Measuring DISPLAY MODE & Operation

1) The indication of X1000



X 1000 LED indicates that displayed value shall be multiplied by 1,000(ON) or 1,000,000(Blinking) to know the real value. When X 1000 LED is ON, the real value shall be multiplied by 1,000. When X 1000 LED is blinking, the real value shall be multiplied by 1,000,000. Refer to the following example.

Displayed value X 1000 LED Real value
110.0 ON 110 x 1,000
5.000 OFF 5,000
220.4 Blinking 220.4 x 1,000,000

< PIC 15 X1000 LFD >

2) Indication of Total measuring element

< Table 4 Total measuring element >



- V_{AVG} is for average voltage which indicates the average of phase voltages in case of 3P 4W and 1P 3W and that of line voltages in case of 3P 3W. The marking unit is V.
- PF displays Total PF. The value is in the range of -1.0 ~ 1.0.
- Hz indicates the frequency.

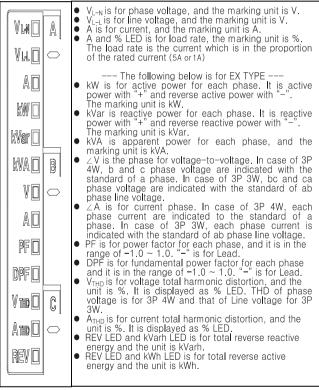
6.1 Measuring DISPLAY MODE & Operation

O A avg O kVar O kVarh	 A AVG is the average current and it indicates the average value of three currents incase of 3P3W/3P4W and that of two currents in case of 1P 3W. The marking unit is A. kVar is Total reactive power and it indicates the reactive power with "+" and reverse reactive power with "-". The marking unit is kVar. kVarh is reactive energy and accumulated to the maximum of 1,000,000,000,000 Varh. If it is over the maximum value, it is accumulated from 0 Varh again. The marking unit is kVarh.
kw kwh kva kvah	 kW is the Total active power and it indicates the active power with "+" and reverse active power with "-". The marking unit is kW. kWh is the active energy and accumulated to the maximum of 1,000,000,000,000 Wh. If it is over the maximum value, it is accumulated from 0 Wh again The marking unit is kWh. kVA is apparent power and marking unit is kVA. kVAh is apparent energy and accumulated to the maximum of 1,000,000,000,000 VAh. If it is over the maximum value, it is accumulated from 0VAh again. The marking unit is kVAh.

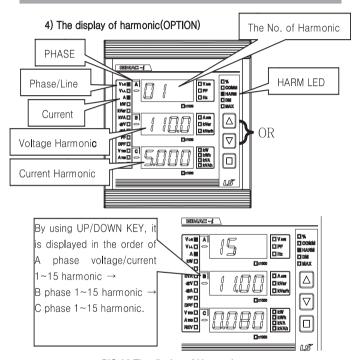
6.1 Measuring DISPLAY MODE & Operation

3) Indication of phase measuring element

< Table 5 The display of phase measuring element >



6.1 Measuring DISPLAY MODE & Operation



< PIC 16 The display of Harmonics >

It goes to the Harmonic display mode in case of EX TYPE, if pressing [ENTER] KEY from TOTAL or PHASE measuring display. Harmonic is

6.1 Measuring DISPLAY MODE & Operation

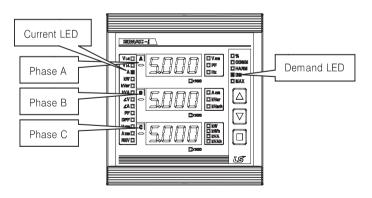
measured from 1st harmonic to 15th harmonic and it is moved to following harmonic number by pressing [UP], [DOWN] KEY.

It is displayed in following order: A phase voltage/current first harmonic →15th harmonic→B phase voltage/current first harmonic→15th harmonic →C phase voltage/current first harmonic→15th harmonic.

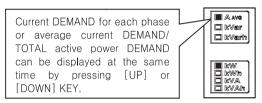
 V_{L-N} LED is turned on in case of 3P 4W to indicate it is the harmonics for phase voltage and V_{L-L} LED is turned on in case of 3P 3W to indicate it is the harmonics for line voltage.

5) The display of DEMAND(OPTION)

It goes to the Demand display mode in case of EX TYPE, if pressing [ENTER] KEY from the Harmonic display mode.



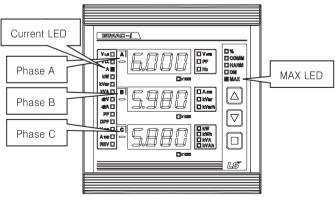
6.1 Measuring DISPLAY MODE & Operation



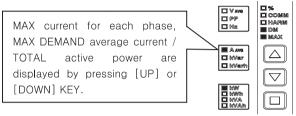
< PIC 17 The display of DEMAND >

Demand display mode is indicated by turning DM LED on and the measuring elements of demand such as current demand for each phase, the average current demand, and total active power demand are displayed by pressing [UP]/ [DOWN] KEY.

6) The display of MAX(OPTION)

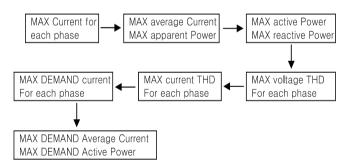


6.1 Measuring DISPLAY MODE & Operation



< PIC 18 The display of MAX >

MAX display mode is displayed in the following order below.



6.2 Setting method

- If pressing [UP], [DOWN] KEY at the same time, it moves to the setting mode or back from it.
- It is available to move and search between setting menus by pressing [UP], [DOWN] KEY.
- If pressing [ENTER] KEY from setting display mode, setting value is blinking and it can be changed.
- If pressing [ENTER] KEY after changing the setting value by [UP],[DOWN] KEY, setting value is turned on and stored.
- If pressing [UP],[DOWN] KEY at the same time after finishing all settings, it turns back to the initial window of measuring display mode.
- ◆ The order and items of setting mode as follows.

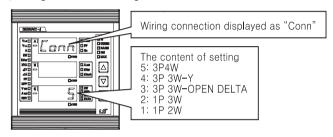
6.2 Setting method

< Table 6 Setting Menu >

Order	Setting Menu	Displayed as	Setting value	Default	Remark
1	Wiring Connection	'Conn'	5 : 3P4W 4 : 3P3W – Y 3 : 3P3W – D 2 : 1P3W 1 : 1P2W	5	
2	PT Ratio	'Pt.'	1.0000~1400.0000	1.0000	
3	CT Ratio	'Ct.'	1~2000 (5A),1~9999 (1A)	1	
4	DEMAND Time	'dE. t'	5~60	15	Step 5
5	Communication Address	'Addr'	1~247	1	
6	Communication Speed	'bPS'	1 : 9600 bps 2 : 19200 bps 3 : 38400 bps	3	
	The swap of float variable	'S'	On: Yes Off: No	On	
7	TX delay time	'tX. t'	10~200 msec	20	
8	Data Reset	'rSt.'	0 : all Data Reset 1 : Wh Reset 2 : Varh Reset 3 : VAh Reset 4 : rWh Reset 5 : rVarh Reset 6 : Demand A Reset 7 : Demand W Reset 8 : Max A Reset 9 : Max W Reset 10 : Max Var Reset 11 : Max VA Reset 12 : Max V THD Reset 13 : Max A THD Reset 14 : Max Demand A Reset 15 : Max Demand W Reset	-	Data from 4 to 15 is ONLY displayed and reset with EX type.
9	Version display	'vEr.'	X.XXX	-	Unavaila ble to set

6.2 Setting method

1) Wiring connection setting



< PIC 19 Wiring connection setting >

- The wiring connection is displayed as "Conn." at upper segment. Press [ENTER] KEY, if there is difference between wiring connection which is set at bottom segment and which will be set.
- Change to the desirable wiring connection by pressing [UP], [DOWN] KEY after checking whether the setting content at bottom segment is blinking to be changed.
- If pressing [ENTER] KEY after setting change, blinking setting content is turned on and stored at non-volatile memory.

2) PT Ratio setting

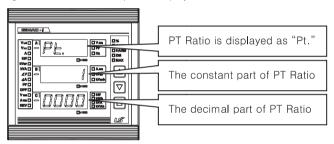
PT Ratio indicates the ratio of PT primary voltage to the secondary voltage and can be input to the forth decimal place for GIMAC-i. For example, if the primary voltage is 22,900V and PT secondary voltage is 110V, PT ratio is 22,900/110 = 208.1818182.

6.2 Setting method

The PT Ratio shall be input as 208.1818 for GIMAC-i.

The amount of difference rounded up or cut away is included in error rate but it does not have any influence on accuracy rate.

The minimum value of PT Ratio is 1.0000 and maximum value of it is 1400.0000. The constant part of PT is displayed at middle segment and the decimal part is displayed at bottom one.

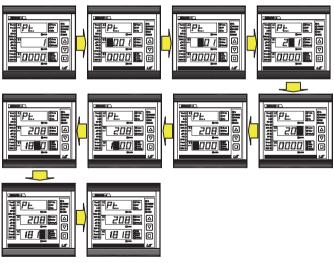


< PIC 20 PT Ratio setting >

- Press [ENTER] KEY if the constant part displayed at middle segment and decimal part displayed at bottom segment are different from PT Ratio which will be set
- ◆ The first value in middle segment is displayed and blinking.
- Change the blinking value to desirable value by pressing [UP], [DOWN] KEY and then press [ENTER] KEY.
- Press [ENTER] KEY after changing the second value which is blinking in middle segment to desirable value by pressing [UP], [DOWN] KEY.
- ◆ If pressing [ENTER] KEY after finishing entering the value to the last

6.2 Setting method

- one at middle segment with the same way above, the first value at bottom segment will be blinking.
- If pressing [ENTER] KEY after entering the value to the last one at bottom segment, the blinking last value is turned on and PT Ratio setting is stored at non-volatile memory and then setting change is finished.



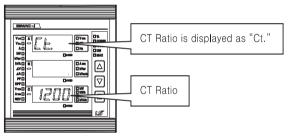
< PIC 21 The example of PT Ratio setting >

6.2 Setting method

3) CT Ratio setting

CT Ratio indicates the ratio of CT primary current to the secondary current. For example, if primary current of CT is 6,000A and secondary current of it is 5A, CT Ratio is 6,000A / 5A = 1,200 and will be input as 1,200 for GIMAC-i.

The minumum value of CT Ratio is 1 and maximum is 2,000(5A) or 9,999(1A)

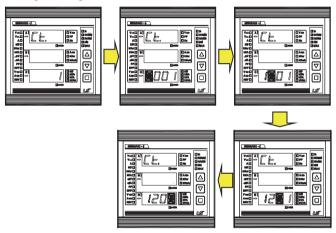


< PIC 22 CT Ratio setting >

- CT Ratio is displayed as "Ct." in upper segment. Press [ENTER] KEY
 if the displayed CT Ratio value in bottom segment is different from
 the one which will be set.
- ◆ The first value at bottom segment is displayed and blinking.
- Press [ENTER] KEY after changing blinking value to desirable one by pressing [UP], [DOWN] KEY.
- Press [ENTER] KEY after changing the second value which is blinking at bottom segment to the desirable value by pressing [UP], [DOWN] KEY.
- ◆ If pressing [ENTER] KEY after finishing entering the value to the last

6.2 Setting method

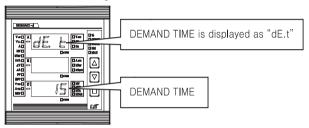
one at bottom segment with the same way above, the last blinking value is turned on, stored at non-volatile memory and CT Ratio setting is changed.



< PIC 23 The example of CT Ratio setting >

6.2 Setting method

4) DEMAND TIME Setting

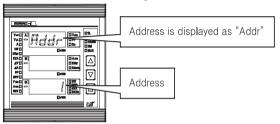


< PIC 24 DEMAND TIME setting >

- Demand time is displayed as "dE. t" at upper segment and press [ENTER] KEY if the demand time which is set at bottom segment is different from the one which will be changed.
- Change demand time to desirable value by pressing [UP], [DOWN]
 KEY after checking whether the setting content at bottom segment is blinking to be changed.
- The minimum value of DEMAND TIME is 5mins and that of maximum is 60mins.
- If pressing [ENTER] KEY after changing setting value, the blinking setting value is turned on and stored at non-volatile memory.

6.2 Setting method

5) Communication Address Setting

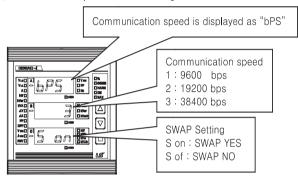


< PIC 25 Communication Address setting >

- The Address is displayed as "Addr." Press [ENTER] KEY if address value which is displayed at bottom segment is different from the value which will be changed.
- Change Address to desirable one by pressing [UP], [DOWN] KEY after checking whether the setting content at bottom segment is blinking to be changed.
- ◆ The minimum value is 1 and the maximum value is 247.
- If pressing [ENTER] KEY after changing setting value, the blinking setting value is turned on and stored at non-volatile memory and Address setting change is finished.

6.2 Setting method

6) Communication speed & SWAP Setting



< PIC 26 Communication speed & SWAP setting >

- The communication speed is displayed as "bPS" in upper segment. Press [ENTER] KEY if communication speed at middle segment is different from the one which will be changed.
- Change to desirable communication speed by pressing [UP], [DOWN] KEY after checking whether the setting content at middle segment is blinking to be changed.
- ◆ The minimum value of communication speed is 9600bps (Setting value: 1) and the maximum value of it is 38400bps (Setting value: 3).

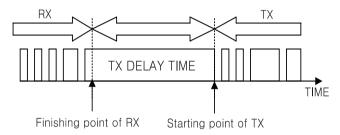
6.2 Setting method

- S displayed at bottom segment indicates whether to swap the float variable or not. If setting SWAP with NO, the data is transmitted in the order of SIGN, EXPONENT and FRACTION from the lowest number of MODBUS FLOAT ADDRESS as specified in IEE754. If setting SWAP with YES, the data is transmitted in the reverse order specified above; changing host word with subordinate word.
- EX) If changing 100.0 into float variable, it is displayed as 0x 42 C8 00 00. SWAP: NO ⇒ Transmitted in the order of 0 x 42 C8 00 00 SWAP: YFS ⇒ Transmitted in the order of 0 x 00 00 42 C8
 - Default value is as follows: Communication speed (38400 bps), SWAP YFS
 - If pressing [ENTER] KEY after changing setting value, the blinking setting value is turned on and stored at non-volatile memory and Communication speed and Swap setting change is finished.

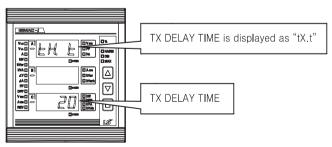
6.2 Setting method

7) TX DELAY Time Setting

TX DELAY TIME means the time interval which takes to transmit the response data after receiving the last data.



The minimum value of TX DELAY TIME is 10msec and the maximum value is 200msec. The real TX DELAY TIME is (Setting time + 3~15msec).

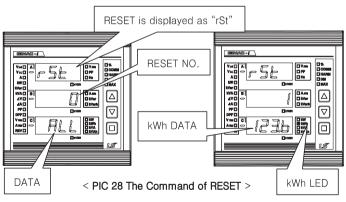


< PIC 27 TX DELAY TIME Setting >

6.2 Setting method

- ◆ TX DELAY TIME is displayed as "tX. t". Press [ENTER] KEY if TX DELAY TIME displayed at bottom segment is different from the TX DELAY TIME which will be changed.
- Change to the desirable TX DELAY TIME by pressing [UP],
 [DOWN] KEY after checking whether the setting content at bottom segment is blinking to be changed.
- If pressing [ENTER] KEY after changing setting value, the blinking setting value is turned on and stored at non-volatile memory and TX DELAY TIME setting change is finished.

8) The command of RESET



RESET Command can be classified according to RESET NO., DATA which will be reset, and corresponding LED.

6.2 Setting method

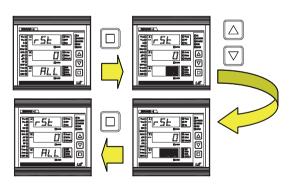
RESET No. as follows:

< Table 7 RESET NO. & Content >

RESET NO.	The content of RESET	Indicating LED	Remark
0	ALL RECORD DATA RESET	-	
1	Active electric energy (Wh) RESET	kWh	
2	Reactive electric energy (Varh) RESET	kVarh	
3	Apparent electric energy (VAh) RESET	kVAh	
4	Reverse active electric energy (rWh) RESET	REV, kWh	OPTION
5	Reverse reactive electric energy (rVarh) RESET	REV, kVarh	OPTION
6	DEMAND A RESET (Each phase DEMAND A & DEMAND A _{AVG} RESET)	DM, A _{AVG} , A (Phase)A,B,C	OPTION
7	DEMAND W RESET	DM, kW	OPTION
8	MAX A RESET (Each phase MAX A & MAX A _{AVG} RESET)	MAX, A _{AVG} , A (Phase)A,B,C	OPTION
9	MAX W RESET	MAX, kW	OPTION
10	MAX Var RESET	MAX, kVar	OPTION
11	MAX VA RESET	MAX, kVA	OPTION
12	MAX V _{THD} RESET	MAX,V _{THD,} V _{L-N,} % (Phase)A,B,C	OPTION
13	MAX A _{THD} RESET	MAX,A _{THD,} A, % (Phase)A,B,C	OPTION
14	MAX DEMAND A RESET (Each phase MAX DEMAND A & MAX DEMAND A _{AVG} RESET)	DM,MAX,A,A _{AVG} (Phase)A,B,C	OPTION
15	MAX DEMAND W RESET	DM, MAX, kW	OPTION

6.2 Setting method

- The example of RESET ALL
- 1. Press [ENTER] KEY after checking whether reset no. is 0 and the content of reset is All.
- 2. The content of reset "ALL" is blinking with displaying "no".
- 3. If pressing [ENTER] KEY after changing the content of reset to "YES" by pressing [UP], [DOWN] KEY, the content of reset is changed to "ALL" and then turned on.
- 4. The data which will be reset is from No.1 through No.15 in above Table 7 RESET NO. & Content
- Press [Up] + [DOWN] KEY at the same time when intend to cancel the reset during reset procedure.



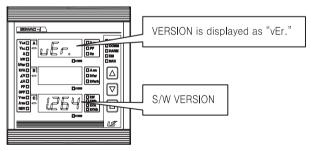
< PIC 29 The example of RESET ALL Command >

6.2 Setting method

♦ The example of Wh RESET

- Press [ENTER] KEY after checking whether reset no. is 1, LED turned on is for kWh, and the content of reset is the kWh data which has been accumulated up to now.
- 2. The content of RESET(Electric energy) is blinking.
- Electric energy is reset to "0.000" if pressing [ENTER] KEY while blinking.
- Press [UP] + [DOWN] KEY at the same time when intend to cancel the reset during reset procedure.

9) The display of program information



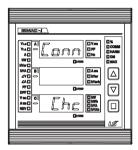
< PIC 30 The display of program information >

It displays the S/W version of GIMAC-i

6.3 The display of wiring connection check & self-diagnostic

1) The check of wiring connection

GIMAC-i displays the message to check wiring connection in case the direction of phase rotation is counterclockwise compared with that of voltage phase (In case of B phase voltage less than C phase).



< PIC 31 The check of Wiring Connection >

The above message has occurred with 3 phase 4 wire and 3 phase 3 wire Y connection and if pressing [ENTER] KEY, the display moves back to measurement window.

In case above message has occurred, check the wiring connection.

6.3 The display of wiring connection check & self-diagnostic

2) The display of self-diagnostic

GIMAC-i displays the self diagnostics as follows.

FRROR 1 : MEMORY FRROR

◆ FRROR 2 : POWER FAIL

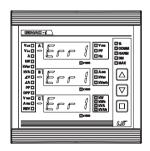
◆ FRROR 3 : OPTION FRROR

FRROR 4: SETTING DATA FRROR

FRROR 5 : CALIBRATION DATA FRROR

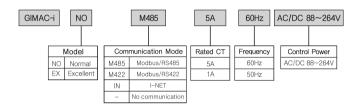
 FRROR 6: PHASE FRROR IN CASE OF CALIBRATION. (Occurring at Manufacturer Mode)

When ERROR has occurred, excluding ERROR 2, contact the nearest service center, agent or sales representatives in your local place for close inspection.



< PIC 32 The display of ERROR >

7. Type designation





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