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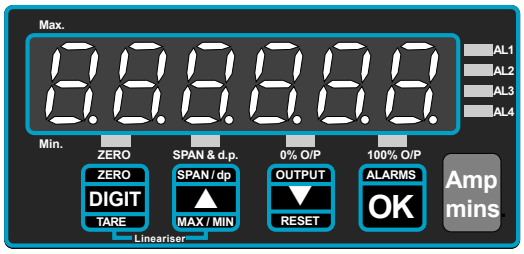


Ampere Time Display Meter

Plating Current monitor with pulsed outputs

Model INT-AH

Rev AH 1.1 Software Version

IEC 1010

CE

89/336/EEC

Document Ref:pm65\manuals\INTUITIVE_AH Revision:1 Dated: 31 July 2003

Notes

Alphabetic Index

Important Introductory Notes

Please feel welcome to contact us if you need help, have a complaint, or if you have suggestions for improving our products or services.

If you contact us about a product you already have, please give us as much information as you can, so we can give you accurate and swift help.

Software Version: The display will show the software version if you press the left-hand button while you apply power to the meter.

Our products have a 2 year warranty, and we will put right or replace any meter found to be faulty through bad workmanship or materials. This warranty does not cover damage caused by misuse or accident.

IMPORTANT If the meter is a vital component in your process, you may wish to buy a spare to cover possible failure or accident, as we cannot guarantee instant repair or replacement. We always try to improve our products and services, so changes to instruments will occur. Please keep this manual safely for future reference, as future manuals, covering revised designs may no longer describe your product accurately.

We believe these instructions are accurate, and that we have competently designed and manufactured the product. We do not make any claims as to the suitability of this product for any particular application. The choice of product and responsibility for the choice lies with the User.

Our full terms and conditions of trading are available on request.

Warnings 

Please carefully read all warnings and ONLY install the meter when you are sure that you've covered all aspects.

* Connect the meter according to current IEE regulations and separate all wiring according to IEC1010.

* Power supplies to this equipment must be anti-surge fused at 125mA for 230V supply, 250mA for 110V supply or 1A for DC supplies in the range 11-30VDC.

* Check that model number and supply voltage suit your application before you install the meter.

* Don't touch any circuitry when the meter is powered, because lethal voltages may be present on the circuit board.

* We have designed this product for Installation class II service.

* We have designed this product for use in Pollution-Degree 2 environments.

* Only adjust switches or connections with the power removed.

* Ensure all screw terminals are tight before applying power.

Safety First .....Don't assume anything..... Always double check. If in doubt, ask someone who is QUALIFIED to assist you in the subject.

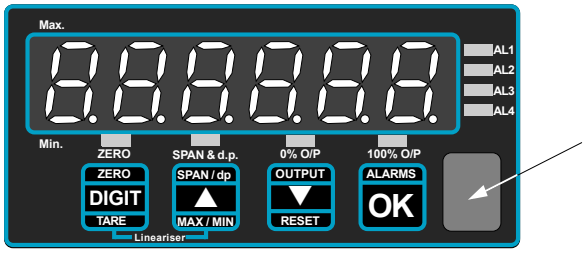
General Description

This meter has been designed to be simple to configure. It is easy to use because no menu is used. Look at the front panel below... to adjust ZERO you press the ZERO button, to adjust Span you press the SPAN button, to adjust Alarms you press the ALARM button. There is no need to spend time learning a complex menu system.

The meter's main function is to totalise (or integrate) from a linear millivolt signal, typically from a DC current shunt. This meter can accept shunts with 50mV, 60mV, 75mV and 100mV outputs.

The meter can give alarm outputs, scaled and isolated analogue output and isolated serial data retransmission when fitted with appropriate plug-in option boards. Alarm outputs 2 and 4 give pulsed outputs of 100mS, each time a batch total has been reached.

The front panel has a 6 digit, 7 segment window for displaying the measurement. It allows decimal point and minus sign characters to be included and has 4 alarm annunciators to show the status of each alarm relay.



"Units of measure" window

The front panel pushbuttons each have an LED to show which setting is being altered at any time.

A lockout switch on the rear of the meter saves your configuration settings in non-volatile memory, which has a 10 year guaranteed storage period. If the lockout switch is not set ON, your settings could be accidentally altered.

Getting Started

First, please check that the display will suit all the requirements of your application. Page 4 has some important warnings - please check that all warnings are covered.

If you have alarm relay output options, you may need to configure the board before installing the meter in a panel. See the separate sections in this manual for that option.

Check that your panel cutout is correct , 92mm wide, 45mm high. You must fit the meter in a protective enclosure for installation class II service. Remove the 2 screws holding the U clamp at the rear of the case. Slide the meter into the cutout and re-fit the U clamp and screws. Tighten the screws just enough to hold the meter firmly in place and make sure the sealing gasket is evenly held between the panel and the bezel.

Connect the signal and power cables, to the appropriate screw terminal connectors. Check that you are using the correct terminals or you may cause damage to the meter. Do not connect any output or alarm cabling yet.

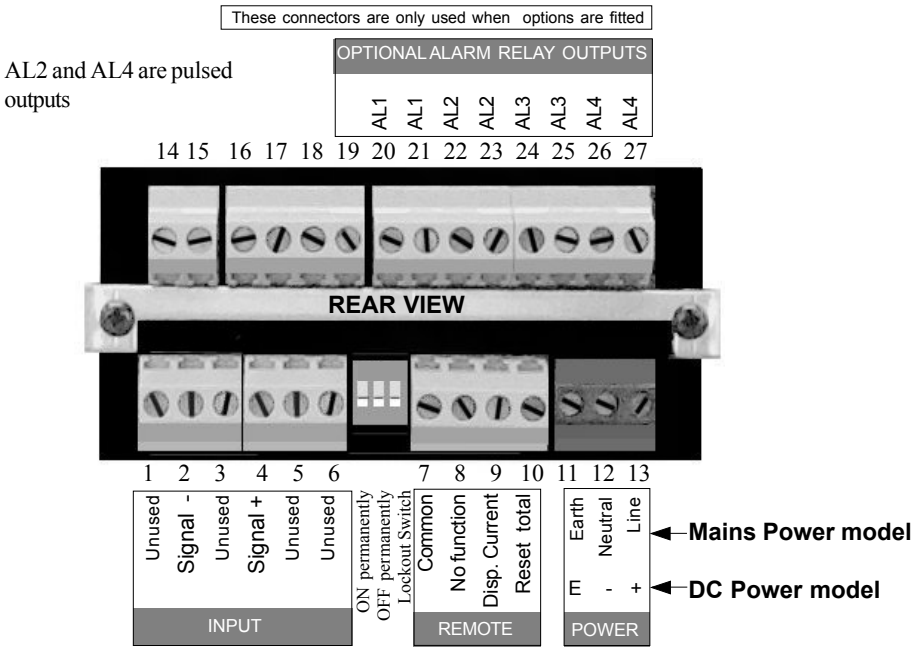
Apply power, and confirm that the meter illuminates all segments for a few seconds.

The lockout switch should be OFF to allow you to change the meter's settings. Set the scaling to suit your system, using one of the scaling methods described in this manual. Check that the meter responds correctly. Now, adjust your alarm settings, if necessary. Use a continuity tester to check that the relay contacts operate correctly. Switch the meter off, and check alarm relay contact status. Check that the contact status suits your system, in conditions of power loss to the meter.

When you have verified all settings, you can connect the alarm relay cables, to check that your system operation is satisfactory.

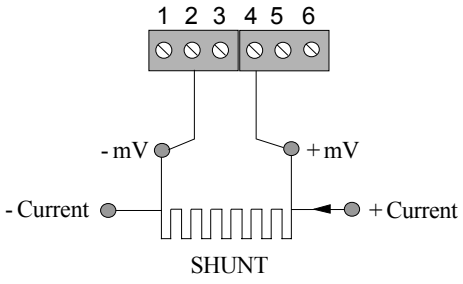
Remember to set the lockout switch ON when you have finished , to prevent accidental loss of your settings.

Connections



Cabling should be screened and routed away from noise-carrying cables and machines to reduce interference. The screen can be connected to power earth if it is not already grounded at the shunt end.

The shunt should be located in the low voltage unswitched return line to minimise common-mode noise.



IMPORTANT!
Set the right-hand switch to its upper 'LOCK' position after setup, to save your settings.

Calibration

Set switch 1, near the input connector ON and lockout switch OFF

1) How to set SPAN and DECIMAL POINT
Press the SPAN button for 3 seconds.

You will see 'Int H' or 'Int M' to allow you to calibrate in counts per hour or minute. Select the most appropriate, and press OK (Int H is used for Ampere Hours)

You'll now see 'In HI' briefly, then a value, with one digit brighter than the other. This is set to the mV output of your shunt at rated current, usually 50, 60 or 75mV. If the value is correct, press the 'OK' button, otherwise use the 'DIGIT' key to select digits, and the 'UP' or 'DOWN' arrow keys to alter. When correct, press the 'OK' button.

'rd HI' appears briefly, then a value, with one digit brighter than the other. This is what will be displayed for the IN HI input, at full scale, after 1 hour or 1 minute, depending on whether you chose 'Int H' or 'Int M'. For ampere hour applications, this is normally the rated current of your shunt. If the value is correct, press the 'OK' button , otherwise use the 'DIGIT' key to select digits, and the 'UP' or 'DOWN' arrow keys to alter . The ***Decimal point*** position may be set after the most significant digit has been selected. When correct, press the 'OK' button.
See the following page for examples ...

2) How to set ZERO
Press the ZERO button for 3 seconds. You'll see 'IN LO' briefly, then a value, with one digit brighter than the other. This is normally set to 0. If already correct, press the 'OK' button. Or, use the 'DIGIT' key to select digits, and the 'UP' or 'DOWN' arrow keys to change. When correct, press the 'OK' button.

You'll now see 'LO rd' briefly,then a value, with one digit brighter than the other. This is normally st to 0. If already correct, simply press the 'OK' button. Or, use the 'DIGIT' key to select digits, and the 'UP' or 'DOWN' arrow keys to change. When correct, press the 'OK' button.

See the following page for examples ...

Now, please set the LOCKOUT switch ON to protect your settings

Calibration Examples

1. You have a 75mV shunt rated at 200 Amperes and want to display ampere hours to a resolution of 0.1Ah

   a. Set '**Int H**' because you want to count ampere HOURS
   b. Set InHi = 75.00 mV
   c. Set rd Hi to 200.0
   d. Set InLO to 0.00 mV
   e. Set lo Rd to 0

2. You have a 60mV shunt rated at 100 Amperes and want to display ampere hours to the nearest Ah

   a. Set '**Int H**' because you want to count ampere HOURS
   b. Set InHi = 60.00 mV
   c. Set rd Hi to 100
   d. Set InLO to 0.00 mV
   e. Set lo Rd to 0

Features

Calibration Counter / Tamper detector
An internal totaliser counts each calibration. To see the cal count, press the left-hand button at power-on. The 'CAL XX' value appears for a second or two after you switch the meter on. The number starts at 00 and can go up to FF (255 counts). It doesn't count changes of setpoints. It stores the total in non-volatile memory which can't be reset, so is useful for keeping track of the meter's calibration history.

Reset Command
The reset command clears the accumulated total. It may be accessed either from the front panel or by external contact closure command.

Front Panel key reset command
1) Link terminal 7 to terminal 10
2) Set lockout switch 'ON'
3) Press Down Arrow key to reset display

Remote contact closure resetting
1) Connect a normally-open contact closure switch between terminals 7 and 10
2) Set lockout switch 'ON'

Display 'Actual Current' Command
The 'display rate' input allows you to see the instantaneous current. It may be accessed either from the front panel or by external contact closure command.

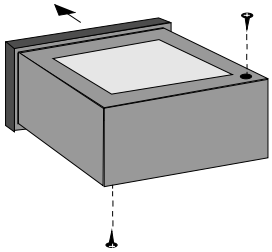
Front Panel key Current display command
Press the UP arrow key to see actual current.

Remote contact closure rate display command
1) Connect a normally-open contact closure switch between terminals 7 and 9
2) When you make a contact closure between terminals 7 and 9, the display will show the intantaneous value, for as long as the contact is closed.

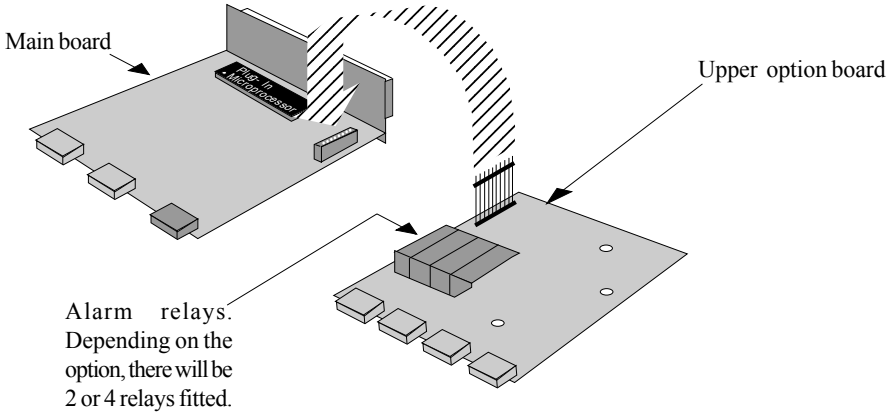
How to install alarm option boards

If you want to open the meter to install or modify option boards, follow these steps...

1) Switch off power to the meter and unplug all connectors.
2) Unclip the front bezel. This is easier if you squeeze the top and bottom of the case, near the front.
3) Remove the small screws shown in the diagram. If the meter doesn't yet have an output option board, the top screw may not yet be fitted.
4) Slide the electronic boards out throught the front of the case. You can easily separate the upper option board from the main board. We strongly suggest that you use anti-static precautions to prevent damage to the semiconductors.



The board assemblies will look something like this...



Always be careful to connect the pins to sockets accurately. When reassembling, make sure option boards are firmly fixed to the upper option board. When the boards are replaced in the case, secure them again with the two small black screws.

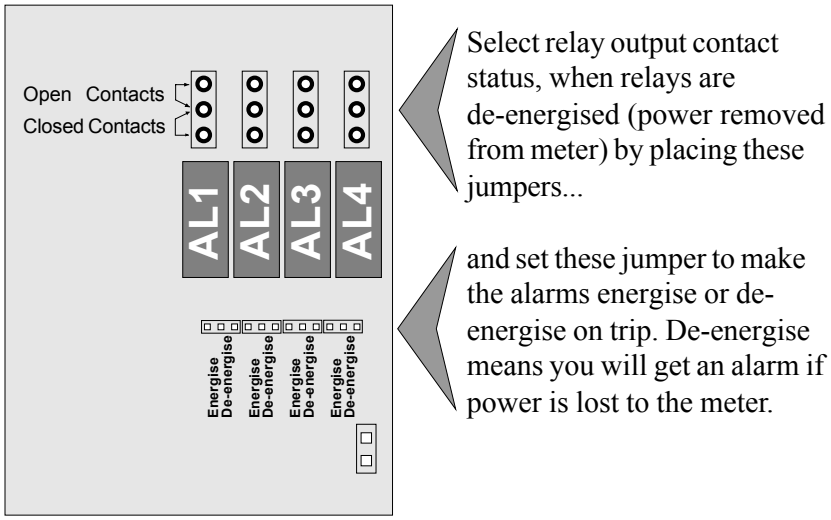
Alarm Board Configuration & Adjustment

For failsafe operation (where contacts open on alarm or when power is lost to the meter) set the jumpers for OPEN CONTACTS and DE-ENERGISE on alarm.

To access to the alarm board, first remove power from meter, including any power which might be on the alarm output circuitry.

Look on the top and bottom surfaces of the case, near the rear. You will see two small screws, one on each surface. Remove both screws. Now, clip off the front bezel and slide the meter assembly carefully out via the front of the case.

The relay board plugs into the main board. Gently separate the two boards.



When you have set the jumpers, refit the board to the meter and carefully slide the assembly back into the case.

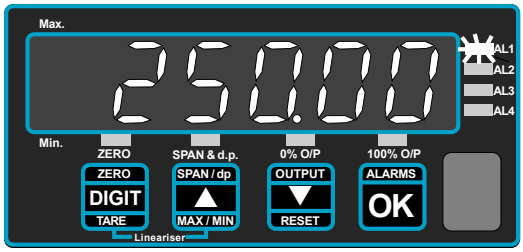
Fit the two small board screws to the top and bottom surfaces.

Alarm settings

NOTE : totalisation stops during alarm adjustment

Alarm 1 and 3 relate to the accumulated total. Alarm 2 and 4 relate to pulsed outputs.

If you press the ALARMS button momentarily, you can view each of the 4 alarm settings (each press will illuminate in turn AL1, AL2, AL3 and AL4 LEDs). alarm settings are not locked out by the lockout switch.



Alarm channel LED will flash.

Here, we see that Alarm 1 has its setpoint at 250.00

To change alarm settings, select the alarm you wish to change as shown above until its LED is flashing, then press the ALARM key for more than 3 seconds. You will see one digit is brighter than the others. You can change its value using the UP/DOWN buttons, and then select other digits with the DIGIT pushbutton. When the value has been set, press OK.

The alarm action is now displayed. This will show 'HI' for HIGH alarm action, or 'off' for NO alarm action. You can change this with the UP/DOWN buttons. Press OK when set.

Equipment Specifications

Bezel size	48mm high by 96 mm wide (1/8 DIN)
Panel Cutout	45 mm high by 92 mm wide
Case Depth	125 mm including connectors
Weight	300 grammes
Case Material	Black polycarbonate
Connectors	Detachable Screw Terminal connectors
Power	95-265 VAC or 11-30 VDC optional
Burden	8VA maximum
Input Signals	0-100mV range, for 0-50mV, 0-60mV, 0-75mV shunts
Input Resistance	>1 Megohm
Accuracy	+/-0.05% of range
Span tempco	50ppm/Degree Celsius
Zero Tempco	+/- 2microvolts per Degree Celsius
A/D conversion	Dual slope 10 conversions per second. Resolution 1 in 63000 max. over full range
Display update rate	2.5 readings per second.
Memory of total	E2PROM with 10 year storage. No batteries required

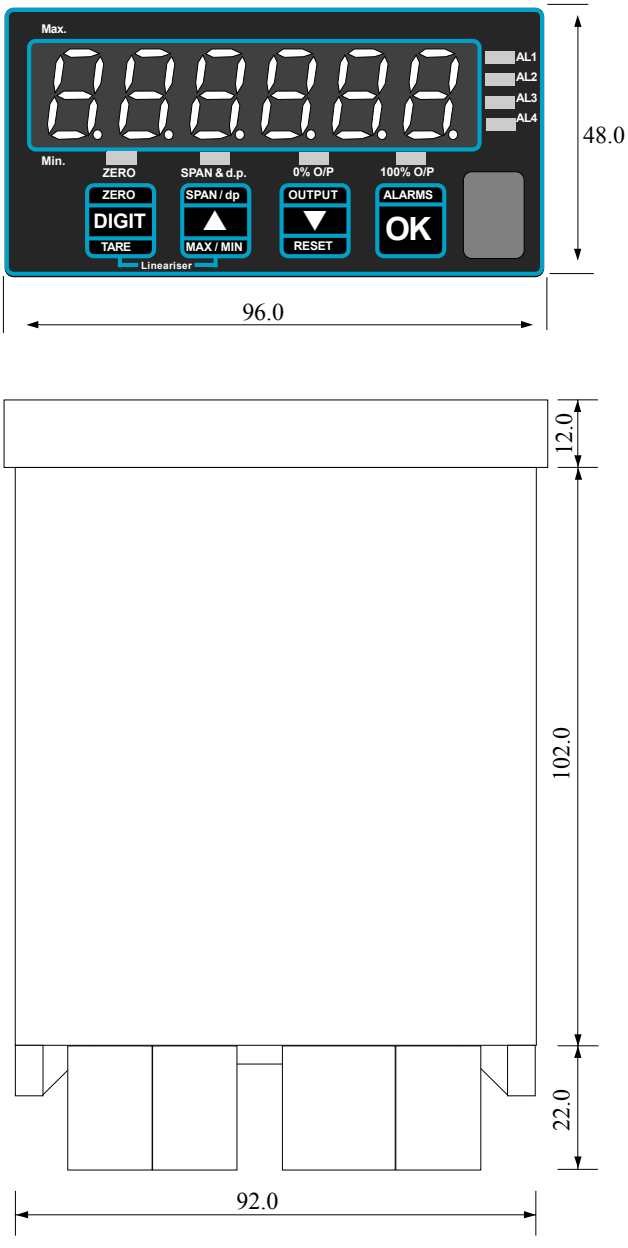
Plug-In Output Options

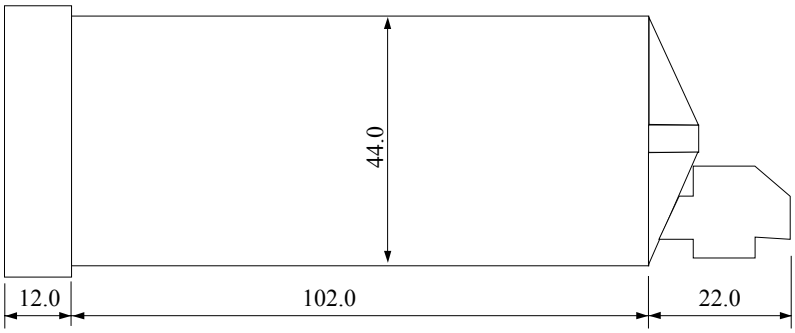
Alarm Relay O/P	2 or 4 alarms SPST rated 5 Amperes at 250 VAC, resistive load. Selectable normally open or normally closed. Selectable energise or de-energise on trip. Alarms relate to the accumulated total or batch subtotal (alarms 2 and 4, which activate for 100mS) at up to 5 pulses per second.
Relay life	Contact life: Greater than 10^6 operations at less than 1A 250V switching, rising to 10^7 operations at 10mA switching. Resistive loads only.
	Mechanical life: 30 x 10^6 operations

Record of Revisions/Changes

.31 July 2003	Released

Notes


Max.
AL1
AL2
AL3
AL4
Min.
ZERO
SPAN & d.p.
0% O/P
100% O/P
ZERO
DIGIT
TARE
SPAN / dp
MAX / MIN
OUTPUT
RESET
ALARMS
OK
Lineariser
48.0
96.0
12.0
102.0
22.0
92.0


44.0
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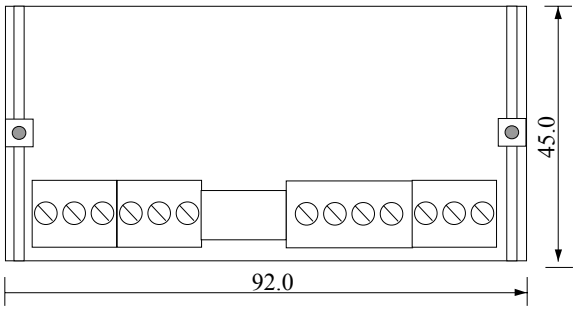
45.0
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Declaration of Conformity

Declaration Reference : INTUITIVE
Issue Date : 9 October 1998 revised 31 July 2003
Products Covered : INTUITIVE series
Title : DOC-INTUITIVE

This is to confirm that the Product covered by this declaration have been designed and manufactured to meet the limits of the following EMC Standard :

EN61326-1:1997

and has been designed to meet the applicable sections of the following safety standards

EN61010-1:2001

Conditions

The meters are permitted a worst case error of 1% of A/D range during electro-magnetic disturbance, and must recover automatically when disturbance ceases without the need for human intervention, such as resetting, power-down etc.

The meters covered by this certificate must be installed in adherence to the following conditions :-

Signal cabling shall be routed separately to power carrying cabling (includes relay output wiring)
All signal cabling shall be screened. The screen shall only be terminated to the power earth terminal