

Operating Instruction
for
Industrial Batching System,
Counter and Flow Indicator
for Panel Mounting

Model: DAG-AXV



MODEL DAG-AXV – 1/8 DIN ANALOG INPUT PANEL METERS



- PROCESS, VOLTAGE, CURRENT, TEMPERATURE, AND STRAIN GAGE INPUTS
- 5-DIGIT 0.56" RED SUNLIGHT READABLE DISPLAY
- VARIABLE INTENSITY DISPLAY
- 16 POINT SCALING FOR NON-LINEAR PROCESSES
- PROGRAMMABLE FUNCTION KEYS/USER INPUTS
- 9 DIGIT TOTALIZER (INTEGRATOR) WITH BATCHING
- OPTIONAL CUSTOM UNITS OVERLAY W/BACKLIGHT
- FOUR SETPOINT ALARM OUTPUTS (W/OPTION CARD)
- COMMUNICATION AND BUS CAPABILITIES (W/OPTION CARD)
- RETRANSMITTED ANALOG OUTPUT (W/OPTION CARD)
- PC SOFTWARE AVAILABLE FOR METER CONFIGURATION
- NEMA 4X/IP65 SEALED FRONT BEZEL

GENERAL DESCRIPTION

The DAG-AXV Analog Panel Meters offer many features and performance capabilities to suit a wide range of industrial applications. Available in five different models to handle various analog inputs, including DC Voltage/Current, AC Voltage/Current, Process, Temperature, and Strain Gage Inputs. Refer to pages 4 through 6 for the details on the specific models. The optional plug-in output cards allow the opportunity to configure the meter for present applications, while providing easy upgrades for future needs.

The meters employ a bright 0.56" LED display. The unit is available with a red sunlight readable or a standard green LED. The intensity of display can be adjusted from dark room applications up to sunlight readable, making it ideal for viewing in bright light applications.

The meters provide a MAX and MIN reading memory with programmable capture time. The capture time is used to prevent detection of false max or min readings which may occur during start-up or unusual process events.

The signal totalizer (integrator) can be used to compute a time-input product. This can be used to provide a readout of totalized flow, calculate service intervals of motors or pumps, etc. The totalizer can also accumulate batch weighing operations.

The meters have four setpoint outputs, implemented on Plug-in option cards. The Plug-in cards provide dual FORM-C relays (5A), quad FORM-A (3A), or either quad sinking or quad sourcing open collector logic outputs. The setpoint alarms can be configured to suit a variety of control and alarm requirements.

Communication and Bus Capabilities are also available as option cards. These include RS232, RS485, Modbus, DeviceNet, and Profibus-DP. Readout values and setpoint alarm values can be controlled through the bus. Additionally, the meters have a feature that allows a remote computer to directly control the outputs of the meter. With an RS232 or RS485 card installed, it is possible to configure the meter using a Windows® based program. The configuration data can be saved to a file for later recall.

A linear DC output signal is available as an optional Plug-in card. The card provides either 20 mA or 10 V signals. The output can be scaled independent of the input range and can track either the input, totalizer, max or min readings.

Once the meters have been initially configured, the parameter list may be locked out from further modification in its entirety or only the setpoint values can be made accessible.

The meters have been specifically designed for harsh industrial environments. With NEMA 4X/IP65 sealed bezel and extensive testing of noise effects to CE requirements, the meter provides a tough yet reliable application solution.

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 manufacturer, the protection provided by the equipment may be impaired.

Do not use this unit to 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.



CAUTION: Read complete instructions prior to installation and operation of the unit.



CAUTION: Risk of electric shock.

DIMENSIONS In inches (mm)

Note: Recommended minimum clearance (behind the panel) for mounting clip installation is 2.1" (53.4) H x 5.0" (127) W.

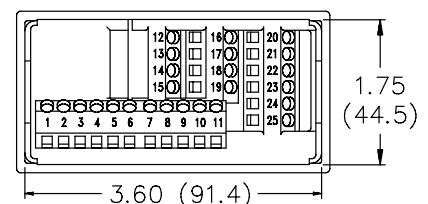
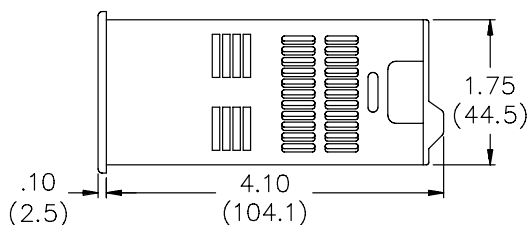
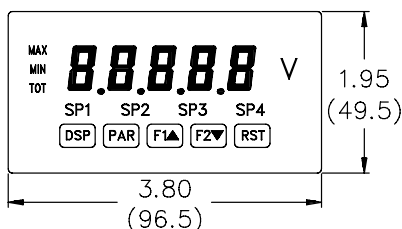


TABLE OF CONTENTS

Ordering Information	2	Wiring the Meter	7
General Meter Specifications	3	Reviewing the Front Buttons and Display . . .	9
Process Input Panel Meter	4	Programming the Meter	10
Optional Plug-In Cards	5	Factory Service Operations	19
Installing the Meter	6	Programming Overview	21
Setting the Jumpers	6		

ORDERING INFORMATION

Model	Description	Supply	Limit values	Output	Interface
DAG-AXV	Normal signal display 5-digit, 14 mm high LED display, totalizing MIN/MAX memory 16-step linearization	0= 85-250 VAC 1= 11-36 VDC, 24	0= without 2= 2 changeover contacts 4= 4 N/O contacts 8= 4 transistor outputs NPN 9= 4 transistor outputs PNP	0= without 4= 0(4)-20 mA, 0-10 V	0= without 7= RS 232 8= RS 485 9= Device-NET

Manufactured and sold by:

Kobold Messring GmbH
Nordring 22-24
D-65719 Hofheim
Tel.: +49(0)6192-2990
Fax: +49(0)6192-23398
E-Mail: info.de@kobold.com
Internet: www.kobold.com

Version: 03/04

GENERAL METER SPECIFICATIONS

1. **DISPLAY:** 5 digit, 0.56" (14.2 mm) red sunlight readable or standard green LEDs, (-19999 to 99999)
2. **POWER:**
 - AC Versions:
 - AC Power: 85 to 250 VAC, 50/60 Hz, 15 VA
 - Isolation: 2300 Vrms for 1 min. to all inputs and outputs.
 - DC Versions
 - DC Power: 11 to 36 VDC, 11 W
 - (derate operating temperature to 40° C if operating <15 VDC and three plug-in option cards are installed)
 - AC Power: 24 VAC, $\pm 10\%$, 50/60 Hz, 15 VA
 - Isolation: 500 Vrms for 1 min. to all inputs and outputs (50 V working).
3. **ANNUNCIATORS:**
 - MAX - maximum readout selected
 - MIN - minimum readout selected
 - TOT - totalizer readout selected, flashes when total overflows
 - SP1 - setpoint alarm 1 is active
 - SP2 - setpoint alarm 2 is active
 - SP3 - setpoint alarm 3 is active
 - SP4 - setpoint alarm 4 is active
 - Units Label - optional units label backlight
4. **KEYPAD:** 3 programmable function keys, 5 keys total
5. **A/D CONVERTER:** 16 bit resolution
6. **UPDATE RATES:**
 - A/D conversion rate: 20 readings/sec.
 - Step response: 200 msec. max. to within 99% of final readout value (digital filter and internal zero correction disabled)
 - 700 msec. max. (digital filter disabled, internal zero correction enabled)

Display update rate: 1 to 20 updates/sec.
 Setpoint output on/off delay time: 0 to 3275 sec.
 Analog output update rate: 0 to 10 sec
 Max./Min. capture delay time: 0 to 3275 sec.

7. **DISPLAY MESSAGES:**
 - "OLOL" - Appears when measurement exceeds + signal range.
 - "ULUL" - Appears when measurement exceeds - signal range

"..." - Appears when display values exceed + display range.
 "-..." - Appears when display values exceed - display range.

8. **INPUT CAPABILITIES:** See specific product specifications, pages 4-6
9. **EXCITATION POWER:** See specific product specifications, pages 4-6
10. **LOW FREQUENCY NOISE REJECTION:**
 - Normal Mode: > 60 dB @ 50 or 60 Hz $\pm 1\%$, digital filter off
 - Common Mode: >100 dB, DC to 120 Hz
11. **USER INPUTS:** Three programmable user inputs
 - Max. Continuous Input: 30 VDC
 - Isolation To Sensor Input Common: Not isolated.

Response Time: 50 msec. max.
 Logic State: Jumper selectable for sink/source logic

INPUT STATE	SINKING INPUTS 22 K Ω pull-up to +5 V	SOURCING INPUTS 22 K Ω pull-down
Active	$V_{IN} < 0.9$ VDC	$V_{IN} > 3.6$ VDC
Inactive	$V_{IN} > 3.6$ VDC	$V_{IN} < 0.9$ VDC

12. **TOTALIZER:**
 - Function:
 - Time Base: second, minute, hour, or day
 - Batch: Can accumulate (gate) input display from a user input
 - Time Accuracy: 0.01% typical
 - Decimal Point: 0 to 0.0000
 - Scale Factor: 0.001 to 65.000
 - Low Signal Cut-out: -19,999 to 99,999
 - Total: 9 digits, display alternates between high order and low order readouts

13. **CUSTOM LINEARIZATION:**
 - Data Point Pairs: Selectable from 2 to 16
 - Display Range: -19,999 to 99,999
 - Decimal Point: 0 to 0.0000
14. **MEMORY:** Nonvolatile E²PROM retains all programmable parameters and display values.
15. **ENVIRONMENTAL CONDITIONS:**
 - Operating Temperature Range: 0 to 50°C (0 to 45°C with all three plug-in cards installed)
 - Storage Temperature Range: -40 to 60°C
 - Operating and Storage Humidity: 0 to 85% max. RH non-condensing
 - Altitude: Up to 2000 meters
16. **CERTIFICATIONS AND COMPLIANCES:**
 - SAFETY**
 - UL Recognized Component, File #E179259, UL3101-1, CSA C22.2 No. 1010-1

Recognized to U.S. and Canadian requirements under the Component Recognition Program of Underwriters Laboratories, Inc.
 UL Listed, File # E137808, UL508, CSA C22.2 No. 14-M95
 LISTED by Und. Lab. Inc. to U.S. and Canadian safety standards
 Type 4X Enclosure rating (Face only), UL50
 IECEE CB Scheme Test Certificate #UL/5854B/UL
 CB Scheme Test Report #02ME04503-04122002
 Issued by Underwriters Laboratories, Inc.
 IEC 1010-1, EN 61010-1: Safety requirements for electrical equipment for measurement, control, and laboratory use, Part I
 IP65 Enclosure rating (Face only), IEC 529
 IP20 Enclosure rating (Rear of unit), IEC 529

ELECTROMAGNETIC COMPATIBILITY

Immunity to EN 50082-2

Electrostatic discharge	EN 61000-4-2	Level 2; 4 Kv contact Level 3; 8 Kv air
Electromagnetic RF fields	EN 61000-4-3	Level 3; 10 V/m ¹ 80 MHz - 1 GHz
Fast transients (burst)	EN 61000-4-4	Level 4; 2 Kv I/O Level 3; 2 Kv power
RF conducted interference	EN 61000-4-6	Level 3; 10 V/rms 150 KHz - 80 MHz
Simulation of cordless telephones	ENV 50204	Level 3; 10 V/m 900 MHz ± 5 MHz 200 Hz, 50% duty cycle

Emissions to EN 50081-2

RF interference	EN 55011	Enclosure class A Power mains class A
-----------------	----------	--

Notes:

1. *Self-recoverable loss of performance during EMI disturbance at 10 V/m: Measurement input and/or analog output signal may deviate during EMI disturbance.*

For operation without loss of performance:

*Unit is mounted in a metal enclosure (Buckeye SM7013-0 or equivalent)
 I/O and power cables are routed in metal conduit connected to earth ground.*

Refer to EMC Installation Guidelines section of the bulletin for additional information.

17. **CONNECTIONS:** High compression cage-clamp terminal block
 - Wire Strip Length: 0.3" (7.5 mm)
 - Wire Gauge: 30-14 AWG copper wire
 - Torque: 4.5 inch-lbs (0.51 N-m) max.
18. **CONSTRUCTION:** This unit is rated for NEMA 4X/IP65 indoor use. IP20 Touch safe. Installation Category II, Pollution Degree 2. One piece bezel/case. Flame resistant. Synthetic rubber keypad. Panel gasket and mounting clip included.
19. **WEIGHT:** 10.4 oz. (295 g)

MODEL **DAG-AXV** - PROCESS INPUT

DAG-AXV SPECIFICATIONS

SENSOR INPUTS:

INPUT (RANGE)	ACCURACY* (18 to 28°C)	ACCURACY* (0 to 50°C)	IMPEDANCE/ COMPLIANCE	MAX CONTINUOUS OVERLOAD	DISPLAY RESOLUTION
20 mA (-2 to 26 mA)	0.03% of reading +2 µA	0.12% of reading +3 µA	20 ohm	150 mA	1 µA
10 VDC (-1 to 13 VDC)	0.03% of reading +2 mV	0.12% of reading +3 mV	500 Kohm	300 V	1 mV

* After 20 minute warm-up. Accuracy is specified in two ways: Accuracy over an 18 to 28°C and 10 to 75% RH environment; and accuracy over a 0 to 50°C and 0 to 85%RH (non-condensing environment). Accuracy over the 0 to 50°C range includes the temperature coefficient effect of the meter.

EXCITATION POWER:

Transmitter Power: 24 VDC, ±5%, regulated, 50 mA max.

- *DUAL RANGE INPUT (20 mA or 10 VDC)*
- *24 VDC TRANSMITTER POWER*

OPTIONAL PLUG-IN OUTPUT CARDS



WARNING: Disconnect all power to the unit before installing Plug-in cards.

Adding Option Cards

The DAG-AXV can be fitted with up to three optional plug-in cards. The details for each plug-in card can be reviewed in the specification section below. Only one card from each function type can be installed at one time. The function types include Setpoint Alarms, Communications, and Analog Output. The plug-in cards can be installed initially or at a later date.

COMMUNICATION CARDS

A variety of communication protocols are available for the DAG series. Only one of these cards can be installed at a time. When programming the unit via RLCPro, a Windows® based program, the RS232 or RS485 Cards must be used.

DAGCDC10 - RS485 Serial	DAGCDC40 - Modbus
DAGCDC20 - RS232 Serial	DAGCDC50 - Profibus-DP
DAGCDC30 - DeviceNet	

SERIAL COMMUNICATIONS CARD

Type: RS485 or RS232

Isolation To Sensor & User Input Commons: 500 Vrms for 1 min.

Working Voltage: 50 V. Not Isolated from all other commons.

Data: 7/8 bits

Baud: 300 to 19,200

Parity: no, odd or even

Bus Address: Selectable 0 to 99, Max. 32 meters per line (RS485)

Transmit Delay: Selectable for 2 to 50 msec or 50 to 100 msec (RS485)

DEVICENET™ CARD

Compatibility: Group 2 Server Only, not UCMM capable

Baud Rates: 125 Kbaud, 250 Kbaud, and 500 Kbaud

Bus Interface: Phillips 82C250 or equivalent with MIS wiring protection per DeviceNet™ Volume I Section 10.2.2.

Node Isolation: Bus powered, isolated node

Host Isolation: 500 Vrms for 1 minute (50 V working) between DeviceNet™ and meter input common.

MODBUS CARD

Type: RS485; RTU and ASCII MODBUS modes

Isolation To Sensor & User Input Commons: 500 Vrms for 1 minute.

Working Voltage: 50 V. Not isolated from all other commons.

Baud Rates: 300 to 38400.

Data: 7/8 bits

Parity: No, Odd, or Even

Addresses: 1 to 247.

Transmit Delay: Programmable; See Transmit Delay explanation.

PROFIBUS-DP CARD

Fieldbus Type: Profibus-DP as per EN 50170, implemented with Siemens SPC3 ASIC

Conformance: PNO Certified Profibus-DP Slave Device

Baud Rates: Automatic baud rate detection in the range 9.6 Kbaud to 12 Mbaud
Station Address: 0 to 126, set by the master over the network. Address stored in non-volatile memory.

Connection: 9-pin Female D-Sub connector

Network Isolation: 500 Vrms for 1 minute (50 V working) between Profibus network and sensor and user input commons. Not isolated from all other commons.

PROGRAMMING SOFTWARE

The DAG software is a Windows® based program that allows configuration of the DAG meter from a PC. Using the software makes it easier to program the DAG meter and allows saving the DAG program in a PC file for future use. On-line help is available within the software. A DAG serial plug-in card is required to program the meter using the software.

SETPOINT CARDS

The DAG-AXV series has 4 available setpoint alarm output plug-in cards. Only one of these cards can be installed at a time. (Logic state of the outputs can be reversed in the programming.) These plug-in cards include:

DAGCDS10 - Dual Relay, FORM-C, Normally open & closed

DAGCDS20 - Quad Relay, FORM-A, Normally open only

DAGCDS30 - Isolated quad sinking NPN open collector

DAGCDS40 - Isolated quad sourcing PNP open collector

DUAL RELAY CARD

Type: Two FORM-C relays

Isolation To Sensor & User Input Commons: 2000 Vrms for 1 min.

Working Voltage: 240 Vrms

Contact Rating:

One Relay Energized: 5 amps @ 120/240 VAC or 28 VDC (resistive load), 1/8 HP @ 120 VAC, inductive load

Total current with both relays energized not to exceed 5 amps

Life Expectancy: 100 K cycles min. at full load rating. External RC snubber extends relay life for operation with inductive loads

QUAD RELAY CARD

Type: Four FORM-A relays

Isolation To Sensor & User Input Commons: 2300 Vrms for 1 min.

Working Voltage: 250 Vrms

Contact Rating:

One Relay Energized: 3 amps @ 240 VAC or 30 VDC (resistive load), 1/10 HP @ 120 VAC, inductive load

Total current with all four relays energized not to exceed 4 amps

Life Expectancy: 100K cycles min. at full load rating. External RC snubber extends relay life for operation with inductive loads

QUAD SINKING OPEN COLLECTOR CARD

Type: Four isolated sinking NPN transistors.

Isolation To Sensor & User Input Commons: 500 Vrms for 1 min.

Working Voltage: 50 V. Not Isolated from all other commons.

Rating: 100 mA max @ $V_{SAT} = 0.7$ V max. $V_{MAX} = 30$ V

QUAD SOURCING OPEN COLLECTOR CARD

Type: Four isolated sourcing PNP transistors.

Isolation To Sensor & User Input Commons: 500 Vrms for 1 min.

Working Voltage: 50 V. Not Isolated from all other commons.

Rating: Internal supply: 24 VDC $\pm 10\%$, 30 mA max. total
External supply: 30 VDC max., 100 mA max. each output

ALL FOUR SETPOINT CARDS

Response Time: 200 msec. max. to within 99% of final readout value (digital filter and internal zero correction disabled)

700 msec. max. (digital filter disabled, internal zero correction enabled)

LINEAR DC OUTPUT

Either a 0(4)-20 mA or 0-10 V retransmitted linear DC output is available from the analog output plug-in card. The programmable output low and high scaling can be based on various display values. Reverse slope output is possible by reversing the scaling point positions.

DAGCDL10 - Retransmitted Analog Output Card

ANALOG OUTPUT CARD

Types: 0 to 20 mA, 4 to 20 mA or 0 to 10 VDC

Isolation To Sensor & User Input Commons: 500 Vrms for 1 min.

Working Voltage: 50 V. Not Isolated from all other commons.

Accuracy: 0.17% of FS (18 to 28°C); 0.4% of FS (0 to 50°C)

Resolution: 1/3500

Compliance: 10 VDC: 10 K Ω load min., 20 mA: 500 Ω load max.

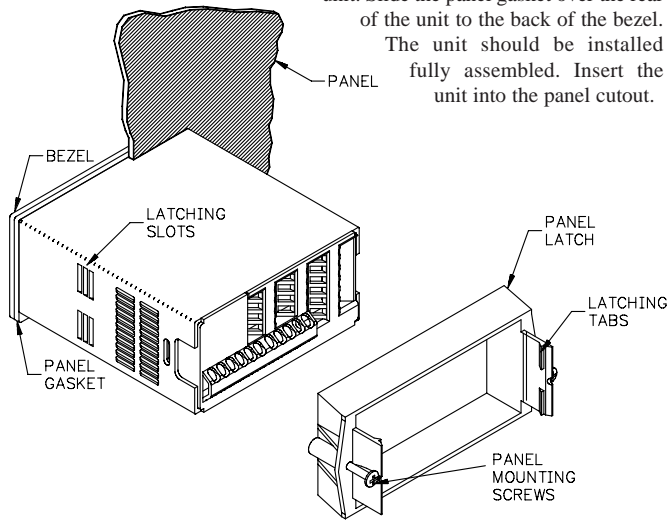
Update time: 200 msec. max. to within 99% of final output value (digital filter and internal zero correction disabled)

700 msec. max. (digital filter disabled, internal zero correction enabled)

1.0 INSTALLING THE METER

Installation

The DAG meets NEMA 4X/IP65 requirements for indoor use when properly installed. The unit is intended to be mounted into an enclosed panel. Prepare the panel cutout to the dimensions shown. Remove the panel latch from the unit. Slide the panel gasket over the rear of the unit to the back of the bezel. The unit should be installed fully assembled. Insert the unit into the panel cutout.



While holding the unit in place, push the panel latch over the rear of the unit so that the tabs of the panel latch engage in the slots on the case. The panel latch should be engaged in the farthest forward slot possible. To achieve a proper seal, tighten the latch screws evenly until the unit is snug in the panel (Torque to approximately 7 in-lbs [79N-cm]). Do not over-tighten the screws.

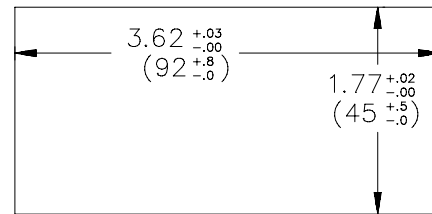
Installation Environment

The unit should be installed in a location that does not exceed the maximum operating temperature and provides good air circulation. Placing the unit near devices that generate excessive heat should be avoided.

The bezel should be cleaned only with a soft cloth and neutral soap product. Do NOT use solvents. Continuous exposure to direct sunlight may accelerate the aging process of the bezel.

Do not use tools of any kind (screwdrivers, pens, pencils, etc.) to operate the keypad of the unit.

PANEL CUT-OUT



2.0 SETTING THE JUMPERS

The meter can have up to four jumpers that must be checked and / or changed prior to applying power. The following Jumper Selection Figures show an enlargement of the jumper area.

To access the jumpers, remove the meter base from the case by firmly squeezing and pulling back on the side rear finger tabs. This should lower the latch below the case slot (which is located just in front of the finger tabs). It is recommended to release the latch on one side, then start the other side latch.

Input Range Jumper

This jumper is used to select the proper input range. The input range selected in programming must match the jumper setting. Select a range that is high enough to accommodate the maximum input to avoid overloads. The selection is different for each meter. See the Jumper Selection Figure for appropriate meter.

Excitation Output Jumper

If your meter has excitation, this jumper is used to select the excitation range for the application. If excitation is not being used, it is not necessary to check or move this jumper.

User Input Logic Jumper

This jumper selects the logic state of all the user inputs. If the user inputs are not used, it is not necessary to check or move this jumper.

DAG-AXV Jumper Selection

JUMPER SELECTIONS

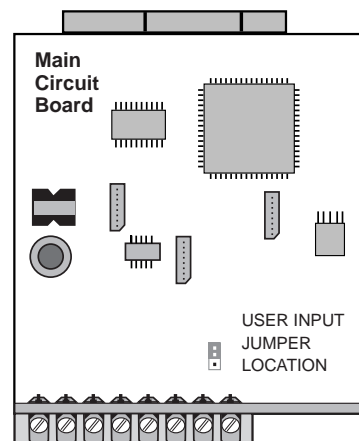
The \nearrow indicates factory setting.

USER INPUT LOGIC JUMPER

\nearrow SINK

\square SOURCE

↓ REAR TERMINALS ↓



3.0 WIRING THE METER

WIRING OVERVIEW

Electrical connections are made via screw-clamp terminals located on the back of the meter. All conductors should conform to the meter's voltage and current ratings. All cabling should conform to appropriate standards of good installation, local codes and regulations. It is recommended that power supplied to the meter (DC or AC) be protected by a fuse or circuit breaker.

When wiring the meter, compare the numbers embossed on the back of the meter case against those shown in wiring drawings for proper wire position. Strip the wire, leaving approximately 0.3" (7.5 mm) bare lead exposed (stranded wires should be tinned with solder). Insert the lead under the correct screw-clamp terminal and tighten until the wire is secure. (Pull wire to verify tightness.) Each terminal can accept up to one #14 AWG (2.55 mm) wire, two #18 AWG (1.02 mm), or four #20 AWG (0.61 mm).

EMC INSTALLATION GUIDELINES

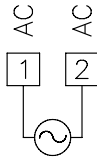
Although this meter is designed with a high degree of immunity to Electro-Magnetic Interference (EMI), proper installation and wiring methods must be followed to ensure compatibility in each application. The type of the electrical noise, its source or the method of coupling into the unit may be different for various installations. Listed below are some EMC guidelines for successful installation in an industrial environment.

1. The meter should be mounted in a metal enclosure, which is properly connected to protective earth.
2. With use of the lower input ranges or signal sources with high source impedance, the use of shielded cable may be necessary. This helps to guard against stray AC pick-up. Attach the shield to the input common of the meter. Line voltage monitoring and 5A CT applications do not usually require shielding.
3. To minimize potential noise problems, power the meter from the same power branch, or at least the same phase voltage as that of the signal source.
4. Never run Signal or Control cables in the same conduit or raceway with AC power lines, conductors feeding motors, solenoids, SCR controls, and heaters, etc. The cables should be run in metal conduit that is properly grounded. This is especially useful in applications where cable runs are long and portable two-way radios are used in close proximity or if the installation is near a commercial radio transmitter.
5. Signal or Control cables within an enclosure should be routed as far away as possible from contactors, control relays, transformers, and other noisy components.
6. In extremely high EMI environments, the use of external EMI suppression devices, such as ferrite suppression cores, is effective. Install them on Signal and Control cables as close to the unit as possible. Loop the cable through the core several times or use multiple cores on each cable for additional protection. Install line filters on the power input cable to the unit to suppress power line interference. Install them near the power entry point of the enclosure. The following EMI suppression devices (or equivalent) are recommended:
 - Ferrite Suppression Cores for signal and control cables:
 - Fair-Rite # 0443167251 (RLC #FCOR0000)
 - TDK # ZCAT3035-1330A
 - Steward #28B2029-0A0
 - Line Filters for input power cables:
 - Schaffner # FN610-1/07 (RLC #LFIL0000)
 - Schaffner # FN670-1.8/07
 - Corcom #1VR3*Note: Reference manufacturer's instructions when installing a line filter.*
7. Long cable runs are more susceptible to EMI pickup than short cable runs. Therefore, keep cable runs as short as possible.
8. Switching of inductive loads produces high EMI. Use of snubbers across inductive loads suppresses EMI.
 - Snubber: RLC#SNUB0000.

3.1 POWER WIRING

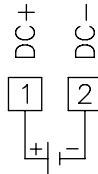
AC Power

Terminal 1: VAC
Terminal 2: VAC



DC Power

Terminal 1: +VDC
Terminal 2: -VDC

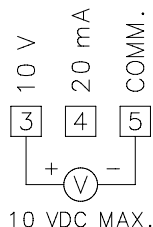


3.2 INPUT SIGNAL WIRING

DAG-AXV - INPUT SIGNAL WIRING

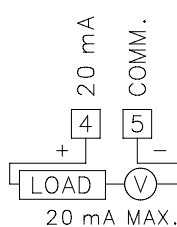
Voltage Signal (self powered)

Terminal 3: +VDC
Terminal 5: -VDC



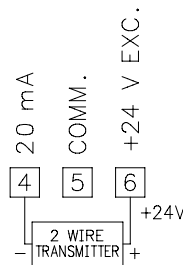
Current Signal (self powered)

Terminal 4: +ADC
Terminal 5: -ADC



Current Signal (2 wire requiring excitation)

Terminal 4: -ADC
Terminal 6: +ADC

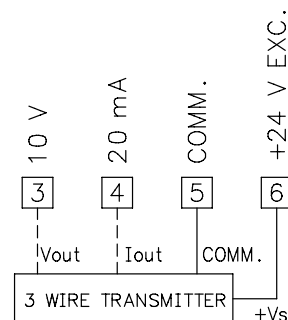


Current Signal (3 wire requiring excitation)

Terminal 4: +ADC (signal)
Terminal 5: -ADC (common)
Terminal 6: +VOLT supply

Voltage Signal (3 wire requiring excitation)

Terminal 3: +VDC (signal)
Terminal 5: -VDC (common)
Terminal 6: +VOLT supply



CAUTION: Sensor input common is NOT isolated from user input common. In order to preserve the safety of the meter application, the sensor input common must be suitably isolated from hazardous live earth referenced voltages; or input common must be at protective earth ground potential. If not, hazardous live voltage may be present at the User Inputs and User Input Common terminals. Appropriate considerations must then be given to the potential of the user input common with respect to earth common; and the common of the isolated plug-in cards with respect to input common.

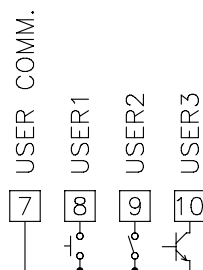
3.3 USER INPUT WIRING

Before connecting the wires, the User Input Logic Jumper should be verified for proper position. If not using User Inputs, then skip this section. Only the appropriate User Input terminal has to be wired.

Sinking Logic

Terminal 8-10: } Connect external switching device between
Terminal 7: } appropriate User Input terminal and User Comm.

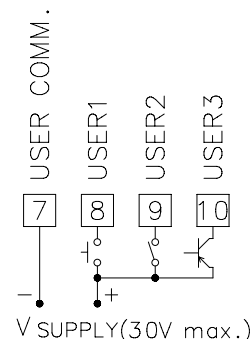
In this logic, the user inputs of the meter are internally pulled up to +5 V with 22 K resistance. The input is active when it is pulled low (<0.9 V).



Sourcing Logic

Terminal 8-10: + VDC thru external switching device
Terminal 7: -VDC thru external switching device

In this logic, the user inputs of the meter are internally pulled down to 0 V with 22 K resistance. The input is active when a voltage greater than 3.6 VDC is applied.



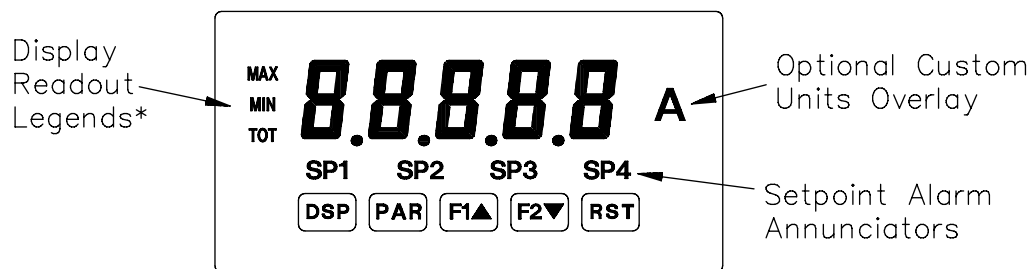
3.4 SETPOINT (ALARMS) WIRING

3.5 SERIAL COMMUNICATION WIRING

3.6 ANALOG OUTPUT WIRING

See appropriate plug-in card bulletin for details.

4.0 REVIEWING THE FRONT BUTTONS AND DISPLAY



KEY DISPLAY MODE OPERATION

DSP Index display through max/min/total/input readouts

PAR Access parameter list

F1▲ Function key 1; hold for 3 seconds for Second Function 1**

F2▼ Function key 2; hold for 3 seconds for Second Function 2**

RST Reset (Function key)**

PROGRAMMING MODE OPERATION

Quit programming and return to display mode

Store selected parameter and index to next parameter

Increment selected parameter value

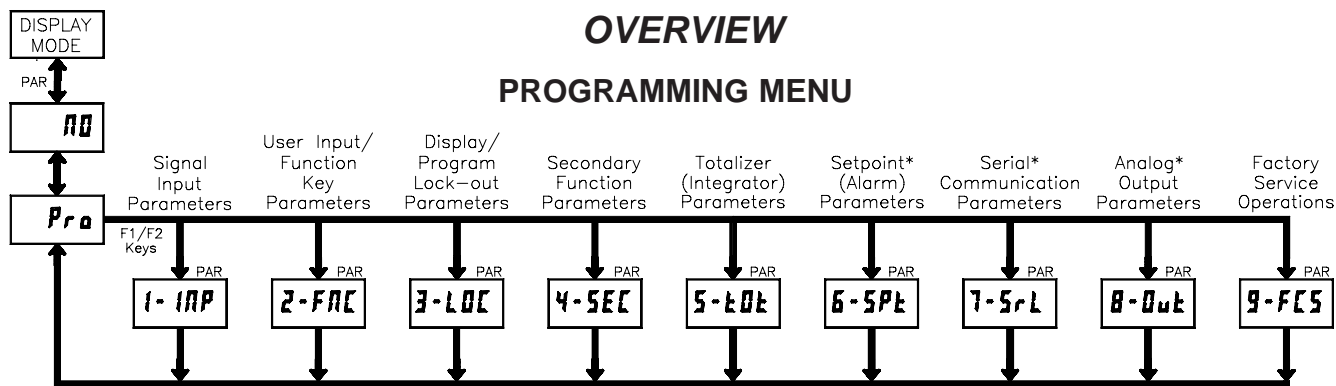
Decrement selected parameter value

Hold with F1▲, F2▼ to scroll value by x1000

* Display Readout Legends may be locked out in Factory Settings.

** Factory setting for the F1, F2, and RST keys is NO mode.

5.0 PROGRAMMING THE METER



DISPLAY MODE

The meter normally operates in the Display Mode. In this mode, the meter displays can be viewed consecutively by pressing the **DSP** key. The annunciators to the left of the display indicate which display is currently shown; Max Value (MAX), Min Value (MIN), or Totalizer Value (TOT). Each of these displays can be locked from view through programming. (See Module 3) The Input Display Value is shown with no annunciator.

PROGRAMMING MODE

Two programming modes are available.

Full Programming Mode permits all parameters to be viewed and modified.

Upon entering this mode, the front panel keys change to Programming Mode operations. This mode should not be entered while a process is running, since the meter functions and User Input response may not operate properly while in Full Programming Mode.

Quick Programming Mode permits only certain parameters to be viewed and/or modified. When entering this mode, the front panel keys change to Programming Mode operations, and all meter functions continue to operate properly. Quick Programming Mode is configured in Module 3. The Display Intensity Level “d-LEu” parameter is available in the Quick Programming Mode only when the security code is non-zero. For a description, see Module 9—Factory Service Operations. Throughout this document, Programming Mode (without Quick in front) always refers to “Full” Programming Mode.

PROGRAMMING TIPS

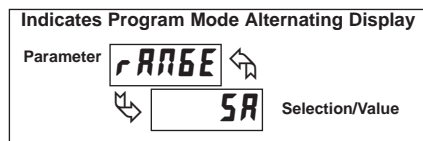
The Programming Menu is organized into nine modules (See above). These modules group together parameters that are related in function. It is recommended to begin programming with Module 1 and proceed through each module in sequence. Note that Modules 6 through 8 are only accessible when the appropriate plug-in option card is installed. If lost or confused while programming, press the **DSP** key to exit programming mode and start over. When programming is complete, it is recommended to record the meter settings on the Parameter Value Chart and lock-out parameter programming with a User Input or lock-out code. (See Modules 2 and 3 for lock-out details.)

FACTORY SETTINGS

Factory Settings may be completely restored in Module 9. This is a good starting point if encountering programming problems. Throughout the module description sections which follow, the factory setting for each parameter is shown below the parameter display. In addition, all factory settings are listed on the Parameter Value Chart following the programming section.

ALTERNATING SELECTION DISPLAY

In the module description sections which follow, the dual display with arrows appears for each programming parameter. This is used to illustrate the display alternating between the parameter (top display) and the parameter's Factory Setting (bottom display). In most cases, selections or value ranges for the parameter will be listed on the right.



STEP BY STEP PROGRAMMING INSTRUCTIONS:

PROGRAMMING MODE ENTRY (PAR KEY)

The Programming Mode is entered by pressing the **PAR** key. If this mode is not accessible, then meter programming is locked by either a security code or a hardware lock. (See Modules 2 and 3 for programming lock-out details.)

MODULE ENTRY (ARROW & PAR KEYS)

Upon entering the Programming Mode, the display alternates between **PrA** and the present module (initially **PrA**). The arrow keys (**F1▲** and **F2▼**) are used to select the desired module, which is then entered by pressing the **PAR** key.

PARAMETER (MODULE) MENU (PAR KEY)

Each module has a separate parameter menu. These menus are shown at the start of each module description section which follows. The **PAR** key is pressed to advance to a particular parameter to be changed, without changing the programming of preceding parameters. After completing a module, the display will return to **PrA**. From this point, programming may continue by selecting and entering additional modules. (See **MODULE ENTRY** above.)

PARAMETER SELECTION ENTRY (ARROW & PAR KEYS)

For each parameter, the display alternates between the parameter and the present selection or value for that parameter. For parameters which have a list of selections, the arrow keys (**F1▲** and **F2▼**) are used to sequence through the list until the desired selection is displayed. Pressing the **PAR** key stores and activates the displayed selection, and also advances the meter to the next parameter.

NUMERICAL VALUE ENTRY (ARROW, RST & PAR KEYS)

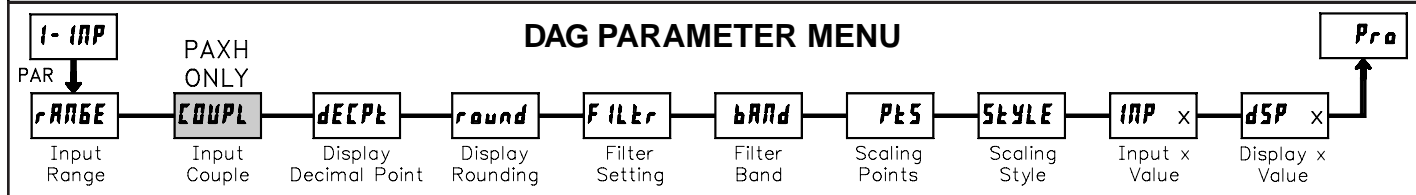
For parameters which require a numerical value entry, the arrow keys can be used to increment or decrement the display to the desired value. When an arrow key is pressed and held, the display automatically scrolls up or scrolls down. The longer the key is held, the faster the display scrolls.

The **RST** key can be used in combination with the arrow keys to enter large numerical values. When the **RST** key is pressed along with an arrow key, the display scrolls by 1000's. Pressing the **PAR** key stores and activates the displayed value, and also advances the meter to the next parameter.

PROGRAMMING MODE EXIT (DSP KEY or PAR KEY at **PrA** **PrA**)

The Programming Mode is exited by pressing the **DSP** key (from anywhere in the Programming Mode) or the **PAR** key (with **PrA** **PrA** displayed). This will commit any stored parameter changes to memory and return the meter to the Display Mode. If a parameter was just changed, the **PAR** key should be pressed to store the change before pressing the **DSP** key. (If power loss occurs before returning to the Display Mode, verify recent parameter changes.)

5.1 MODULE 1 - SIGNAL INPUT PARAMETERS (1- INP)



Refer to the appropriate Input Range for the selected meter. Use only one Input Range, then proceed to Display Decimal Point.

DAG-AXV - INPUT RANGE

RANGE ↩

SELECTION RANGE RESOLUTION

0.02A ±20.000 mA

10V ±10.000 V

Select the input range that corresponds to the external signal.

DISPLAY ROUNDING*

round ↩

1 2 5 100

10 20 50 100

Rounding selections other than one, cause the Input Display to 'round' to the nearest rounding increment selected (ie. rounding of '5' causes 122 to round to 120 and 123 to round to 125). Rounding starts at the least significant digit of the Input Display. Remaining parameter entries (scaling point values, setpoint values, etc.) are not automatically adjusted to this display rounding selection.

FILTER SETTING*

FILTER ↩

0.0 to 25.0 seconds

1.0

The input filter setting is a time constant expressed in tenths of a second. The filter settles to 99% of the final display value within approximately 3 time constants. This is an Adaptive Digital Filter which is designed to steady the Input Display reading. A value of '0' disables filtering.

FILTER BAND*

BAND ↩

0.0 to 25.0 display units

1.0

The digital filter will adapt to variations in the input signal. When the variation exceeds the input filter band value, the digital filter disengages. When the variation becomes less than the band value, the filter engages again. This allows for a stable readout, but permits the display to settle rapidly after a large process change. The value of the band is in display units, independent of the Display Decimal Point position. A band setting of '0' keeps the digital filter permanently engaged.

DISPLAY ROUNDING*

round ↩

1 2 5 100

10 20 50 100

Rounding selections other than one, cause the Input Display to 'round' to the nearest rounding increment selected (ie. rounding of '5' causes 122 to round to 120 and 123 to round to 125). Rounding starts at the least significant digit of the Input Display. Remaining parameter entries (scaling point values, setpoint values, etc.) are not automatically adjusted to this display rounding selection.

FILTER SETTING*

FILTER ↩

0.0 to 25.0 seconds

1.0

The input filter setting is a time constant expressed in tenths of a second. The filter settles to 99% of the final display value within approximately 3 time constants. This is an Adaptive Digital Filter which is designed to steady the Input Display reading. A value of '0' disables filtering.

FILTER BAND*

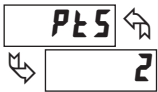
BAND ↩

0.0 to 25.0 display units

1.0

The digital filter will adapt to variations in the input signal. When the variation exceeds the input filter band value, the digital filter disengages. When the variation becomes less than the band value, the filter engages again. This allows for a stable readout, but permits the display to settle rapidly after a large process change. The value of the band is in display units, independent of the Display Decimal Point position. A band setting of '0' keeps the digital filter permanently engaged.

SCALING POINTS*



2 to 15

Linear - Scaling Points (2)

For linear processes, only 2 scaling points are necessary. It is recommended that the 2 scaling points be at opposite ends of the input signal being applied. The points do not have to be the signal limits. Display scaling will be linear between and continue past the entered points up to the limits of the Input Signal Jumper position. Each scaling point has a coordinate-pair of Input Value (**INP**) and an associated desired Display Value (**dSP**).

Nonlinear - Scaling Points (Greater than 2)

For non-linear processes, up to 16 scaling points may be used to provide a piece-wise linear approximation. (The greater the number of scaling points used, the greater the conformity accuracy.) The Input Display will be linear between scaling points that are sequential in program order. Each scaling point has a coordinate-pair of Input Value (**INP**) and an associated desired Display Value (**dSP**). Data from tables or equations, or empirical data could be used to derive the required number of segments and data values for the coordinate pairs. In the DAG-AXV software, several linearization equations are available.

SCALING STYLE



KEY key-in data
APPLY apply signal

If Input Values and corresponding Display Values are known, the Key-in (**KEY**) scaling style can be used. This allows scaling without the presence or changing of the input signal. If Input Values have to be derived from the actual input signal source or simulator, the Apply (**APPLY**) scaling style must be used.

INPUT VALUE FOR SCALING POINT 1



- 19999 to 99999

For Key-in (**KEY**), enter the known first Input Value by using the arrow keys. (The Input Range selection sets up the decimal location for the Input Value). For Apply (**APPLY**), apply the input signal to the meter, adjust the signal source externally until the desired Input Value appears. In either method, press the **PAR** key to enter the value being displayed. The **DSP** key can be pressed without changing the previously stored **INP 1** value in the **APPLY** style.

DISPLAY VALUE FOR SCALING POINT 1



- 19999 to 99999

Enter the first coordinating Display Value by using the arrow keys. This is the same for **KEY** and **APPLY** scaling styles. The decimal point follows the **dECP** selection.

INPUT VALUE FOR SCALING POINT 2



- 19999 to 99999

For Key-in (**KEY**), enter the known second Input Value by using the arrow keys. For Apply (**APPLY**), adjust the signal source externally until the next desired Input Value appears. (Follow the same procedure if using more than 2 scaling points.)

DISPLAY VALUE FOR SCALING POINT 2



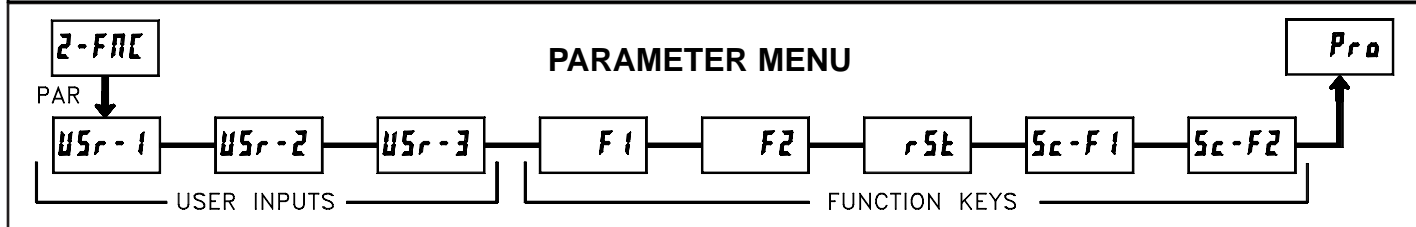
- 19999 to 99999

Enter the second coordinating Display Value by using the arrow keys. This is the same for **KEY** and **APPLY** scaling styles. (Follow the same procedure if using more than 2 scaling points.)

General Notes on Scaling

1. Input Values for scaling points should be confined to the limits of the Input Range Jumper position.
2. The same Input Value should not correspond to more than one Display Value. (Example: 20 mA can not equal 0 and 10.)
This is referred to as read out jumps (vertical scaled segments).
3. The same Display Value can correspond to more than one Input Value. (Example: 0 mA and 20 mA can equal 10.)
This is referred to as readout dead zones (horizontal scaled segments).
4. The maximum scaled Display Value spread between range maximum and minimum is limited to 65,535. For example using +20 mA range the maximum +20 mA can be scaled to is 32,767 with 0 mA being 0 and Display Rounding of 1. (Decimal points are ignored.) The other half of 65,535 is for the lower half of the range 0 to -20 mA even if it is not used. With Display Rounding of 2, +20 mA can be scaled for 65,535 (32,767 x 2) but with even Input Display values shown.
5. For input levels beyond the first programmed Input Value, the meter extends the Display Value by calculating the slope from the first two coordinate pairs (**INP 1** / **dSP 1** & **INP 2** / **dSP 2**). If **INP 1** = 4 mA and **dSP 1** = 0, then 0 mA would be some negative Display Value. This could be prevented by making **INP 1** = 0 mA / **dSP 1** = 0, **INP 2** = 4 mA / **dSP 2** = 0, with **INP 3** = 20 mA / **dSP 3** = the desired high Display Value. The calculations stop at the limits of the Input Range Jumper position.
6. For input levels beyond the last programmed Input Value, the meter extends the Display Value by calculating the slope from the last two sequential coordinate pairs. If three coordinate pair scaling points were entered, then the Display Value calculation would be between **INP 2** / **dSP 2** & **INP 3** / **dSP 3**. The calculations stop at the limits of the Input Range Jumper position.

5.2 MODULE 2 - USER INPUT AND FRONT PANEL FUNCTION KEY PARAMETERS (2-FNC)



The three user inputs are individually programmable to perform specific meter control functions. While in the Display Mode or Program Mode, the function is executed the instant the user input transitions to the active state.

The front panel function keys are also individually programmable to perform specific meter control functions. While in the Display Mode, the primary function is executed the instant the key is pressed. Holding the function key for three seconds executes a secondary function. It is possible to program a secondary function without a primary function.

In most cases, if more than one user input and/or function key is programmed for the same function, the maintained (level trigger) actions will be performed while at least one of those user inputs or function keys are activated. The momentary (edge trigger) actions will be performed every time any of those user inputs or function keys transition to the active state.

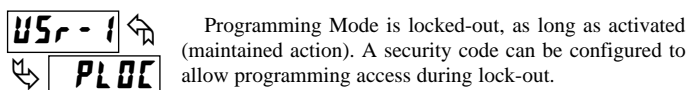
Note: In the following explanations, not all selections are available for both user inputs and front panel function keys. Alternating displays are shown with each selection. Those selections showing both displays are available for both. If a display is not shown, it is not available for that selection. **USr-1** will represent all three user inputs. **F1** will represent all five function keys.

NO FUNCTION



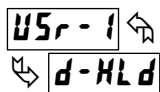
No function is performed if activated. This is the factory setting for all user inputs and function keys. No function can be selected without affecting basic start-up.

PROGRAMMING MODE LOCK-OUT



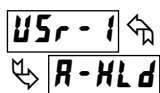
Programming Mode is locked-out, as long as activated (maintained action). A security code can be configured to allow programming access during lock-out.

HOLD DISPLAY



The shown display is held but all other meter functions continue as long as activated (maintained action).

HOLD ALL FUNCTIONS



The meter disables processing the input, holds all display contents, and locks the state of all outputs as long as activated (maintained action). The serial port continues data transfer.

ZERO (TARE) DISPLAY



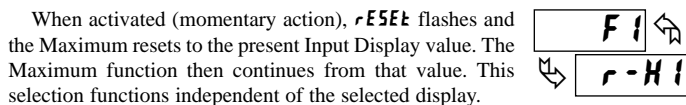
The Zero (Tare) Display provides a way to zero the Input Display value at various input levels, causing future Display readings to be offset. This function is useful in weighing applications where the container or material on the scale should not be included in the next measurement value. When activated (momentary action), **rSEt** flashes and the Display is set to zero. At the same time, the Display value (that was on the display before the Zero Display) is subtracted from the Display Offset Value and is automatically stored as the new Display Offset Value (**OFFSt**). If another Zero (tare) Display is performed, the display will again change to zero and the Display reading will shift accordingly.

RELATIVE/ABSOLUTE DISPLAY



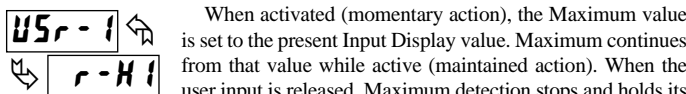
This function will switch the Input Display between Relative and Absolute. The Relative is a net value that includes the Display Offset Value. The Input Display will normally show the Relative unless switched by this function. Regardless of the display selected, all meter functions continue to operate based on relative values. The Absolute is a gross value (based on Module 1 **DSP** and **INP** entries) without the Display Offset Value. The Absolute display is selected as long as the user input is activated (maintained action) or at the transition of the function key (momentary action). When the user input is released, or the function key is pressed again, the input display switches back to Relative display. **AbS** (absolute) or **rEL** (relative) is momentarily displayed at transition to indicate which display is active.

RESET MAXIMUM



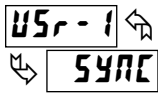
When activated (momentary action), **rSEt** flashes and the Maximum resets to the present Input Display value. The Maximum function then continues from that value. This selection functions independent of the selected display.

RESET, SELECT, ENABLE MAXIMUM DISPLAY



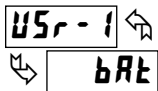
When activated (momentary action), the Maximum value is set to the present Input Display value. Maximum continues from that value while active (maintained action). When the user input is released, Maximum detection stops and holds its value. This selection functions independent of the selected display. The **DSP** key overrides the active user input display but not the Maximum function.

SYNCHRONIZE METER READING



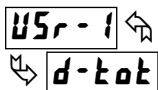
The meter suspends all functions as long as activated (maintained action). When the user input is released, the meter synchronizes the restart of the A/D with other processes or timing events.

STORE BATCH READING IN TOTALIZER



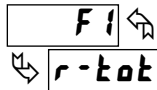
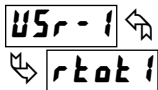
The Input Display value is one time added (batched) to the Totalizer at transition to activate (momentary action). The Totalizer retains a running sum of each batch operation until the Totalizer is reset. When this function is selected, the normal operation of the Totalizer is overridden.

SELECT TOTALIZER DISPLAY



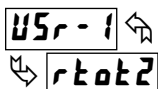
The Totalizer display is selected as long as activated (maintained action). When the user input is released, the Input Display is returned. The **DSP** key overrides the active user input. The Totalizer continues to function including associated outputs independent of being displayed.

RESET TOTALIZER



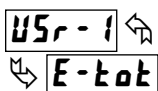
When activated (momentary action), **rESEt** flashes and the Totalizer resets to zero. The Totalizer then continues to operate as it is configured. This selection functions independent of the selected display.

RESET AND ENABLE TOTALIZER



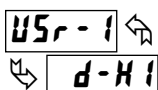
When activated (momentary action), **rESEt** flashes and the Totalizer resets to zero. The Totalizer continues to operate while active (maintained action). When the user input is released, the Totalizer stops and holds its value. This selection functions independent of the selected display.

ENABLE TOTALIZER



The Totalizer continues to operate as long as activated (maintained action). When the user input is released, the Totalizer stops and holds its value. This selection functions independent of the selected display.

SELECT MAXIMUM DISPLAY



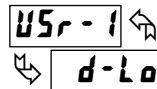
The Maximum display is selected as long as activated (maintained action). When the user input is released, the Input Display returns. The **DSP** key overrides the active user input. The Maximum continues to function independent of being displayed.

SETPOINT SELECTIONS

The following selections are accessible only with the Setpoint plug-in card installed. Refer to the Setpoint Card Bulletin shipped with the Setpoint plug-in card for an explanation of their operation.

Setpoint Card Only	{	L 15t - Select main or alternate setpoints
		r-1 - Reset Setpoint 1 (Alarm 1)
		r-2 - Reset Setpoint 2 (Alarm 2)
		r-3 - Reset Setpoint 3 (Alarm 3)
		r-4 - Reset Setpoint 4 (Alarm 4)
		r-34 - Reset Setpoint 3 & 4 (Alarm 3 & 4)
		r-234 - Reset Setpoint 2, 3 & 4 (Alarm 2, 3 & 4)
		r-ALL - Reset Setpoint All (Alarm All)

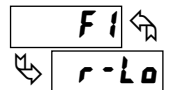
SELECT MINIMUM DISPLAY



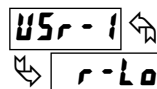
The Minimum display is selected as long as activated (maintained action). When the user input is released, the Input Display is returned. The **DSP** key overrides the active user input. The Minimum continues to function independent of being displayed.

RESET MINIMUM

When activated (momentary action), **rESEt** flashes and the Minimum reading is set to the present Input Display value. The Minimum function then continues from that value. This selection functions independent of the selected display.

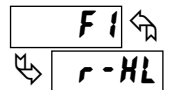
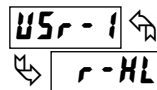


RESET, SELECT, ENABLE MINIMUM DISPLAY



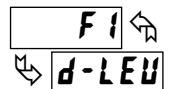
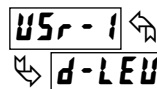
When activated (momentary action), the Minimum value is set to the present Input Display value. Minimum continues from that value while active (maintained action). When the user input is released, Minimum detection stops and holds its value. This selection functions independent of the selected display. The **DSP** key overrides the active user input display but not the Minimum function.

RESET MAXIMUM AND MINIMUM



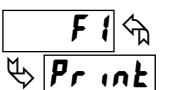
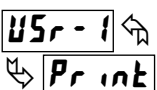
When activated (momentary action), **rESEt** flashes and the Maximum and Minimum readings are set to the present Input Display value. The Maximum and Minimum function then continues from that value. This selection functions independent of the selected display.

CHANGE DISPLAY INTENSITY LEVEL



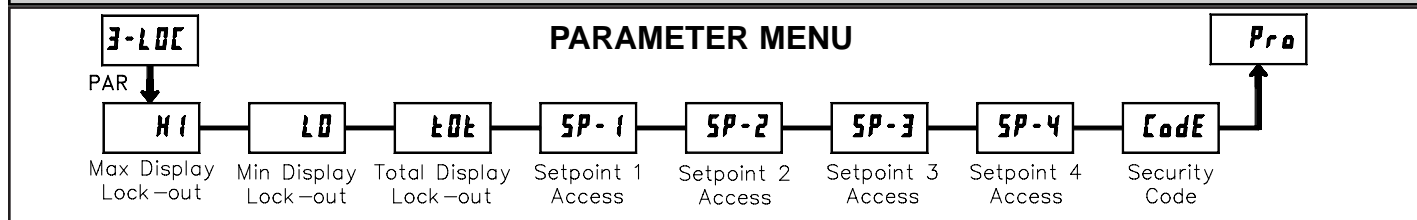
When activated (momentary action), the display intensity changes to the next intensity level (of 4). The four levels correspond to Display Intensity Level (**d-LEU**) settings of 0, 3, 8, and 15. The intensity level, when changed via the User Input/ Function Key, is not retained at power-down, unless Quick Programming or Full Programming mode is entered and exited. The meter will power-up at the last saved intensity level.

PRINT REQUEST



The meter issues a block print through the serial port when activated. The data transmitted during a print request is programmed in Module 7. If the user input is still active after the transmission is complete (about 100 msec), an additional transmission occurs. As long as the user input is held active, continuous transmissions occur.

5.3 MODULE 3 - DISPLAY AND PROGRAM LOCK-OUT PARAMETERS (3-LOC)



Module 3 is the programming for Display lock-out and “Full” and “Quick” Program lock-out.

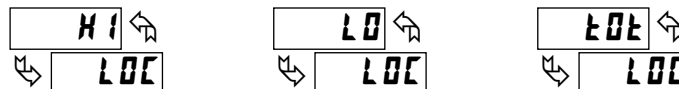
When in the Display Mode, the available displays can be read consecutively by repeatedly pressing the **DSP** key. An annunciator indicates the display being shown. These displays can be locked from being visible. It is recommended that the display be set to **LOC** when the corresponding function is not used.

SELECTION	DESCRIPTION
rEd	Visible in Display Mode
LOC	Not visible in Display Mode

“Full” Programming Mode permits all parameters to be viewed and modified. This Programming Mode can be locked with a security code and/or user input. When locked and the **PAR** key is pressed, the meter enters a Quick Programming Mode. In this mode, the setpoint values can still be read and/or changed per the selections below. The Display Intensity Level (**d-LEU**) parameter also appears whenever Quick Programming Mode is enabled and the security code is greater than zero.

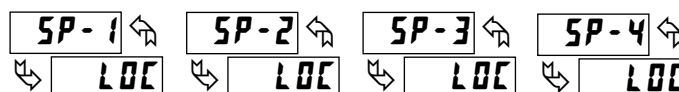
SELECTION	DESCRIPTION
rEd	Visible but not changeable in Quick Programming Mode
ENt	Visible and changeable in Quick Programming Mode
LOC	Not visible in Quick Programming Mode

MAXIMUM DISPLAY LOCK-OUT* MINIMUM DISPLAY LOCK-OUT* TOTALIZER DISPLAY LOCK-OUT*



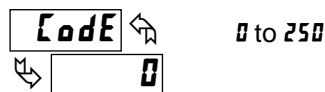
These displays can be programmed for **LOC** or **rEd**. When programmed for **LOC**, the display will not be shown when the **DSP** key is pressed regardless of Program Lock-out status. It is suggested to lock-out the display if it is not needed. The associated function will continue to operate even if its display is locked-out.

SP-1 SP-2 SP-3 SP-4 SETPOINT ACCESS*



The setpoint displays can be programmed for **LOC**, **rEd** or **ENt** (See the following table). Accessible only with the Setpoint plug-in card installed.

PROGRAM MODE SECURITY CODE*



By entering any non-zero value, the prompt **CODE 0** will appear when trying to access the Program Mode. Access will only be allowed after entering a matching security code or universal code of **222**. With this lock-out, a user input would not have to be configured for Program Lock-out. However, this lock-out is overridden by an inactive user input configured for Program Lock-out.

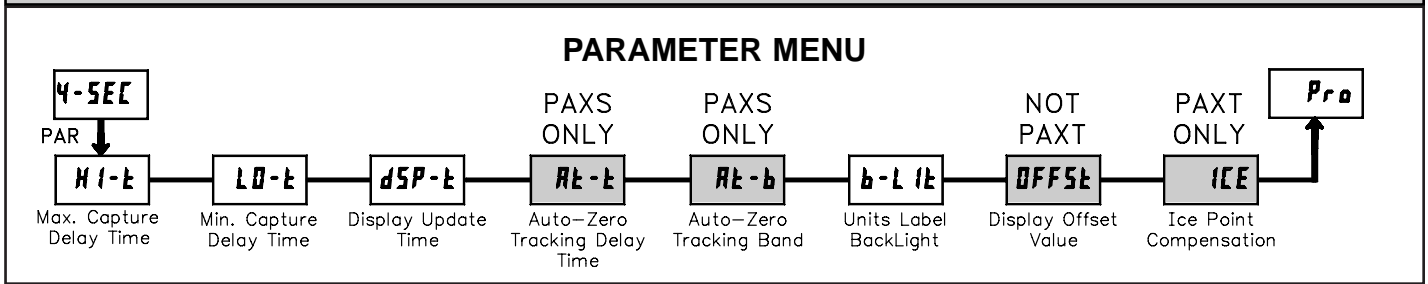
* Factory Setting can be used without affecting basic start-up.

PROGRAMMING MODE ACCESS

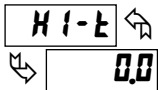
SECURITY CODE	USER INPUT CONFIGURED	USER INPUT STATE	WHEN PAR KEY IS PRESSED	“FULL” PROGRAMMING MODE ACCESS
0	not PL OC	—	“Full” Programming	Immediate access.
>0	not PL OC	—	Quick Programming w/Display Intensity	After Quick Programming with correct code # at CODE prompt.
>0	PL OC	Active	Quick Programming w/Display Intensity	After Quick Programming with correct code # at CODE prompt.
>0	PL OC	Not Active	“Full” Programming	Immediate access.
0	PL OC	Active	Quick Programming	No access
0	PL OC	Not Active	“Full” Programming	Immediate access.

Throughout this document, Programming Mode (without Quick in front) always refers to “Full” Programming (all meter parameters are accessible).

5.4 MODULE 4 - SECONDARY FUNCTION PARAMETERS (4-5EE)



MAX CAPTURE DELAY TIME*



0.0 to 3275.0 sec.

When the Input Display is above the present MAX value for the entered delay time, the meter will capture that display value as the new MAX reading. A delay time helps to avoid false captures of sudden short spikes.

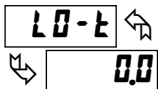
UNITS LABEL BACKLIGHT*



ON OFF

which can be installed in to the meter's bezel display assembly. The backlight for these custom units is activated by this parameter.

MIN CAPTURE DELAY TIME*



0.0 to 3275.0 sec.

When the Input Display is below the present MIN value for the entered delay time, the meter will capture that display value as the new MIN reading. A delay time helps to avoid false captures of sudden short spikes.

DISPLAY OFFSET VALUE*



- 19999 to 19999

Unless a Zero Display was performed or an offset from Module 1 scaling is desired, this parameter can be skipped. The Display Offset Value is the difference from the Absolute (gross) Display value to the Relative (net) Display value for the same input level. The meter will automatically update this Display Offset Value after each Zero Display. The Display Offset Value can be directly keyed-in to intentionally add or remove display offset. See Relative / Absolute Display and Zero Display explanations in Module 2.

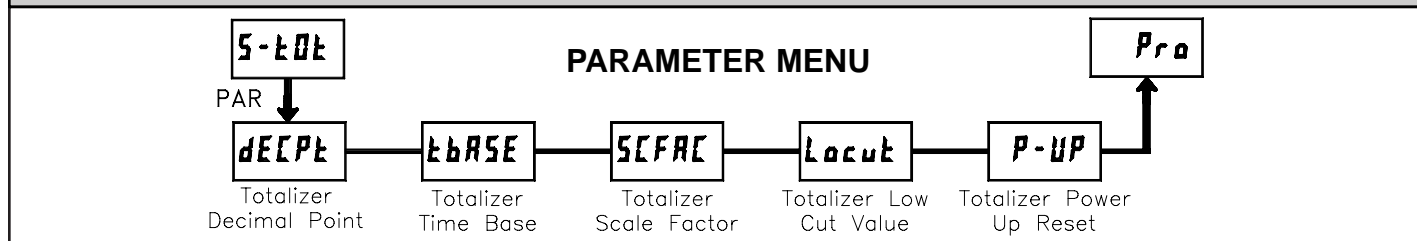
DISPLAY UPDATE RATE*



1 2 5 10 20 updates/sec.

This parameter determines the rate of display update. When set to 20 updates/second, the internal re-zero compensation is disabled, allowing for the fastest possible output response.

5.5 MODULE 5 - TOTALIZER (INTEGRATOR) PARAMETERS (5-*tot*)



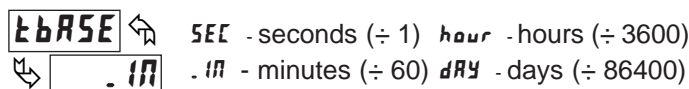
The totalizer accumulates (integrates) the Input Display value using one of two modes. The first is using a time base. This can be used to compute a time-temperature product. The second is through a user input or function key programmed for Batch (one time add on demand). This can be used to provide a readout of temperature integration, useful in curing and sterilization applications. If the Totalizer is not needed, its display can be locked-out and this module can be skipped during programming.

TOTALIZER DECIMAL POINT*



For most applications, this matches the Input Display Decimal Point (**dECPt**). If a different location is desired, refer to Totalizer Scale Factor.

TOTALIZER TIME BASE



This is the time base used in Totalizer accumulations. If the Totalizer is being accumulated through a user input programmed for Batch, then this parameter does not apply.

TOTALIZER SCALE FACTOR*



For most applications, the Totalizer reflects the same decimal point location and engineering units as the Input Display. In these cases, the Totalizer Scale Factor is 1.000. The Totalizer Scale Factor can be used to scale the Totalizer to a different value than the Input Display. Common possibilities are:

1. Changing decimal point location (example tenths to whole)
2. Average over a controlled time frame.

Details on calculating the scale factor are shown later.

If the Totalizer is being accumulated through a user input programmed for Batch, then this parameter does not apply.

TOTALIZER LOW CUT VALUE*



A low cut value disables Totalizer when the Input Display value falls below the value programmed.

TOTALIZER POWER UP RESET*



The Totalizer can be reset to zero on each meter power-up by setting this parameter to reset.

* Factory Setting can be used without affecting basic start-up.

TOTALIZER HIGH ORDER DISPLAY

When the total exceeds 5 digits, the front panel annunciator **TOT** flashes. In this case, the meter continues to totalize up to a 9 digit value. The high order 4 digits and the low order 5 digits of the total are displayed alternately. The letter "**h**" denotes the high order display.

TOTALIZER BATCHING

The Totalizer Time Base and scale factor are overridden when a user input or function key is programmed for store batch (**bAt**). In this mode, when the user input or function key is activated, the Input Display reading is one time added to the Totalizer (batch). The Totalizer retains a running sum of each batch operation until the Totalizer is reset. This is useful in weighing operations, when the value to be added is not based on time but after a filling event.

TOTALIZER USING TIME BASE

Totalizer accumulates as defined by:

$$\frac{\text{Input Display} \times \text{Totalizer Scale Factor}}{\text{Totalizer Time Base}}$$

Where:

Input Display - the present input reading

Totalizer Scale Factor - 0.001 to 65.000

Totalizer Time Base - (the division factor of **tBASE**)

Example: The input reading is at an average of 10.0°C per hour. The Totalizer is used to verify this average reading in a controlled time frame of 4 hours. Because the Input Display and Totalizer are both in tenths of °C, the Totalizer Scale Factor is 1. However, the Totalizer Time Base is hours (3600) divided by the 4 hours in the controlled time frame to yield a Totalizer Scale Factor of 0.250. By placing these values in the equation, the Totalizer will accumulate every second as follows:

$$\frac{10.0 \times 0.250}{3600} = 0.00069 \text{ accumulates each second}$$

This results in:

0.04167 accumulates each minute

2.5 accumulates each hour

10.0 reached at the end of 4 hours

TOTALIZER SCALE FACTOR CALCULATION EXAMPLES

1. When changing the Totalizer Decimal Point (**dECPt**) location from the Input Display Decimal Point (**dECPt**), the required Totalizer Scale Factor is multiplied by a power of ten.

Example: Input (**dECPt**) = 0.0

Input (**dECPt**) = 0.00

Totalizer dECPt	Scale Factor
0.00	10
0.0	1
0	.1
x10	.01
x100	.001

Totalizer dECPt	Scale Factor
0.000	10
0.00	1
0.0	.1
0	.01
x10	.001

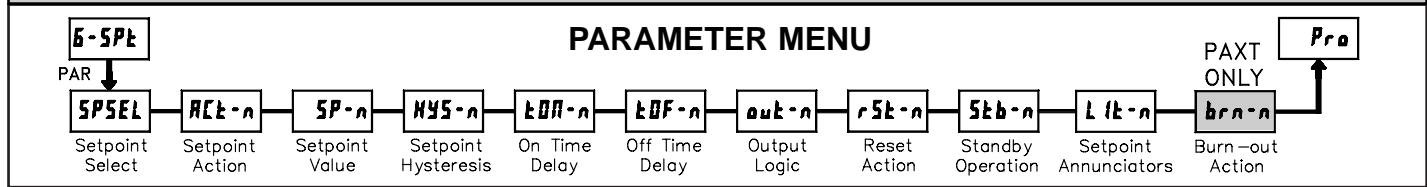
(x = Totalizer display is round by tens or hundreds)

2. To obtain an average reading within a controlled time frame, the selected Totalizer Time Base is divided by the given time period expressed in the same timing units.

Example: Average temperature per hour in a 4 hour period, the scale factor would be 0.250. To achieve a controlled time frame, connect an external timer to a user input programmed for **stAt**. The timer will control the start (reset) and the stopping (hold) of the totalizer.

Modules 6, 7, and 8 are accessible only with the appropriate plug-in cards installed. A quick overview of each Module is listed below. Refer to the corresponding plug-in card bulletin for a more detailed explanation of each parameter selection.

5.6 MODULE 6 - SETPOINT (ALARM) PARAMETERS (6-5Pt)

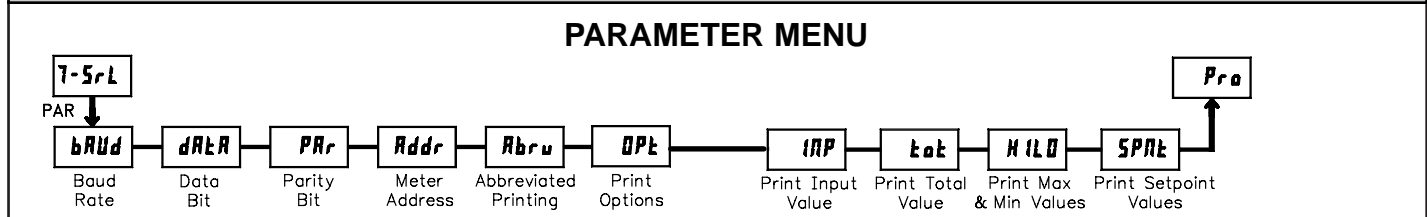


Repeat programming for each setpoint.

SPSEL - SELECT SETPOINT	no SP-1	SP-3
	SP-2	SP-4
Act-n - SETPOINT ACTION	OFF	dE-HI
	Ab-HI	dE-LO
	Ab-LO	bAND
	RU-HI	totLo
	RU-LO	totHI
SP-n - SETPOINT VALUE	- 19999 to 99999	
HY5-n - SETPOINT HYSTERESIS	1 to 65000	

tOn-n - ON TIME DELAY	00 to 32750 sec
tOff-n - OFF TIME DELAY	00 to 32750 sec
out-n - OUTPUT LOGIC	nor rEu
rSt-n - RESET ACTION	RUto LALC2 LALC1
Stb-n - STANDBY OPERATION	no YES
Llk-n - SETPOINT ANNUNCIATORS	OFF rEu nor FLASH

5.7 MODULE 7 - SERIAL COMMUNICATIONS PARAMETERS (7-5rL)

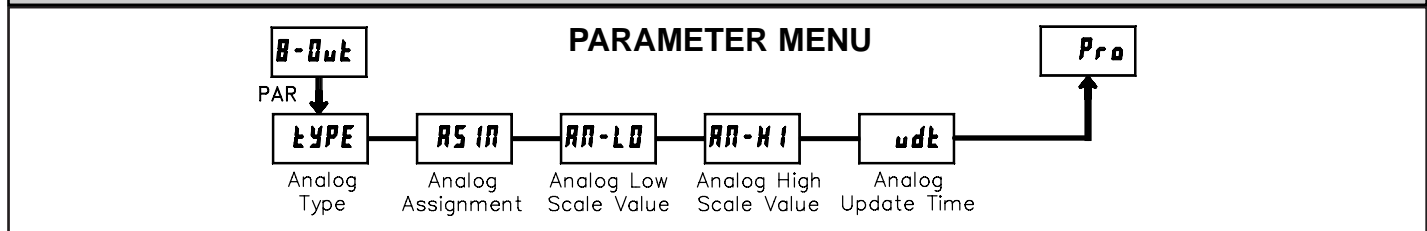


This module is for RS232 and RS485.

bAUD - BAUD RATE	300	4800
	600	9600
	1200	19200
	2400	
dAtA - DATA BITS	7	8
PAR - PARITY BIT	odd	no
	EVEN	

Addr - METER ADDRESS	0 to 99
Abvu - ABBREVIATED PRINTING	no YES
OPt - PRINT OPTIONS	no
	YES inp HILO tot SPnt

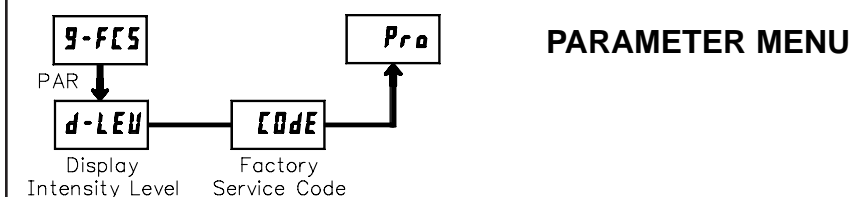
5.8 MODULE 8 - ANALOG OUTPUT PARAMETERS (8-0ut)



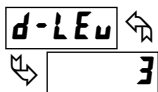
tYPE - ANALOG TYPE	0-20	0-10
	4-20	
AS in - ANALOG ASSIGNMENT	inp	LO
	HI	tot

AN-LO - ANALOG LOW SCALE VALUE	- 19999 to 99999
AN-HI - ANALOG HIGH SCALE VALUE	- 19999 to 99999
udt - ANALOG UPDATE TIME	00 to 100 sec.

5.9 MODULE 9 - FACTORY SERVICE OPERATIONS (9-F[5])

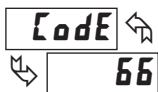


DISPLAY INTENSITY LEVEL



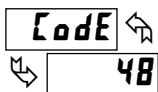
Enter the desired Display Intensity Level (0-15) by using the arrow keys. The display will actively dim or brighten as the levels are changed. This parameter also appears in Quick Programming Mode when enabled.

RESTORE FACTORY DEFAULTS



Use the arrow keys to display **CODE 66** and press **PAR**. The meter will display **RESET** and then return to **CODE 50**. Press **DSP** key to return to Display Mode. This will overwrite all user settings with the factory settings.

CALIBRATION



The meter has been fully calibrated at the factory. Scaling to convert the input signal to a desired display value is performed in Module 1. If the meter appears to be indicating incorrectly or inaccurately, refer to Troubleshooting before attempting to calibrate the meter.

When recalibration is required (generally every 2 years), it should only be performed by qualified technicians using appropriate equipment. Calibration does not change any user programmed parameters. However, it may affect the accuracy of the input signal values previously stored using the Apply (**RPLY**) Scaling Style.

Calibration may be aborted by disconnecting power to the meter before exiting Module 9. In this case, the existing calibration settings remain in effect.

DAG-AXV - Input Calibration



WARNING: Calibration of this meter requires a signal source with accuracy of 0.01% or better and an external meter with an accuracy of 0.005% or better.

Before starting, verify that the precision signal source is connected to the correct terminals and ready. Allow a 30 minute warm-up period before calibrating the meter. **no** and **PAR** can be chosen to exit the calibration mode without any changes taking place.

Then perform the following procedure:

1. Use the arrow keys to display **CODE 48** and press **PAR**.
2. Choose the range to be calibrated by using the arrow keys and press **PAR**. (**no** and **PAR** can be chosen to exit the calibration mode without any changes taking place.)
3. When the zero range limit appears on the display, apply the appropriate:
 - Voltage range: dead short applied
 - Current range: open circuit
4. Press **PAR** and **----** will appear on the display for about 10 seconds.
5. When the top range limit appears on the display, apply the appropriate:
 - Voltage range: 10 VDC
 - Current range: 20 mADC
6. Press **PAR** and **----** will appear on the display for about 10 seconds.
7. When **no** appears, press **PAR** twice.
8. If the meter is not field scaled, then the input display should match the value of the input signal.
9. Repeat the above procedure for each input range to be calibrated.

ANALOG OUTPUT CARD CALIBRATION

Before starting, verify that the precision voltmeter (voltage output) or current meter (current output) is connected and ready. Perform the following procedure:

1. Use the arrow keys to display **CODE 48** and press **PAR**.
2. Use the arrow keys to choose **OUT** and press **PAR**.
3. Using the chart below, step through the five selections to be calibrated. At each prompt, use the DAG arrow keys to adjust the external meter display to match the selection being calibrated. When the external reading matches, or if this range is not being calibrated, press **PAR**.

SELECTION	EXTERNAL METER	ACTION
00.A	0.00	Adjust if necessary, press PAR
40.A	4.00	Adjust if necessary, press PAR
200.A	20.00	Adjust if necessary, press PAR
00u	0.00	Adjust if necessary, press PAR
100u	10.00	Adjust if necessary, press PAR

4. When **no** appears remove the external meters and press **PAR** twice.

TROUBLESHOOTING

PROBLEM	REMEDIES
NO DISPLAY	CHECK: Power level, power connections
PROGRAM LOCKED-OUT	CHECK: Active (lock-out) user input ENTER: Security code requested
MAX, MIN, TOT LOCKED-OUT	CHECK: Module 3 programming
INCORRECT INPUT DISPLAY VALUE	CHECK: Module 1 programming, Input Range Jumper position, input connections, input signal level, Module 4 Display Offset is zero, press DSP for Input Display PERFORM: Module 9 Calibration (If the above does not correct the problem.)
"OLOL" in DISPLAY (SIGNAL HIGH)	CHECK: Module 1 programming, Input Range Jumper position, input connections, input signal level
"ULUL" in DISPLAY (SIGNAL LOW)	CHECK: Module 1 programming, Input Range Jumper position, input connections, input signal level
JITTERY DISPLAY	INCREASE: Module 1 filtering, rounding, input range CHECK: Wiring is per EMC installation guidelines
MODULES or PARAMETERS NOT ACCESSIBLE	CHECK: Corresponding plug-in card installation
ERROR CODE (Err 1-4)	PRESS: Reset KEY (If cannot clear contact factory.)
DISPLAY ZERO'S AT LEVELS BELOW 1% OF RANGE	PROGRAM: Module 4 as Hi-t: 0.0 LO-t: 3271.1 (to disable zero chop feature)

For further assistance, contact technical support at the appropriate company numbers listed.

DAG-AXV PROGRAMMING QUICK OVERVIEW

