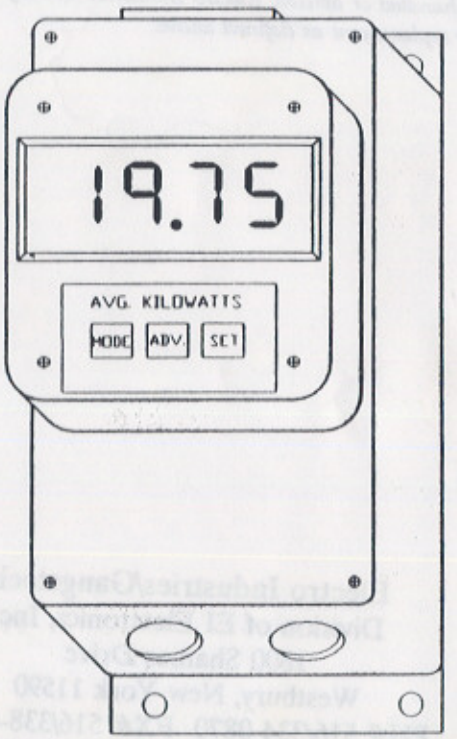
REFERENCE

Electro Industries/Gaugetech

KYZ PULSE ENERGY DEMAND MONITOR & CONTROLLER

REVISION 1.1
5/92

MODEL PVZ101



Tom Vu

NOTES

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Command Protocol:

FUNCTION	COMMAND
Request Average KW Demand	R□□□□D >
Request Maximum Demand	R□□□□X >
Request Minimum Demand	R□□□□N >
Request Data of Last Period	R□□□□L >
Meter's Setup Data	R□□□□S >
Reset Maximum Demand	R□□□□x >
Reset Minimum Demand	R□□□□n >

Example of Response to Command

The response is always of the form of 4 digits:

= 9999

However, the response may or may not contain a decimal point. For example, if the computer polls meter 0001 with the command **R0001D>**, the computer could respond with = **120.0**.

MECHANICAL & ELECTRICAL INSTALLATION

MECHANICAL INSTALLATION

The PVZ101 may be installed in two ways, on surface wiring and below surface wiring. See illustrations on pages 3 and 4.

ELECTRICAL INSTALLATION

Most utilities provide a three wire, S.P.D.T. contact output pulses, which is designated as KYZ. The PVZ101 accepts only a two wire input, either K and Y, or K and Z. See illustration on page 5. It is a dry contact. Polarity would normally not make any difference, except the pulses are being shared with other equipment. In this case polarity needs to be matched according to the indication where pin 1 is positive and pin 2 is negative. Maximum open contact voltage should not exceed 240 V

Recommended wire is a 20 gauge twisted pair, preferably shielded and should not exceed 1000 feet.

POWER SUPPLY

The PVZ101's normal power input is 8 VAC and the instrument is supplied with a U.L. Listed plug in power transformer.

If supplied with normal power supply DO NOT CONNECT 120 VAC POWER DIRECTLY TO THE INSTRUMENT.

If the PVZ101 is purchased with Suffix -S option 120 VAC may be connected directly into power input, and with Suffix -SA option 220 VAC can be connected.

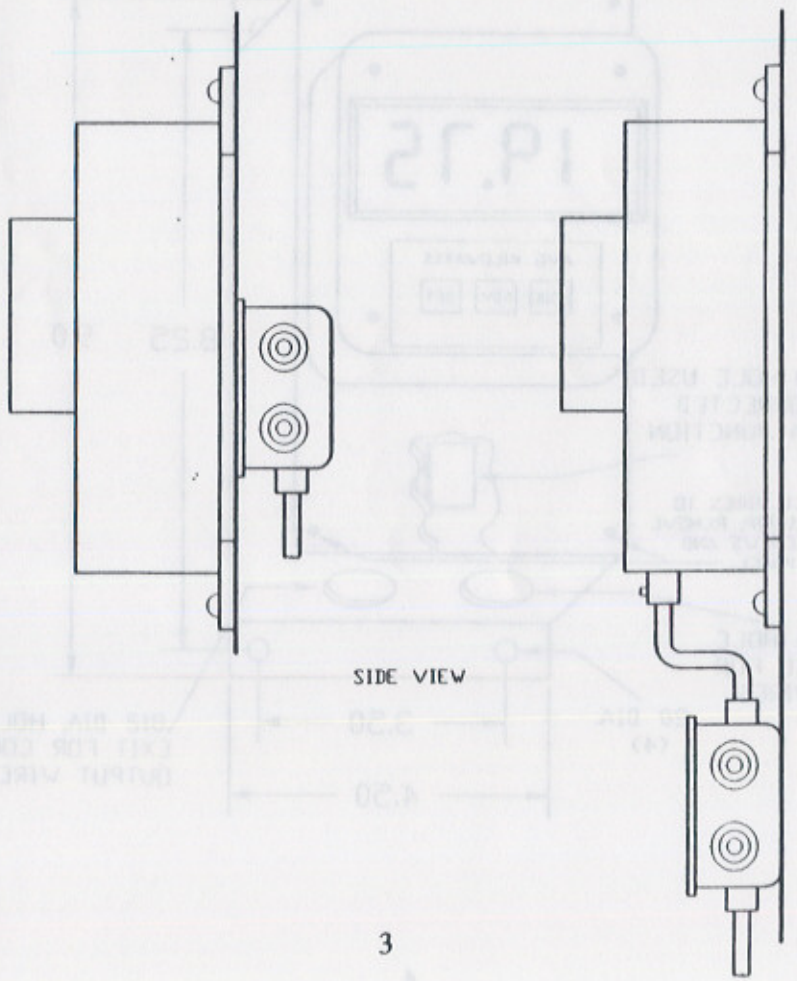
9. Push the <ADV> button to toggle the 4th digit between 0 and 1, this digit is not used for any function so it does not matter what is programmed into it.

P 0000

10. When the 4th digit is reached, push <SET>, this programs into the memory the 4th digit of the display options and completes the programming of the display options. The user can now either exit the programming mode (see EXITING THE PROGRAMMING MODE) or program another function.

P.0000

WALL SURFACE MOUNT INSTALLATION



SIDE VIEW

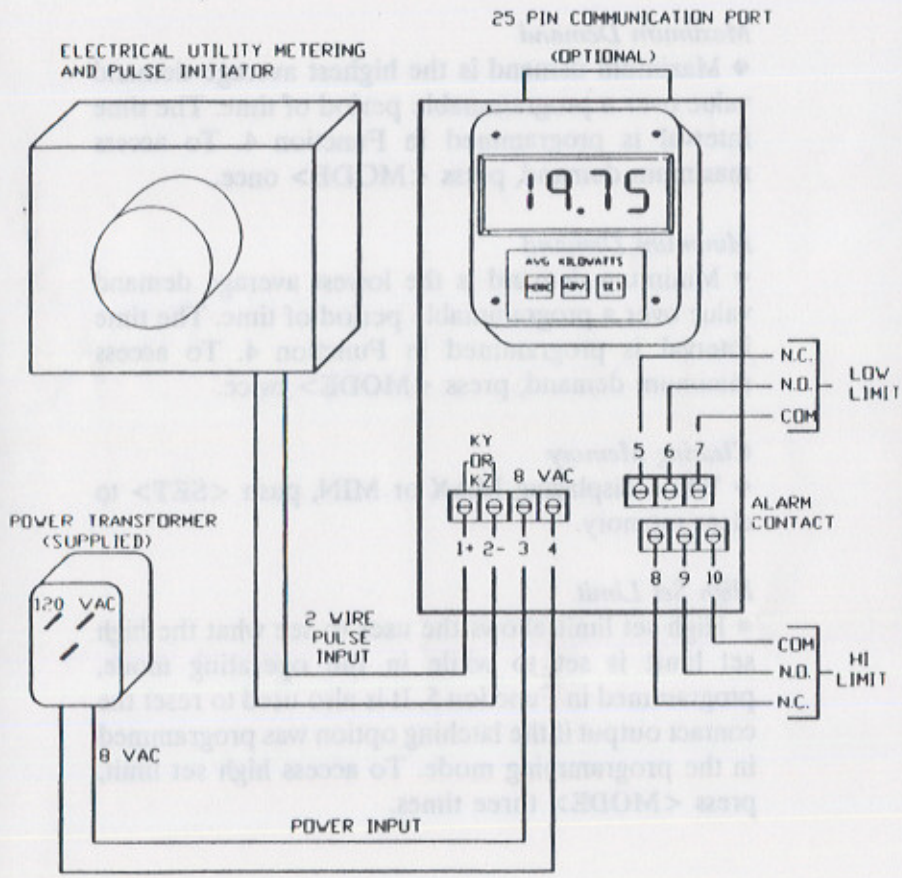
DISPLAY OPTIONS (Function P)

This function is used to set up characteristics of the display. It is used to set up whether the display will indicate Kilowatts or Megawatts and whether or not there will be leading zero blanking.

PROGRAMMING OF THE DISPLAY OPTIONS

PROGRAMMING PROCEDURE	DISPLAY
1. Access the programming mode as described in the section ENTERING THE PROGRAMMING MODE. If the meter is already in the programming mode, push the <MODE> button until function P is displayed.	P. 1100
2. Push the <SET> button to access the 1st digit of the display options.	P -
3. Push the <ADV> button to toggle the digit between 0 (disable leading zero blanking) or 1 (enable leading zero blanking).	P 0

ELECTRICAL INSTALLATION



5. Push the <ADV> button to toggle the 2nd digit between either 0 (disable contact latching) or 1 (enable contact latching).

L 0 0

6. When the 2nd digit is reached, push <SET>, this programs into memory the 2nd digit of the low set limit format and accesses the 3rd digit.

L 0 0 -

7. Push the <ADV> button to toggle the 3rd digit between either 0 (delay time above the limit) or 1 (delay time below the limit).

L 0 0 1

8. When the 3rd is reached, push <SET>, this programs into memory the 3rd digit of the low set limit format and accesses the 4th digit.

L 0 0 1 -

9. Push the <ADV> button to toggle the 4th digit between 0 (enable the display flashing when the limit is exceeded) or 1 (disable the display flashing when the limit is exceeded).

L 0 0 1 0

Low Set Limit

• Low set limit allows the user to see what the low set limit is set to while in the operating mode, programmed in Function 7. It is also used to reset the contact output if the latching option was programmed in the programming mode. To access low set limit, press <**MODE**> four times.

Latch Release (used with relay option)

• While displaying HIGH or LOW, push <**SET**> to release latch.

Disable Display Flashing

• Disable Display Flashing allows the user to stop the display from flashing after the reading has exceeded a set limit. The display will start to flash again if, after the flashing has been disabled, the reading returns to normal and is exceeded again. Push <**ADV**> to stop display flashing when limit is exceeded.

LED Test

• LED Test allows the user to test the LED's. Push <**SET**>, then immediately push <**MODE**>. All the LED's will turn on, then after 5 seconds the instantaneous value will return.

LOW SET LIMIT FORMAT (Function L)

This function is used to program the different characteristics of the low set limit. The characteristics that can be programmed are:

1) if the contact will latch or not
2) if the delay time of the low set limit will be effective above the limit or below the limit
3) if the display will flash or not

The latching of the contact means that once the limit has been exceeded and the contact has changed position it will latch in position and not change until it is manually reset. The delay time above or below the limit means that if it is programmed to be above the limit the contact will change after the delay if the limit has been exceeded. The display flashing simply means that if it is enabled the display will flash when the limit is exceeded.

PROGRAMMING MODE

SHORT FORM FUNCTION AND DESCRIPTION

GENERAL PROGRAMMING

Explains programming mode locations and corresponding functions.

0 - PULSE VALUE: Sets Watt hours per pulse.

1 - MULTIPLICATION FACTOR/CT RATIO: Multiplies pulse value when over 9999, or in some cases, enters CT ratio.

2 - MULTIPLICATION FACTOR/PT RATIO: Multiplies pulse value when over 9999, or in some cases, enters PT ratio.

3 - FULL SCALE RANGE: Sets decimal point.

4 - INTERVAL: Sets the period of time for which the average Kwatt hours, Max/Min Demand is averaged.

5 - HIGH SET LIMIT: Sets high limit at which contact changes position.

6 - HIGH SET LIMIT DELAY TIME: Sets the time delay after which high set limit contact will change position.

7 - LOW SET LIMIT: Sets low limit at which contact changes position.

8 - LOW SET LIMIT DELAY TIME: Sets the time delay after which low set limit contact will change position.

9 - METER ADDRESS FOR COMMUNICATIONS: (Optional) Sets meter address.

H - HIGH SET LIMIT FORMAT: Sets characteristics of the high set limit.

2. Push the <SET> button to access the 1st digit of the high set limit format.	H -
3. Push the <ADV> button to toggle the digit between 0 and 1, this digit is not used for any functions so it does not matter what is programmed into it.	H 0
4. Push the <SET> button to program either a 0 or 1 into the 1st digit and access the 2nd digit.	H 0 -
5. Push the <ADV> button to toggle the 2nd digit between either 0 (disable contact latching) or 1 (enable contact latching).	H 0 0
6. When the 2nd digit is reached, push <SET>, this programs into memory the 2nd digit of the high set limit format and accesses the 3rd digit.	H 0 0 -
7. Push the <ADV> button to toggle the 3rd digit between either 0 (delay time above the limit) or 1 (delay time below the limit).	H 0 0 0

PROGRAMMING MODE

ENTERING THE PROGRAMMING MODE

PROGRAMMING PROCEDURE	DISPLAY
1. Momentarily push the <SET> button.	PPPP
2. IMMEDIATELY push the <ADV> button. Allow the leftmost function digit to cycle through numbers 0-5.	0
3. As soon as the function displays 5, push the <SET> button. This will set the 5 in the first digit position and the function digit will again cycle through 0-5.	55
Repeat the above procedure until there are four 5's on the display. The meter will now access the programming mode.	55555
If the <SET> button was not pushed at the correct time, the numbers will continue to cycle through until 9 and then the meter will exit to the operating mode.	

PROGRAMMING NOTE FOR FUNCTIONS H, L, AND P

Only 0 or 1 can be entered in functions H, L, and P. Each digit represents an electronic switch, either enabling or disabling a feature, or selecting between two different features with 0 or 1.

PROGRAMMING MODE

PULSE VALUE (Function 0)

The pulse value is the amount of watthours per pulse (WH/PULSE). This value is usually calculated by the utility company in form C (KYZ). The PVZ101 uses form A two wire, therefore the form C value needs to be multiplied by 2 to ensure correct readings. The utility company calculates pulse value by: multiplying the K_h (WH/REVOLUTION) of the watthour meter by the M_p (REVOLUTIONS/PULSE) of the pulse initiator (see example 1). In some cases the K_e (KWH/PULSE) of the pulse initiator is available to the user, when such a case exists the user can determine the pulse value by multiplying the K_e (KWH/PULSE) BY 1000 (see example 2).

Example 1: K_h = 7.2 WH/REV.
M_p = 4 REV./PULSE
7.2 * 4 = 28.8 WH/PULSE
Enter into the meter as the pulse value, 028.8.

Example 2: K_e = .0288 KWH/PULSE
.0288 * 1000 = 28.8 WH/PULSE
Enter into the meter as the pulse value, 028.8.

The Pulse Value is entered in watthours with a range from 0.001 to 9999 without using a multiplication factor. When range exceeds 9999, a multiplying constant may be used in Functions 1 or 2. This is accomplished by dividing the pulse value by a constant number (for example - 1000) then entering the resulting number in Function 0 and the constant

4. When the 1st digit is reached, push <SET>, this programs into memory the 1st digit of the meter address and accesses the 2nd digit.

9 0-

5. Push the <ADV> button until the 2nd digit of the meter addresss is reached.

9 00

6. When the 2nd digit is reached, push <SET>, this programs into memory the 2nd digit if the meter address and accesses the 3rd digit.

9 00-

7. Push the <ADV> button until the 3rd digit of the meter address is reached.

9 001

8. When the 3rd digit is reached, push <SET>, this programs into memory the 3rd digit of the meter address and accesses the 4th digit.

9 001-

9. Push the <ADV> button until the 4th digit of the meter address is reached.

9 0015

4. When the decimal point is in the desired position push the <SET> button to program the decimal point position into memory and access the 1st digit of the pulse value.

• -

5. Push the <ADV> button until the 1st digit of the pulse value is reached.

• 0 .

6. When the 1st digit is reached, push <SET>, this programs into memory the 1st digit of the pulse value and accesses the 2nd digit.

• 0 - .

7. Push the <ADV> button until the 2nd digit of the pulse value is reached.

• 02 .

8. When the 2nd digit is reached, push <SET>, this programs into memory the 2nd digit of the pulse value and accesses the 3rd digit.

• 02-.

9. Push the <ADV> button until the 3rd digit of the pulse value is reached.

• 028.

10. When the 4th digit is reached, push <SET>, this programs into memory the 4th digit of the low set limit delay time. The user can now either exit the programming mode (see EXITING THE PROGRAMMING MODE) or program another function.

8.0060

MULTIPLICATION FACTOR/CT RATIO (Function 1)

Enter 0001 unless one of the following situations apply. Primarily this function is used for the multiplication factor when the pulse value exceeds 9999 (see Pulse Value Function 0).

In rare cases the utility company will give the pulse value corresponding to the secondary of the PT and CT ratios, in which case the CT ratio can be entered here. The CT ratio is a ratio between the primary to secondary of a current transformer. Most CT values are expressed as a ratio of a primary current to a secondary current of 5 amps. If this is true for the CT used in the user's application then the ratio must be expressed as a ratio of a primary current to a secondary current of 1 amp.

Example 1: If a CT with the rating of 2000/5 is being used then the ratio to be entered into the meter is 400 since the ratio can also be expressed as 400/1.

LOW SET LIMIT DELAY TIME (Function 8)

The low set limit delay time is the time, in seconds, in which the low set limit contact will change after the limit has been exceeded. This means that if the delay is set for 5 seconds the contact will change 5 seconds after the limit is exceeded and sustained. The reading must exceed the limit for the duration of the delay or the contact will not change. If instant relay reaction is preferred program 0000.

PROGRAMMING OF THE LOW SET LIMIT DELAY TIME

PROGRAMMING PROCEDURE	DISPLAY
1. Access the programming mode as described in the section ENTERING THE PROGRAMMING MODE. If the meter is already in the programming mode, push the <MODE> button until function 8 is displayed.	8. 0 1 0 0
2. Push the <SET> button to access the 1st digit of the low set limit delay time.	8 -
3. Push the <ADV> button until the 1st digit of the low set limit delay time is reached.	8 0

6. When the 2nd digit is reached, push <SET>, this programs into memory the 2nd digit and accesses the 3rd digit.	1 0 0 -
7. Push the <ADV> button until the 3rd digit reached.	1 0 0 0
8. When the 3rd digit is reached, push <SET>, this programs into memory the 3rd digit and accesses the 4th digit.	1 0 0 0 -
9. Push the <ADV> button until the 4th digit is reached.	1 0 0 0 1
10. When the 4th digit is reached, push <SET>, this programs into memory the 4th digit of the Multiplication Factor/CT ratio and completes the programming of the Multiplication Factor/CT ratio. The user can now either exit the programming mode (see EXITING THE PROGRAMMING MODE) or program another function.	1. 0 0 0 1

5. Push the <ADV> button until the 2nd digit of the low set limit is reached.	7 0 1
6. When the 2nd digit is reached, push <SET>, this programs into memory the 2nd digit of the low set limit and accesses the 3rd digit.	7 0 1 -
7. Push the <ADV> button until the 3rd digit of the low set limit is reached.	7 0 1 4
8. When the 3rd digit is reached, push <SET>, this programs into memory the 3rd digit of the low set limit and accesses the 4th digit.	7 0 1 4 -
9. Push the <ADV> button until the 4th digit of the low set limit is reached.	7 0 1 4 4

PROGRAMMING THE MULTIPLICATION FACTOR/PT RATIO

PROGRAMMING PROCEDURE	DISPLAY
1. Access the programming mode as described in the section ENTERING THE PROGRAMMING MODE. If the meter is already in the programming mode, push the <MODE> button until function 2 is displayed.	2. 0 0 0 1
2. Push the <SET> button to access the 1st digit of the Multiplication Factor/PT ratio.	2 -
3. Push the <ADV> button until the 1st digit is reached.	2 0
4. When the 1st digit is reached, push <SET>, this programs into memory the 1st digit and accesses the 2nd digit.	2 0 -
5. Push the <ADV> button until the 2nd digit is reached.	2 0 0

10. When the 4th digit is reached, push <SET>, this programs into memory the 4th digit of the high set limit delay time and completes the programming of the high set limit delay time. The user can now either exit the programming mode (see EXITING THE PROGRAMMING MODE) or program another function.

6.0060

FULL SCALE RANGE (Function 3)

The full scale range function is actually just programming in the location of the decimal point of the full scale which allows the user to select the best display range to suit his application.

To obtain the correct location of the decimal point to fit a particular application, the user must estimate the approximate maximum demand of the system (see example) and adjust the scale from there. If after the approximate maximum demand has been determined and the decimal point has been programmed and the meter still overranges, move the decimal point to the right. To improve resolution move the decimal point to the left.

Examples:

If the estimated maximum demand of a system is approximately 6 kilowatts then the decimal point would be put in the leftmost position and the display range would be from 0.000 kilowatts to 9.999 kilowatts.

If the estimated maximum demand of a system is approximately 60 kilowatts then the decimal point would be put in the second position and the display range would be from 00.00 kilowatts to 99.99 kilowatts.

If the estimated maximum demand of a system is approximately 600 kilowatts then the decimal point would be put in the third positions and the display range would be from 000.0 kilowatts to 999.9 kilowatts.

If the estimated maximum demand of a system is approximately 6000 kilowatts (or 6.000 megawatts) then the decimal point would be put in the rightmost position and the display range would be from 0000 kilowatts to (0.000 megawatts)

HIGH SET LIMIT DELAY TIME (Function 6)

The high set limit delay time is the time, in seconds, in which the high set limit contact will change after the limit has been exceeded. This means that if the delay is set for 5 seconds the contact will change 5 seconds after the limit is exceeded and sustained. The reading must exceed the limit for the duration of the delay or the contact will not change. Program 0000 if instant relay reaction is preferred.

PROGRAMMING OF THE HIGH SET LIMIT DELAY TIME

PROGRAMMING PROCEDURE	DISPLAY
1. Access the programming mode as described in the section ENTERING THE PROGRAMMING MODE. If the meter is already in the programming mode, push the <MODE> button until function 6 is displayed.	6.0100
2. Push the <SET> button to access the 1st digit of the high set limit delay time.	6 -
3. Push the <ADV> button until the 1st digit of the high set limit delay time is reached.	6 0

4. When the decimal point is in the desired position, push the <SET> button, this programs into memory the decimal point position and completes the programming of the full scale range. The user can now either exit the programming mode (see EXITING THE PROGRAMMING MODE) or program another function.	3.9999.

HIGH SET LIMIT (Function 5)

Tne high set limit is the number at which the high set limit contact will change position and display will flash if enabled in Functions H .

PROGRAMMING OF THE INTERVAL

PROGRAMMING PROCEDURE	DISPLAY
1. Access the programming mode as described in the section ENTERING THE PROGRAMMING MODE. If the meter is already in the programming mode, push the <MODE> button until function 5 is displayed.	5. 0 5 7 6
2. Push the <SET> button to access the 1st digit of the high set limit.	5 -
3. Push the <ADV> button until the 1st digit of the high set limit is reached.	5 0
4. When the 1st digit is reached, push <SET>, this programs into memory the 1st digit of the high set limit and accesses the 2nd digit.	5 0 -.

4. When the 1st digit is reached, push the <SET> button, this programs into memory the 1st digit of the interval and accesses the 2nd digit.	4 0 -
5. Push the <ADV> button until the 2nd digit of the interval is reached.	4 0 9
6. When the 2nd digit is reached, push <SET>, this programs into memory the 2nd digit of the interval and accesses the 3rd digit.	4 0 9 -
7. Push the <ADV> button until the 3rd digit of the interval is reached.	4 0 9 0
8. When the 3rd digit is reached, push <SET>, this programs into memory the 3rd digit of the interval and accesses the 4th digit.	4 0 9 0 -
9. Push the <ADV> button until the 4th digit of the interval is reached.	4 0 9 0 0

10. When the 4th digit is reached, push <SET>, this programs into memory the 4th digit of the interval and completes the programming of the interval. The user can now either exit the programming mode (see EXITING THE PROGRAMMING MODE) or program another function.

4.0900

SUMMARY OF RELAY FUNCTIONS

The contact relay includes a variety programmable functions, consisting of two relays, one for high set limits (Function 5) and one for low set limits (Function 7). Both of these can be dedicated to trip an alarm. Listed below are the different ways the relay option can be used. Actual programming instructions are described in the corresponding function sections of this manual.

- Delay time for high and low set limits (Functions 6 and 8): defines the time it will take the contacts to change position once the reading either falls below or exceeds the limits.

- Program time delay (Function H and L): Each limit can be programmed for delay time to be effective above or below limit.

- Contact latching (Functions H and L): when limit is exceeded, defines whether or not contact will remain stationary until manually reset.

- Display flashing (Functions H and L): controls whether the display will flash when the limit is exceeded.

INTERVAL (Function 4)

The interval is the period of time, entered in seconds, that the input is averaged to obtain the average kilowatt, maximum and minimum demand readings.

Note -- The interval is entered in seconds.

Example: 15 min. = 900 sec.

PROGRAMMING OF THE INTERVAL

PROGRAMMING PROCEDURE	DISPLAY
1. Access the programming mode as described in the section ENTERING THE PROGRAMMING MODE. If the meter is already in the programming mode, push the <MODE> button until function 4 is displayed.	4. 0 0 2 0
2. Push the <SET> button to access the 1st digit of the interval.	4 -
3. Push the <ADV> button until the 1st digit of the interval is reached.	4 0

5. Push the <ADV> button until the 2nd digit of the high set limit is reached.	5 0 2.
6. When the 2nd digit is reached, push <SET>, this programs into memory the 2nd digit and accesses the 3rd digit.	5 0 2.-
7. Push the <ADV> button until the 3rd digit is reached.	5 0 2.8
8. When the 3rd digit is reached, push <SET>, this programs into memory the 3rd digit and accesses the 4th digit.	5 0 2.8 -
9. Push the <ADV> button until the 4th digit is reached.	5 0 2.8 8
10. When the 4th digit is reached, push <SET>, this programs into memory the 4th digit of programming of the high set limit and completes the programming of the high set limit. The user can now either exit the programming mode or (see EXITING THE PROGRAMMING MODE) or program another function.	5. 0 2.8 8

to 9999 kilowatts (9.999 megawatts).

NOTE -- The preceding examples also hold true for megawatt readings.

PROGRAMMING OF THE FULL SCALE RANGE

PROGRAMMING PROCEDURE	DISPLAY
1. Access the programming mode as described in the section ENTERING THE PROGRAMMING MODE. If the meter is already in the programming mode, push the <MODE> button until function 3 is displayed.	3. 9 9.9 9
2. Push the <SET> button to access the decimal point of the full scale range.	3 9.9 9 9
3. Push the <ADV> button until the decimal point is in the correct location.	3 9 9 9 9.

4. When the 1st digit is reached, push <SET>, this programs into memory the 1st digit of the high set limit delay time and accesses the 2nd digit.	6 0-
5. Push the <ADV> button until the 2nd digit of the high set limit delay time is reached.	6 00
6. When the 2nd digit is reached, push <SET>, this programs into memory the 2nd digit of the high set limit delay time and accesses the 3rd digit.	6 00-
7. Push the <ADV> button until the 3rd digit of the high set limit delay time is reached.	6 006
8. When the 3rd digit is reached, push <SET>, this programs into memory the 3rd digit of the high set limit delay time and accesses the 4th digit.	6 006-
9. Push the <ADV> button until the 4th digit of the high set limit delay time is reached.	60060

6. When the 2nd digit is reached, push <SET>, this programs into memory the 2nd digit and accesses the 3rd digit.	2 00-
7. Push the <ADV> button until the 3rd digit is reached.	2 000
8. When the 3rd digit is reached, push <SET>, this programs into memory the 3rd digit and accesses the 4th digit.	2 000-
9. Push the <ADV> button until the 4th digit is reached.	2 0001
10. When the 4th digit is reached, push <SET>, this programs into memory the 4th digit of the Multiplication Factor/PT ratio and completes the programming of the Multiplication Factor/PT ratio. The user can now either exit the programming mode (see EXITING THE PROGRAMMING MODE) or program another function.	2. 0001

LOW SET LIMIT (Function 7)

The low set limit is the number at which the low set limit contact will change position and display will flash if enabled in Functions L.

PROGRAMMING OF THE LOW SET LIMIT

PROGRAMMING PROCEDURE	DISPLAY
1. Access the programming mode as described in the section ENTERING THE PROGRAMMING MODE. If the meter is already in the programming mode, push the <MODE> button until function 7 is displayed.	7. 0288
2. Push the <SET> button to access the 1st digit of the low set limit.	7 -
3. Push the <ADV> button until the 1st digit of the low set limit is reached.	7 0
4. When the 1st digit is reached, push <SET>, this programs into memory the 1st digit of the low set limit and accesses the 2nd digit.	7 0-

MULTIPLICATION FACTOR/PT RATIO
(Function 2)

Enter 0001 unless one of the following situations apply. If you have already entered a multiplication factor in function 1, there is no need to duplicate it. Enter 0001. Primarily this function is used for the multiplication factor when the pulse value exceeds 9999 (see Pulse Value Function 0).

In rare cases the utility company will give the pulse value corresponding to the secondary of the PT and CT ratios, in which case the PT ratio can be entered here. The PT ratio is a ratio between the primary to secondary of a potential transformer. Most PT values are expressed as a ratio of a primary voltage to a secondary voltage of 120 VAC. If this is true for the PT used in the user's application then the ratio must be expressed as a ratio of a primary voltage to a secondary voltage of 1 volt.

Example 1: If a PT is being used with a ratio of 14400/120 then the PT ratio which is entered into the meter is 120 because the ratio 14400/120 can also be expressed as 120/1.

10. When the 4th digit is reached, push <SET>, this programs into memory the 4th digit of the low set limit and completes the programming of the low set limit. The user can now either exit the programming mode (see EXITING THE PROGRAMMING MODE) or program another function.

7.0144

PROGRAMMING THE MULTIPLICATION FACTOR/CT RATIO

PROGRAMMING PROCEDURE	DISPLAY
1. Access the programming mode as described in the section ENTERING THE PROGRAMMING MODE. If the meter is already in the programming mode, push the <MODE> button until function 1 is displayed.	1.0001
2. Push the <SET> button to access the 1st digit of the Multiplication Factor/CT ratio.	1 -
3. Push the <ADV> button until the 1st digit is reached.	1 0
4. When the 1st digit is reached, push <SET>, this programs into memory the 1st digit and accesses the 2nd digit.	1 0 -
5. Push the <ADV> button until the 2nd digit is reached.	1 0 0

4. When the 1st digit is reached, push <SET>, this programs into memory the 1st digit of the low set limit delay time and accesses the 2nd digit.	8 0 -
5. Push the <ADV> button until the 2nd digit of the low set limit delay time is reached.	8 0 0
6. When the 2nd digit is reached, push <SET>, this programs into memory the 2nd digit of the low set limit delay time and accesses the 3rd digit.	8 0 0 -
7. Push the <ADV> until the 3rd digit of the low set limit delay time is reached.	8 0 0 6
8. When the 3rd digit is reached, push <SET>, this programs into memory the 3rd digit of the low set limit delay time and accesses the 4th digit.	8 0 0 6 -
9. Push the <ADV> button until the 4th digit of the low set limit delay time is reached.	8 0 0 6 0

10. When the 3rd digit is reached, push <SET>, this programs into memory the 3rd digit of the pulse value and accesses the 4th digit.	0 0 2 8.-
11. Push the <ADV> button until the 4th digit of the pulse value is reached.	0 0 2 8.8
12. When the 4th digit is reached, push <SET>, this programs into memory the 4th digit of the pulse value and completes the programming of the pulse value. The user can now either exit the programming mode (see EXITING THE PROGRAMMING MODE) or program another function.	0. 0 2 8.8

METER ADDRESS FOR COMMUNICATIONS (Function 9)

This function is only accessible if the communications output option was ordered. This function is used to program the four digit meter address used when the meter is to interface with a computer. Baud rate is 1200 with a communications format of one start bit, 8 data bits, no parity and one stop bit.

PROGRAMMING OF THE METER ADDRESS FOR COMMUNICATIONS

PROGRAMMING PROCEDURE	DISPLAY
1. Access the programming mode as described in the section ENTERING THE PROGRAMMING MODE. If the meter is already in the programming mode, push the <MODE> button until function 9 is displayed.	9. 0 0 1 0
2. Push the <SET> button to access the 1st digit of the meter address.	9 -
3. Push the <ADV> button until the 1st digit of the meter address is reached.	9 0

in Function 1 or 2. See example 1.

Example 1: If Pulse Value = 10,000
If Constant = 1000
10,000 ÷ 1000 = 10
Then enter 0010 in Pulse Value (Function 0) and 1000 in Multiplication Factor (Functions 1 or 2).

PROGRAMMING OF THE PULSE VALUE

PROGRAMMING PROCEDURE	DISPLAY
1. Access the programming mode as described in the section ENTERING THE PROGRAMMING MODE. If the meter is already in the programming mode, push the <MODE> button until function 0 is displayed.	0.096.0
2. Push the <SET> button to access the decimal point of the pulse value.	0 .
3. Push the <ADV> button until the decimal point is in the correct position.	0 .

10. When the 4th digit is reached, push <SET>, this programs into memory the 4th digit of the meter address and completes the programming of the meter address. The user can now either exit the programming mode (see EXITING THE PROGRAMMING MODE) or program another function.	9.0015

EXITING THE PROGRAMMING MODE

PROGRAMMING PROCEDURE	DISPLAY
1. Push the <MODE> button until the function E is displayed.	E.
2. Push the <ADV> button until the decimal point next to the E disappears. The meter will automatically go into the operating mode.	E.

HIGH SET LIMIT FORMAT (Function H)

This function is used to program the different characteristics of the high set limit. The characteristics that can be programmed are:

1) if the contact will latch or not
2) if the delay time of the high set limit will be effective above the limit or below the limit
3) if the display will flash or not

The latching of the contact means that once the limit has been exceeded and the contact has changed position it will latch in position and not change until it is manually reset. The delay time above or below the limit means that if it is programmed to be above the limit the contact will change after the delay if the limit has been exceeded. The display flashing simply means that if it is enabled the display will flash when the limit is exceeded.

PROGRAMMING OF THE HIGH SET LIMIT FORMAT

PROGRAMMING PROCEDURE	< M O D E > button until function H is displayed.
1. Access the programming mode as described in the section ENTERING THE PROGRAMMING MODE. If the meter is already in the programming mode, push the	DISPLAY H. 0 1 0 1

L - LOW SET LIMIT FORMAT: Sets characteristics of the low set limit.

P - DISPLAY OPTIONS: Selects leading 0 blanking and displays Kwatt or Mwatt.

8. When the 3rd is reached, push <SET>, this programs into memory the 3rd digit of the high set limit format and accesses the 4th digit.

H 000-

9. Push the <ADV> button to toggle the 4th digit between 0 (enable the display flashing when the limit is exceeded) or 1 (disable the display flashing when the limit is exceeded).

H 0000

10. When the 4th digit is reached, push <SET>, this programs into the memory the 4th digit of the high set limit format and completes the programming of the high set limit format. The user can now either exit the programming mode (see EXITING THE PROGRAMMING MODE) or program another function.

H.0000

PROGRAMMING

INTRODUCTION

Since site requirements vary widely, meters must be able to handle a wide range of full scale settings, set limits and other parameters. With this in mind, the PVZ101 monitor was designed to be fully programmable, allowing the user to custom-fit the meter to any site requirement.

Through the programming mode, all of the above parameters can be selected and stored permanently. If pulse value, intervals and limits are specified they will be pre-set at the factory, eliminating the need for on-site programming. If not, the Programming Mode makes it possible for the site manager or other qualified personnel to make the necessary adjustments.

SECURITY

To enter the Programming Mode, a password is required. This security feature prevents unauthorized changes to critical meter settings and insures safe, accurate power metering.

PROGRAMMING OF THE LOW SET LIMIT FORMAT

PROGRAMMING PROCEDURE	DISPLAY
1. Access the programming mode as described in the section ENTERING THE PROGRAMMING MODE. If the meter is already in the programming mode, push the <MODE> button until function L is displayed.	L 0 1 0 1
2. Push the <SET> button to access the 1st digit of the low set limit format.	L -
3. Push the <ADV> button to toggle the digit between 0 and 1, this digit is not used for any functions so it does not matter what is programmed into it.	L 0
4. Push the <SET> button to program either a 0 or 1 into the 1st digit and access the 2nd digit.	L 0 -

OPERATING MODE

The meter will normally display average demand values.

Maximum Demand

- Maximum demand is the highest average demand value over a programmable period of time. The time interval is programmed in Function 4. To access maximum demand, press <MODE> once.

Minimum Demand

- Minimum demand is the lowest average demand value over a programmable period of time. The time interval is programmed in Function 4. To access minimum demand, press <**MODE**> twice.

Clearing Memory

- While displaying MAX or MIN, push <SET> to clear memory.

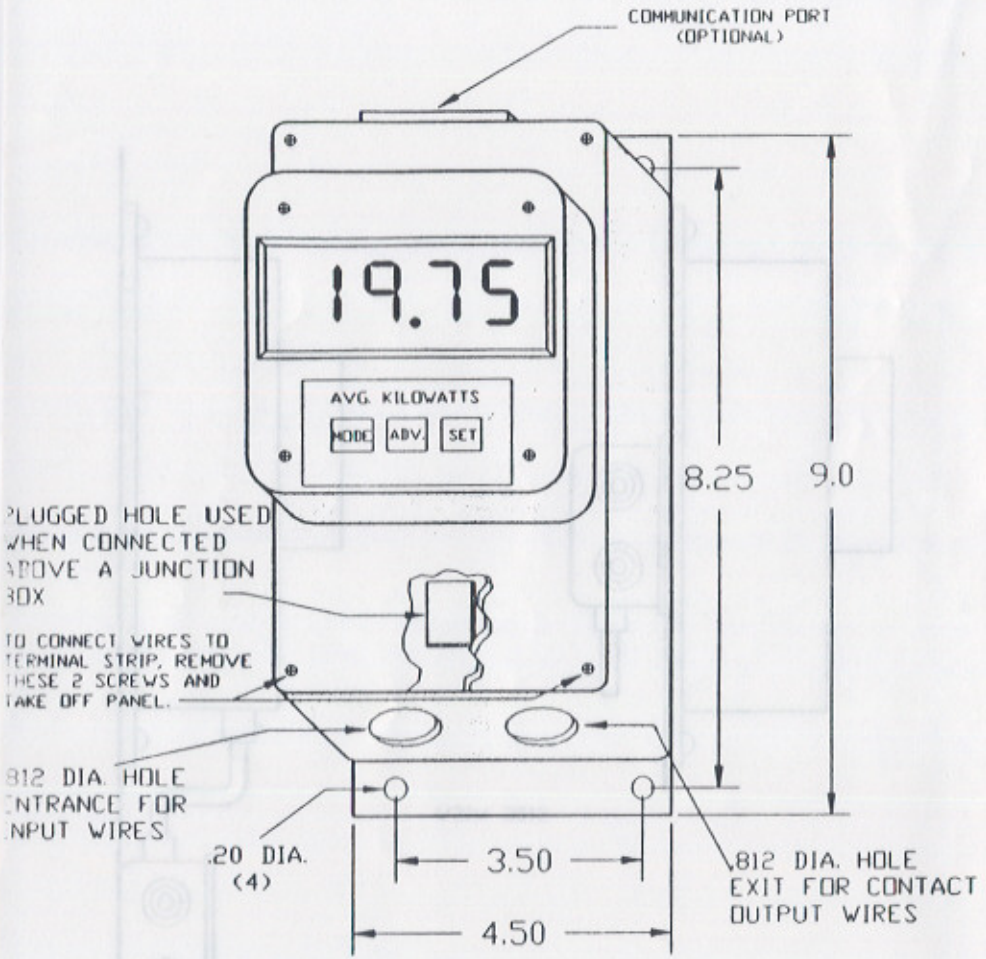
High Set Limit

- High set limit allows the user to see what the high set limit is set to while in the operating mode, programmed in Function 5. It is also used to reset the contact output if the latching option was programmed in the programming mode. To access high set limit, press <**MODE**> three times.

10. When the 4th digit is reached, push <SET>, this programs into the memory the 4th digit of the low set limit format and completes the programming of the low set limit format. The user can now either exit the programming mode (see EXITING THE PROGRAMMING MODE) or program another function.

L.0010

MECHANICAL INSTALLATION
PVZ101
ENCLOSURE DIMENSIONS



4. When the 1st digit is reached, push <SET>, this programs into memory the 1st digit of the display options and accesses the 2nd digit. **P 0-**

5. Push the <ADV> button to toggle the 2nd digit between either 0 (display kilowatt) or 1 (display megawatt). **P 0 0**

6. When the 2nd digit is reached, push <SET>, this programs into memory the 2nd digit of the display options and accesses the 3rd digit. **P 0 0-**

7. Push the <ADV> button to toggle the 3rd digit between either 0 and 1, this digit is not used for any function so it does not matter what is programmed into it. **P 0 0 0**

8. When the 3rd digit is reached, push <SET>, this programs into memory the 3rd digit of the display option and accesses the 4th digit. **P 0 0 0-**

RELAY HOOKUP

Electrical installation diagram page 5, shows position of relay before activating. Maximum contact rating of relay is 10 A and 120 VAC. It is not recommended to use relay for more than 24 VAC, because the instruments basic design is for low voltage applications.

COMMUNICATIONS FORMAT
(Optional)

Electro Industries/Gaugetech's PVZ series of demand monitors is available with an EIA RS232C communications port and RM2 software package, each separate options. Using RM2, data is easily available at a computer terminal. See RM2 software for complete instructions.

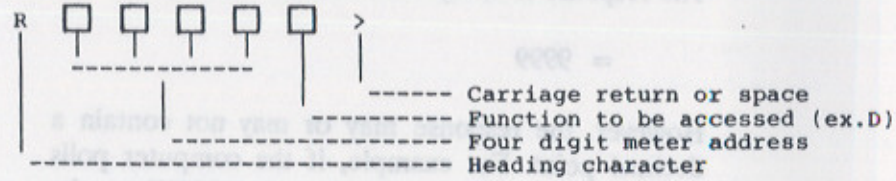
Note -- Baud rate is set at 1200 and is not programmable.

The 25 pin female connector is configured as a DCE (data communications equipment) type which allows a direct connection to a standard computer serial port using a standard cable.

Communication Format:

One start bit, 8 data bits, no parity, one stop bit and a baud rate of 1200.

Command Designations:



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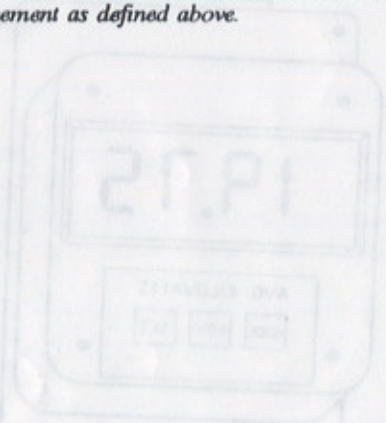
NOTES

STATEMENT OF WARRANTY

Electro Industries takes many steps to assure reliable performance of its products. All products manufactured by Electro Industries/Gaugetech are warranted against defects in material and workmanship for a period of one full year from the date of delivery. Electro Industries/Gaugetech will correct or replace, at no cost, any defect or defective material, returned freight pre-paid, that occurs under proper use and normal operation. There will be no charge for this repair provided that there is no evidence that the equipment has been mishandled or abused. Electro Industries' liability is limited to repair or replacement as defined above.



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