

FUTEK

ADVANCED SENSOR TECHNOLOGY



IPM525 (Old Model# D525) OPERATOR'S MANUAL



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SECTION 1

INTRODUCTION AND DESCRIPTION

SECTION 1.1: UNIT DESCRIPTION:

The single input IPM525 intelligent process meters features 5 ½ digit resolution, 6 digit display, 5 front key operation and a NEMA 4X, industrialized aluminum case. One Form A relay is provided standard for use as an Alarm output. The IPM525 emphasizes the features required in today's applications, especially scaling of the meter to display in engineering units. Two methods are provided to scale the meter: No calculation scale and offset, and load calibration.

Models:

IPM525 – 4 analog inputs with 5th channel math

Features:

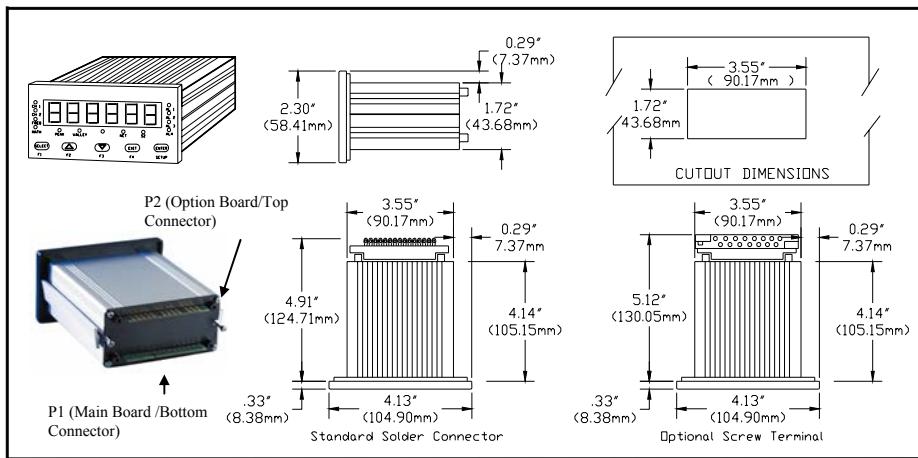
"C"	3 Form C Relays
"H"	4 Individual Analog Outputs & Excitation Output
"P"	Excitation Supplies 10VDC and 24VDC
"T"	Serial RS-232C Communication
"U"	RS485 Communication (available soon)
"F"	Factory Scaling (optional)

Inputs:

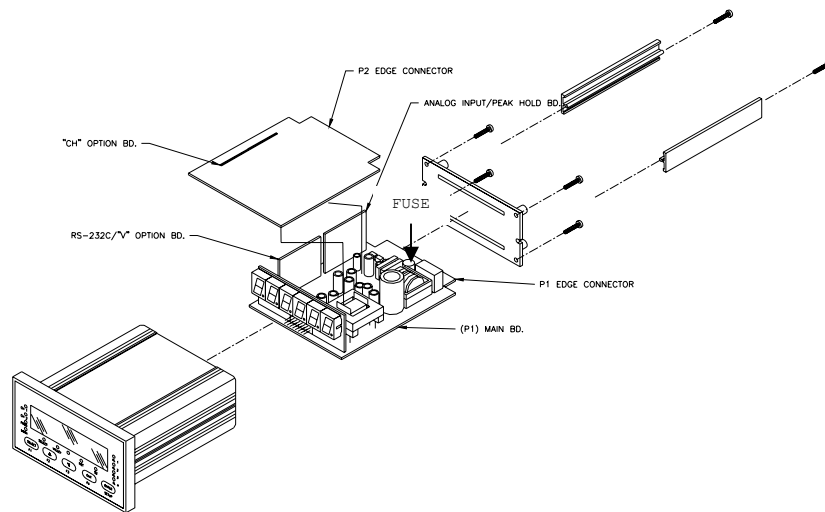
Process inputs selectable for 20mA, 30mV, 100mV, 200mV, 2V, +10V input

The setup of the meter is fully programmed through the front panel keypads. The 115VAC or 220VAC selection is accomplished through the selection of an internal jumper connection.

SECTION 1.2: DIMENSIONAL DRAWINGS



SECTION 1.3



SECTION 2

SECTION 2.0 SAFETY SUMMARY

All safety related regulations, local codes and instructions that appear in this literature or on equipment must be observed to ensure personal safety and to prevent damage to either the instrument or equipment connected to it. If equipment is used in a manner not specified by the manufacture, the protection provided by the equipment may be impaired.

Do not use this unit directly command motors, valves, or other actuators not equipped with safeguards. To do so can be potentially harmful to persons or equipment in the event of a fault to the unit.



The unit must be properly grounded. Ground connection is tied to the Main Board "P1" connector pin # C.

Fuse replacement must be performed with power disconnected. Use only the same type fuse. The fuse must be a TR5 microfuse, Time Lag (T), 1 amp, 250VAC. Fuse location shown in section 1.3

PIN OUTS AND WIRING DIAGRAMS

SECTION 2.1: MAIN BOARD/BOTTOM (P1) AND OPTION BOARD/TOP (P2) PIN OUTS

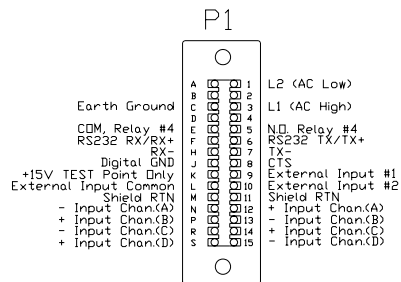


Figure 2.5 (P1) MAIN/BOTTOM BOARD Connector.

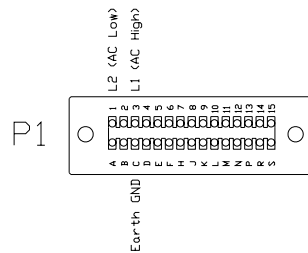


Figure 2.6 115 / 220 VAC Power Connections.

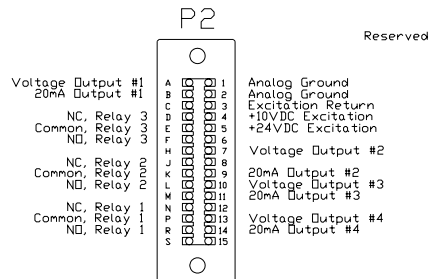
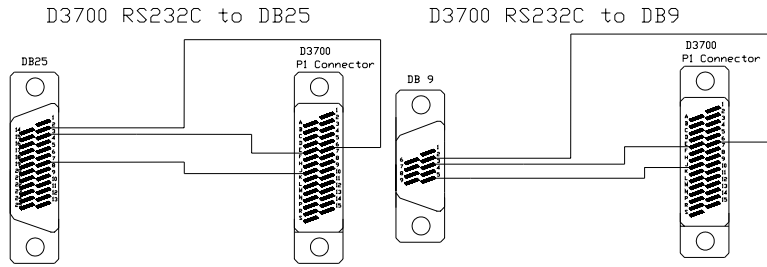


Figure 2.7 (P2) OPTION/TOP BOARD Connector.

SERIAL RS-232C CONNECTIONS ON P1(MAIN BD) CONNECTOR



SECTION 3

OPERATION AND PROGRAMMING

SECTION 3.1: FRONT PANEL KEYS



The front panel keyboard has two modes of operation - SETUP and RUN

SETUP MODE KEYS

SELECT ▲ ▼ **EXIT** **ENTER**

RUN MODE KEYS

F1 **F2** **F3** **F4** **SETUP**

SECTION 3.2: SETUP MODE KEY FUNCTIONS

1. **SELECT KEY** (→ on flow chart indicates to use this key)
 - Selects choice of functions within the menu you are setting up.
 - > Moves you left/right in the program menu.
 - When entering numeric data, it allows the selection of digit to be changed.
 - > Indicated by digit flashing.
 - When selecting decimal point, it moves the decimal point location.
2. **UP ARROW KEY**
 - When entering numeric data, it increments the current value of the flashing digit by one with each push.
3. **DOWN ARROW KEY**

- When entering numeric data, it decrements the numeric value of the flashing digit by one with each push.
4. **EXIT KEY**
- If at a Main branch prompt (CODE, CHAN, OUTPUT, DISPLY or SPEC), it exits to you back to RUN mode.
 - If in a programming branch, it returns you to Main branch prompt.
 - NOTE: It does not store data to memory on its return. **ENTER** key should be pushed first to store selected entry, then **EXIT** key.
5. **ENTER KEY** (↓ on flow chart indicates to use this key)
- Enters selected Main program branch.
 - > Moves you down in the program branch menu.
 - > Menu steps can be skipped by repeatedly pushing **ENTER** key till desired menu step is reached.
 - Enters selected choices, numeric data or decimal point, it store the value and advances to next step in the program menu.

SECTION 3.3: RUN MODE KEY FUNCTIONS

A. Entering SETUP

Push and hold **SETUP** key for 4 seconds. Meter will first display “SET CH” then display “CODE” or flash “SETUP then display “CHAN”.

- “CODE” is flashed with 00 if a lockout code has been set under the Main program branch heading SPEC, CODE menu.
 - > The preset lockout must be entered at this time. If wrong code is entered or if no code is entered within 20 seconds, meter will return to RUN mode.
 - > Upon correct lockout code entry, meter enters the SETUP mode.

- > The unmarked yellow LED just above the Down/F4 key will light, indicating you are in the SETUP mode.
- If no lockout code, "SETUP" flashed then "CHAN" displayed, indicating you have entered the SETUP mode. If no key is pressed within 20 seconds, meter will return to RUN mode.

B. If SETUP key pushed and released meter will enter Select Channel program.

- "SET CH" (SET CHANNEL) will be display.
 - > Push **F1** to select Channel 1 for display
 - > Push **F2** to select Channel 2 for display
 - > Push **F3** to select Channel 3 for display
 - > Push **F4** to select Channel 4 for display

C. FINE TUNE OFFSET/ZERO

Push and hold **SETUP** key, then **DOWN** key pushed at the same time and then both keys released.

This program allows the adjustment of the low input display directly from the run mode of the selected channel. It directly acts as a zero offset.

This

command allows for "On the fly" adjustments of the zero values. The value entered will become the display value for the last measured input.

- Display will flash "OFFSet1" (CHAN 1), or "OFFSet2" (CHAN 2)
- Display with last measured input and least significant digit flashing will appear.
 - > Push **UP** key to increase display
 - > Push **DOWN** key to decrease display
 - > Push **SELECT** key to select digit to be changed
 - > Push **EXIT** key to return to RUN mode

D. FINE TUNE SCALE/SPAN

Push and hold **SETUP** key, then **UP** arrow key pushed at the same time and then both keys released.

This program allows the adjustment of the high input display directly from the run mode of the selected channel to an adjusted scaled value.

- Display will flash "ScALE"
- Display with live input and with most significant digit flashing will appear.
- Push **UP** key to increase display
- Push **DOWN** key to decrease display
- Push **EXIT** key to return to RUN mode.

Note: You are fine tuning the least significant digits.

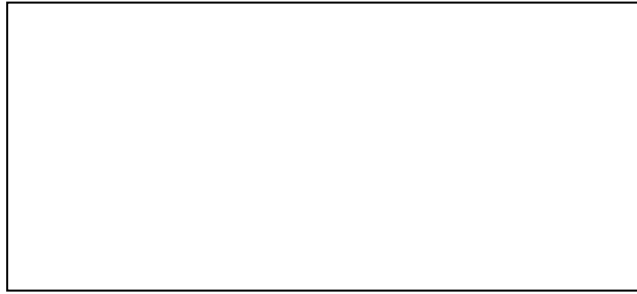
E. USER PROGRAMMABLE MENU LOCKOUT.

To enter, push and hold **SETUP** key, then enter lockout code "55". This program allows user to disable/lockout the following menus from the SETUP program. When the menus are programmed to be locked, the unit will display "disabl" when you try to enter the menu.

NOTE: A code # must be preprogrammed under SPEC, CODE to get the prompt for the code value.

To disable one or more of the selections add the values from the table and enter that number. If 0 is entered, all programs under that heading are enabled.

- "Level1" is flashed with current selected number, valid values 0-15
 - 0 Don't Skip any branches
 - 1 Skip all channel programs "CHAN"
 - 2 Skip all output programs "OutPut"
 - 4 Skip all display program "DISPLy"
 - 8 Skip all special programs "SPEC"



- “CHAN1”, (Only if CHAn is not disabled from above), is flashed with current selected number. Valid values 0-15.
 - 0 Don't disable any channel 1
 - 1 Skip input range selection "InPut"
 - 2 Skip user calibration branch "USEr"
 - 4 Skip input calibration branch "InPut"
 - 8 Skip shunt calibration branch "Shunt"
- “CHAN2” (Only if CHAn is not disabled from above) is flashed with current selected number. Valid values 0-7.
 - 0 Don't skip channel 2
 - 1 Skip input range selection "InPut"
 - 2 Skip user calibration branch "USEr"
 - 4 Skip input calibration branch "InPut"
- “CH3” (Only if CHAn is not disabled from above) is flashed with current selected number. Valid values 0-1.
 - 0 Don't skip channel 3
 - 1 Skip channel 3 "CHAn 3"

- “OutPut” (Only if OutPut is not disabled from above) is flashed with current selected number.
Valid values 0-31.
 - 0 Don’t disable any ouput menus
 - 1 Disable Alarm 1 menu
 - 2 Disable Alarm 2 menu
 - 4 Disable Alarm 3 menu
 - 8 Disable Alarm 4 menu
 - 16 Disable the Source menu

- “SPEC” (Only if SPEC is not disabled from above) is flashed with current selected number.
Valid values 0-65535 (default 32768)
 - 0 Don’t disable any menus
 - 1 Disable ‘F1 SET’
 - 2 Disable ‘F2 SET’
 - 4 Disable ‘F3 SET’
 - 8 Disable ‘F4 SET’
 - 16 Disable ‘r In 1’
 - 32 Disable ‘r In 2’
 - 64 Disable ‘r In 3’
 - 128 Disable ‘r In 4’
 - 256 Disable ‘20 PT’
 - 512 Disable ‘PEAK 1’
 - 1024 Disable ‘PEAK2’
 - 2048 Disable ‘SCALE2’
 - 4096 Disable ‘CODE’
 - 8192 Disable ‘dEFAUL’
 - 16384 Disable ‘rESoLU’
 - 32768 Disable ‘A2d’

- If EXIT key is push at any of the 6 main heading, exit back to run mode.
- If EXIT key is push while in a main branch, exit back to that main branches heading.
- If SELECT key is push while at main branch heading, advance to next main branch.
- When “skip code number” is entered by ENTER key, advance to next branch heading.

F. F1, F2, F3 and F4 keys

The RUN mode keys(F1-F4) functions are selected in the SETUP mode under the Main program branch heading SPEC. The function are described under the SPECIALS FEATURES PROGRAMMING BRANCH section of the manual (See pg. 26). The following are the available selections.

- "Alarm 1" through "Alarm 4"
- "TARE 1", "TARE 2", "TARE 3", "TARE 4"
- "RESET"
- "CHANNEL 1, 2, 3, 4, or 5"
- "PEAK 1"
- "PEAK 2"
- "SCALE2"
- "NET"
- "HOLD" (Scan Mode)

SECTION 3.4: PROGRAMMING TIPS

→ **SELECT Key** This represents **SELECT** key on flow charts

↓
ENTER Key This represents **ENTER** key on flow charts

Numeric values are entered by;

- Entering a number in flashing digit with the “UP” and “Down” keys.
- Advance to the next digit using **SELECT** key. Enter value and advance using **ENTER** key.

ENTER key sets number into memory and advances to next program.

EXIT key :

1. From MAIN BRANCH heading, takes you back to run mode
2. From PROGRAM BRANCH, takes you back to MAIN BRANCH heading you are in.

TIMED OUT EXITS:

1. If no key is pushed within 20 seconds while at CODE or main branch heading, meter will automatically exit back to run mode.
2. If no key is pushed within 2 minutes while in any other program branch, meter will automatically exit back to run mode.

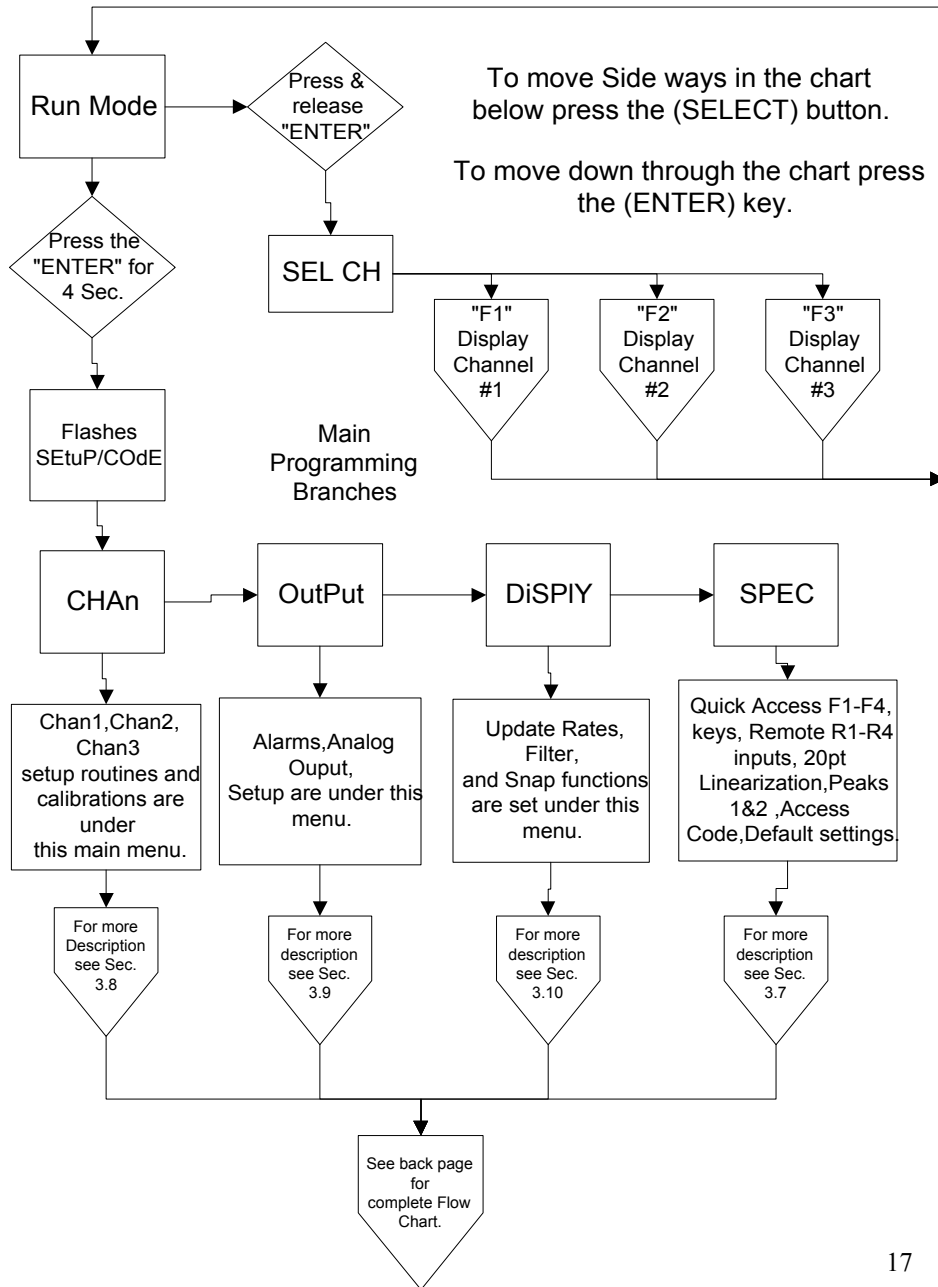
SECTION 3.5: ENTER SETUP

- Press and hold **SETUP** key for 4 seconds. Meter will display “SEL CH” at first then will enter into the Setup mode. The meter will display “CODE” or “CHAN”.
 - “CODE” is flashed with 00 if a lockout code has been set under the Main

program branch heading SPEC, CODE menu.

- The preset code (1-40) must be entered at this time. If wrong code is entered or if no code is entered within 20 seconds, meter will return to RUN mode.
- Upon correct lockout code entry, meter enters the SETUP mode. The status LED between Valley and NET will light indicating the meter is in the Programming/Setup mode.
- The unmarked yellow LED just above the Down/F4 key will light, indicating you are in the SETUP mode.
- If no lockout code, "SETUP" flashed, then "CHAN" displayed, indicating you have entered the SETUP mode. If no key is pressed within 20 seconds, meter will return to RUN mode.

SECTION 3.6: MAIN PROGRAMMING BRANCHES



SECTION 3.6 (cont.)

"CODE" is displayed if a lock out code has been programmed.

- If "CODE", then enter your Lockout Code number (1-99)
- If no "CODE" then "CHAn" is displayed

Use **SELECT** key to choose which branch you wish to enter. Then press **ENTER** key to select that branch to program. Selections are: "Chan", "Output", "Disply", and "Spec".

SECTION 3.7: CHANNEL SETUP PROGRAMMING BRANCH

Press **SELECT** key to choose which channel you wish to program. Then press **ENTER** key.

- CHAn 1 is input channel 1
- CHAn 2 is input channel 2
- CHAn 3 is input channel 3
- CHAn 4 is input channel 4
- CHAn 5 is math channel

There are 5 separate channel setups. Four for the analog input channels (Channel 1, Channel 2, Channel 3, Channel 4) and one for the math channel(Channel 5)

1. Channel 1 through Channel 4 Scaling and Offsetting methods to display in engineering units
 - There are 2 methods to perform the setup of the Channels.
 - At the beginning of each of the calibration methods there is a display that shows the raw unscaled input signal. This allows the user to verify the incoming signal is present and what value it is.
 - a. Method 1 (U CAI)
 1. Raw input is displayed. For exact calibration purposes you can input the low and high inputs and record their value for entry in the low and

high input values below. Push **ENTER** key to advance.

2. "dEC Pt" selects decimal point. Push **SELECT** key for displaying decimal point selections and **ENTER** key to confirm choice.
3. "In Lo" enter in low input value
4. "dSP Lo" (display low) enter in display value corresponding to low input value.
5. "In HI" enter in high input value.
6. "dSP Hi" (display high) enter in display value corresponding to high input value.

b. Method 2 (Ld CAL)

NOTE: Input Signal must be applied to the unit for low and high display values. The meter compares the input signal to the display value entered and scales the meter based on the two inputs.

1. Raw input is displayed. This can be used to make sure the correct input is being applied and/or that the meter is properly measuring it. Push enter to advance.
2. "dEC Pt" selects decimal point. Push **SELECT** key for displaying decimal point selections and **ENTER** key to confirm choice.
3. "dSP Lo" (display low).

Either select "Yes" or "nO" here.

"Yes" allows you to apply corresponding low input signal to input and enter in corresponding low display value. Push **ENTER** key to make displayed value equal input. If "NO" is selected it skips over this program and leaves values to what they were.

4. "dSP Hi" (display high).
 Either select "yES" or "nO"
 If "yES" is selected, this allows you to apply corresponding high input signal to input and enter in corresponding high display value. Push **ENTER** key to make displayed value equal input. If "NO" is selected it skips over this program and leaves values to what they were.
5. "EnAbLE" (Enable). This enables the above calibration setup by the inputs. This allows for the low value and high values to be set at different times and then enabled when both are complete.
 - "NO" leaves calibration unchanged
 - "YES" enables this calibration and overrides any previous calibration by the USER or SHUNT type calibration

2. Channel 5 (Math Channel)

- a. "TyPE" Select for channel 3 to be one of following:
 - "CHAn 1" channel 1's raw input count
 - "CHAn 2" channel 2's raw input count
 - "CHAn 3" channel 3's raw input count
 - "CHAn 4" channel 4's raw input count
 - "Add" Sum of Channel 1 and 2
 - "Sub" Difference of channel 1 – 2
 - "Div" Result of channel 1 ÷ 2
 - "P1-P2" Peak1 – Peak2
 - "AVG" AVG of Channel(1+2+3+4)/4
 - "SUM" Sum of all 4 channels
 - "MUL" Product of CH1 x CH2
- b. Raw input is displayed. For exact calibration purposes you can input the low and high inputs and record their value for entry in the low and high input values below.
NOTE: The low and high values are the result of the

above selected math formulas. Push **ENTER** key to advance.

- c. "dEC Pt" selects decimal point. Push **SELECT** key for displaying decimal point selections and **ENTER** key to enter choice.
- d. "In Lo", enter in low input value
- e. "dSP Lo", (display low) enter in display value corresponding to low inpt value.
- f. "In HI", enter in high input value.
- g. "dSP HI", (display high) enter in display value corresponding to high input value.
- h. " OFFSE" Enter an offsetting factor from -9999 to 9999, which is applied after the above scaling.

SECTION 3.8: OUTPUT SETUP PROGRAMMING BRANCH

Push **SELECT** key to choose which output you wish to program. Then press **ENTER** key.

"AL AR" is the 4 alarm output setups, "AnALOG" is analog output setup

1. ALARMS

This setup menu programs the 4 alarms.

NOTE: Relays 1 through 3 are optional FORM "C" relays and located on the option/top board.

Relay 4 is standard FORM "A" relay and located on the main/bottom board.

- a. "AL Ar" selects which alarm is to be programmed. Use **SELECT** key to view choices of alarms 1 through 4. Use the **ENTER** key to enter choice.

Note: 1. Each alarm is treated completely independent thus allowing all 4 to be programmed with same channel or different channels controlling one alarm.

- 2. Alarm one is different from one standpoint. It has the additional

selection of "SAFE"(fail safe) selection.
The selection "SAFE" here controls
relays 1 through 3 for the fail safe
operation.

- b. "CHAnEL" selects which channel alarm is being assigned to. Use **SELECT** key to view choice of channels. Use **ENTER** key to enter choice.
- c. "rELAY" selects which relay (1 through 4) is being programmed. Use **SELECT** key to view choices of outputs. Use the **ENTER** key to enter choice.
NOTE: Relays 1 through 3 are optional and located on the option/top board. Relay 4 is standard and located on the main/bottom board.
- d. "TYPE" selects what type of alarm. Use **SELECT** key to view following choices. Use the **ENTER** key to enter choice.
 - 1. "ALAr HI" (alarm high) selects alarm to trigger when input goes over programmed set point.
 - 2. "ALAr LO" (alarm low) selects alarm to trigger when input goes under programmed set point.
- e. "SEt Pt" (set point) enter number at which alarm will occur.
 - Set point can also be programmed from the RUN mode when an "F" key is assigned to display alarm. If "F" key is held for @ 4 seconds, the display will start flashing the right hand digit signifying the new set point can be entered.
Note: The corresponding front panel alarm LED is on when in alarm.
- f. "HySt" (hysteresis/deadband) enter number. This number is added to a low limit or subtracted from a high limit before an alarm condition is cancel. It is typically used to prevent alarm chatter. This is set under Alarm # 1 for all Alarms.
- g. "LatCH" selects alarm to latching or non-latching(follows input). If LATCHING is selected,

alarm will remain on till manually reset. Use **SELECT** key to view “YES” for latching and “NO” for non-latching. Use the **ENTER** key to enter choice. Note: “reset” function programmable for front panel key or remote input, is used to reset the latched alarm.

- h. "SAFE" ("ALARM 1" ONLY) selects alarms 1 through 3 to be in a safe mode(de-energizes on alarm) or standard (energizes on alarm). Use **SELECT** key to view “YES” for safe and “NO” for standard. Use the **ENTER** key to enter choice. Note: This is used to determine what the alarms do when loss of power occurs to meter. With "SAFE" selected alarm will turn on when power fails.
- i. "FLASH" selects alarm to flash display when in alarm. Use **SELECT** key to view “YES” for flash display and “NO” don’t flash display. Use the **ENTER** key to enter choice.

2. ANALOG OUTPUT

This setup menu programs the analog output/retransmission.

- a. "SOUrCE" selects what the analog output will be based upon. Use **SELECT** key to view choices. Use **ENTER** key to enter choice. After choice is entered then addition choices are entered.

1. Selections are:

- "CHAn 1" Channel 1
 - a) "Gross" gross value
 - b) "nET" net value
 - c) "PEAK 1" peak 1 value
- "CHAn 2" Channel 2
 - a) "Gross" gross value
 - b) "nET" net value
 - c) "PEAK 1" peak 1 value
- "CHAn 3" Channel 3
 - a) "Gross" gross value

- b) "nET" net value
 - c) "PEAK 1" peak 1 value
 - "CHAn 4" Channel 4
 - d) "Gross" gross value
 - e) "nET" net value
 - f) "PEAK 1" peak 1 value
 - "CHAn 5" Channel 5
 - g) "Gross" gross value
 - h) "nET" net value
 - "PEAK 1" peak 1 value
 - "dISPLy" What ever is currently selected
- b. "OuT" selects what the analog output will be
- "4-20" 4-20mA
 - "0-10" 0-10VDC
- c. "dSP Lo" enter what the low display value that will represent the low analog output value
- d. "dSP HI" enter what the high display value that will represent the high analog output value

SECTION 3.9: DISPLAY SETUP PROGRAMMING BRANCH

The Display section allows the user to select between two modes of operation, (NORMAL, or SCAN). The NORMAL mode allows the display to show one channel continuously.

The SCAN mode allows the unit to scan the programmed channels at approx. 1sec intervals. The selection of scanning is (Channel 1,2), (Channel 1,2,3), (Channel 1,2,3,4), or (Channel 1,2,3,4,5). By programming a function key for "HOLD" allows the unit to scan the channels with a temporary hold of the scan mode when the function key is pressed.

SECTION 3.10: SPECIAL FEATURES PROGRAMMING BRANCH

Use **SELECT** key to choose which function you wish to program.
Then press **ENTER** key.

- "F1 Set" thru "F4 Set" programs the RUN mode function of the 4 F keys
- "r in 1" thru "r in 4" programs the function of the 4 remote inputs
- "PEAK 1" programs the peak or valley function of each channel
- "PEAK 2" programs second the peak or valley function of each channel
- "SCALE2" programs the second scaling parameters of each channel
- "CodE" programs the lockout code for authorized entry into SETUP
- "dEFAUL" sets meter setup back to default setup
- "rEs" sets the resolution for the meter (4.5 or 5.5 digits)
- "A2d" - **For factory use only**

1. "F1 Set", "F2 Set", "F3 Set" and "F4 Set" - RUN MODE
function key setup

This programs the function of the 4 front panel F keys.

- A. "rESEt" assigns **F** key for resetting latched outputs
- Pushing **F** key will reset all relays in an alarm condition.
- B. "SCALE2" assigns **F** key to initiate 2nd scaling to be applied.
- Pushing **F** key will switch displayed channel to 2nd scaling.
 - Front panel S2 LED will light to indicate 2nd scaling is applied.
 - Push **F** key while S2 is selected will change scaling back to initial scaling
 - If different channel is selected while 2nd scaling is selected, it will also use the 2nd scale factor applied to it.

- C. "nEt" assigns F key to switch displayed channel between gross and net
- Pushing **F** key will switch displayed channel to display net.
 - Front panel NET LED will light to indicate NET is being displayed.
 - Push **F** key while net is selected will change display back to gross.
 - If different channel is selected while net is selected, it will also display net.
- D. "PEAk 1" and "PEAk 2" assigns programmed peak function to F key
- Pushing **F** key will display the assigned peak function. If peak was assigned peak LED on front panel will also light. If Valley then valley LED will light.
 - Pushing **F** key for 4 seconds will reset the peak/valley.
- E. "ALAr 1" thru "ALAr 4" assigns alarm function to F keys
- Pushing F key displays current alarm set point
 - Pushing F key for 4 seconds allows set point value to be changed.
Current set point is displayed with the right most digit flashing. The set point can now be changed with the **UP** and **DOWN** keys. Select digit to be changed with **SELECT** key. Press **ENTER** key to enter new value into memory and return to RUN mode
- F. "tArE 1", "tArE 2", "tArE 3", "tArE 4" assigns F key for tare function. 1 for channel 1, 2 is for channel 2, 3 is for channel 3, 4 is for channel 4.
- Pushing **F** key will zero the channel for the input present.

- Pushing **F** key for 4 seconds will reset the tare value to zero.

- ! "CHAn 1" assigns F key to display channel 1
- ! "CHAn 2" assigns F key to display channel 2
- ! "CHAn 3" assigns F key to display channel 3

2. "r in 1", "r in 2", "r in 3", and "r in 4" remote inputs. RUN mode remote/external input setup

The 4 Remote input functions are selected under the Main program branch heading "SPEC". The following are enabled by a TTL level applied to the input..

- ! "RESEt" - Resets latched relays
- ! "TarE" - Zeros display for channel being displayed.
- ! "HOLd" - Freezes display and suspends measurements
- ! "SCALE2" - Selects second scaling to be applied to channel being displayed. S2 light on front panel is lit.
- ! "LOCK" - Locks out access to the SETUP programs
- ! "PEAk 1" - Display PEAK 1
- ! "Peak 2" - Display PEAK 2
- ! "Alarm" - Disables alarms. Meter functions normally but no alarms are activated when they go beyond their preset limits.
- ! "dEC Pt" - Selects the decimal point programmed
- ! "CHAn" - Selects the channel programmed
- ! "Preset" - Resets both peak and valleys.
- ! "Gross" - Displays Gross value of channel
- ! "PrinT" - Initiates a print of the current display through the RS-232C serial port. (T option required for this function.)

3. "PEAK 1" and "PEAK 2" setup

Programs the functions of the 2 peak capture inputs. Each peak can be individually programmed.

"tYPE" Select if peak to be highest or lowest valley

"HI" High/Peak selection

"Lo" Low/Valley selection

"CHAn 1", "CHAn 2". "CHAn 3" Select channel to do peak on

4. "Scale 2" setup

Programs the setup and assignment of the second scale factor. This would typically be used to switch the display between English and Metric engineering units. The selection of scale 2 can be activated from a Front Panel Key (F1 - F4) or a remote input. They must be programmed to perform the switch to scale 2 under the "SPEC" branch programming.

"CHAn 1", "CHAn 2" Select which channel the second scale factor is being setup for. Both channel 1 and channel 2 can be setup for an individual second scale factor.

"dEC Pt" selects decimal point. Push **SELECT** key for displaying decimal point selections and **ENTER** key to confirm choice.

"In Lo" enter in low input value

"dSP Lo" (display low) enter in display value corresponding to low input value.

"In HI" enter in high input value.

"dSP Hi" (display high) enter in display value corresponding to high input value.

5. LOCK OUT CODE SETUP

This enable the program of a lockout code (0 to 99) to limit the entry into the setup mode. Once a code is entered here, it must be enter upon trying to enter the setup mode when the meter prompts for "CODE". Setting the code to 00 disable the lockout code function.

"CodE" is flashed with the lock out code currently programmed. Enter in a new code or exit the program (**EXIT** key).

6. DEFAULT program

This program is used for any of the following:

- Reset the meter back to the factory defaults.
- Set the user defined defaults into memory

- Reset the meter to the user defined defaults
- "DEFAUL" default program prompt
- "YES"/"NO" "No" to exit this menu
 "Yes" if one of the 3 defaults is to be done. Continue to next step
- "USEr"/"Fac"
- "FAC" (factory) allows the reset of the meter back to factory defaults. When the prompt
 - i) "FacTrY" is displayed, the **SELECT** key must be pushed and held (**10 seconds**) until the prompt "dONE" and returns to "SPEC" branch. If any other key is push it will abort the default operation and return to "SPEC" branch.
 - "Usr" (User) allows the setup of custom defaults or default to the custom defaults
 - j) "StorE" allows the custom defaults to be set. This will set the defaults to the setup of the meter it is currently programmed.
 - "SET df" When this is displayed the **SELECT** key must be pushed and held until the "dONE" prompt. Meter then returns to "SPEC" branch heading.
 - "GET df" When this is displayed the **SELECT** key must be pushed and held until the "dONE" prompt. This takes approximately 10 seconds. Meter then

returns to "SPEC"
branch heading.

8. Resolution selection

This allows user to select the resolution and speed. The selection applies to channel 1 and channel 2 inputs.

"rEs"

"4.5" selects resolution of 4 ½ digits at 60/second update

"5.5" selects resolution of 5 ½ digits at 60/second update

9. "A/D"

For Factory Use only

SECTION 4 FEATURES

The following options are available on the IPM525:

1. Feature C 3 each Form C relay outputs
2. Feature F Factory Calibration (Optional)
3. Feature H 16 bit D/A analog output
4. Feature P 10VDC and 24VDC excitation
5. Feature T RS-232C @ 9600 BAUD
6. Feature U RS485 Communication (Coming soon)

FEATURE C:

- 3 each form C (single pole double throw) relays rated at 5 amp @ 240VAC, 5amps @ 30VDC.
- Located on the option/top printed circuit board

FEATURE F:

- Factory calibration (user provides input range and display range)

FEATURE H:

- 4 analog outputs with menu selection of 0-20mA, 0-10VDC
- Update rate of 5/second

- Resolution - 16 bit D/A
- Located on the option/top printed circuit board

FEATURE P:

- Excitation supplies of:
 - 24VDC @150mA
Accuracy: .5%
 - 10VDC @200mA supply
Accuracy: .5% (adjustable)
- Located on the option/top printed circuit board

FEATURE T:

- Serial RS-232C Communication.
- Configuration of 9600 baud, No Parity Check, 8 DATA Bits, with CTS handshaking available.

FEATURE U:

- Serial RS-485 Communication.
- Multi drop full RS485 addressable to 99.

SECTION 5 SPECIFICATIONS:

	±20 mA	+/- 30 mV	+/- 100 mV	+/- 200 mV	+/- 2V	±10V
Accuracy	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%
Zero Drift	autozero	Autozero	Autozero	autozero	autozero	autozero
Span Drift	10 ppm/°C	10 ppm/°C	10 ppm/°C	10 ppm/°C	10 ppm/°C	10 ppm/°C
Input						

Impedance	50 Ohms	10 Mohm	10 Mohm	10 Mohm	10 Mohm	10 Mohm
Resolution	1 uA	1 uV	10 uV	10 uV	100 uV	1 mV
Over-range Capability, minimum	10%	10%	10%	10%	10%	10%

Normal Mode Rejection Ratio	63 bB, 50/60 Hz
Common Mode Rejection Ratio	130 dB, 50/60 Hz
Response Time	100 msec max to display (10 updates / sec)
Internal Resolution	22 bits
Conversion Time	52mS
Digital filter	60 Hz in 4 1/2 digit mode/50Hz in 5 1/2 digit mode

Warm Up Time	15 minutes
Operating Temp range	-20°C to 60°C
Storage Temp range	-20°C to 85°C
Humidity	To 95%, non-condensing

AC supply voltage	115 or 220 VAC
Power Consumption	7 Watts maximum

Isolation	
Signal Input to Earth Ground:	Safety rated to 450 Vrms, 2200Vp high voltage test
Option board to Earth Ground:	Safety rated to 450 Vrms, 2200Vp high voltage test
Option board to Signal Input:	400 Vp
Power to Earth Ground:	Safety rated to 500 Vrms, 4000 Vp high voltage test
Main Bd. Relay	Contact Rating : 30VDC @ 1 A