NewGen Series
Panel Mount Hour/Maintenance Meter

SenDEC has created the most *powerful* maintenance meter on the market today. Until now, there have never been so many rich features and options packed into one cost effective, robust solution. The New Gen will change hour metering and the maintenance monitoring as we know them today!

Features at a glance:

- Hour meter
- 2 Timers
- 3 Service Alerts
- Cycle event counter
- Warranty clock
- LCD Display always lit

- Volt meter with alarms
- Tachometer
- Smart sense counting
- Equipment Battery saver
- Power up message
- Power down message

- Universal AC/DC input
- Inductive input
- Generic I/O
- Multiple stock messages
- OEM custom messages
- 100% epoxy sealed

FEATURES and OPERATION:

Mode Button

a) Simple Mode button toggles through available modes, clear alarms and more
b) Sealed and tested for the harshest environments
(note: also available without a Mode button)

Hour Meter and Timers

Total timer counts in tenths, then whole hours up to 99,999 hours (non resettable)
Timer 1 counts in tenths, then whole hours up to 99,999 hours (resettable or non resettable)
Timer 2 counts in tenths, then whole hours up to 99,999 hours (resettable or non resettable)
(Note: If the OEM selects the Timer(s) as resettable, the time can be reset by holding the Mode button down for 3 seconds while in the Timer1 or Timer2 mode respectively.)

Advanced Service Alerts

SenDEC Service alerts are unmatched! Choose from 3 Service Alerts with break in intervals, decide when to warn the customer, how often to display the alert, choose resettable or automatic service alerts, sync up multiple alerts, activate an LED or signal output.

- Three (3) Service Alerts (1 to 9,999 hour interval)
- One time Breakin interval option for each alarm (1 to 999 hours)
- Reset the Service Alert by holding down the Mode button for 3 seconds, or 10 seconds
- Interval sync up option so multiple services come due at the same time
- *Flash Alert* trigger: (OEM can decide when to flash alerts on LCD regardless of what mode the meter is in, plus how often to flash).
- View hours remaining in the Service interval by pressing an releasing the mode button
- Standard and custom messages available.

Service Alerts: Service alerts are count down intervals (run hours). The interval how frequently service is due (in run hours). (Example, Change Oil every 25 hours). After the interval is reached, the LCD will show to service "NOW". The LCD shows how many hours are left before service is due.

Break in Interval: The user can select a one time break in interval that is different than recurring intervals (Example: Change Oil every 5 hours the 1st time, 25 hours thereafter). Each alert can be set up with a break in interval.

Reset the Service Alert: The interval/service alert can be reset per the OEM options below:
  a) Reset anytime by holding down the Mode button for 3 seconds while in Service Alert mode.
  b) Reset only when the alert is flashing by holding down the Mode button for 3 seconds, while in Service Alarm mode
  c) Reset Automatically after the interval is reached (generally used for non Mode button versions)
  Note: OEM can select Mode button reset after 9 seconds hold time instead of 3 seconds

Interval Sync up: Intervals can sync up with other service alarms so multiple services come due at the same time. (this so multiple maintenance can be done while the equipment is in the shop).

Flash Alert Trigger: The OEM can decide when to start flashing service alerts on the LCD, <u>regardless of what mode the meter is in</u>. This feature alerts the user that a required service is coming due soon. (Example: The normal service interval is 25 hours. Start alert flashing when the interval gets down to 6 hours... the LCD starts flashing "CHG Oil in 6 hours", "CHG Oil in 5 hours", and so on until the interval is reached " CHG Oil NOW".

How often to Flash Alert: Once the Flash Alert Trigger is started, the OEM can define how often the service alert is flashed on the LCD (example, flash "CHG Oil" service alert every 4 seconds).   OEM selectable from 1 second to 60 seconds

Event Counter

Counts power up cycles. Cycles can be resettable or non resettable and can be viewed on the display in the following manners:
a) View automatically when the equipment is powered off
b) View when toggled to by the Mode button (when chosen to be a viewable mode).
  Note: If the OEM selects the event counter as resettable, the counts can be reset by holding the Mode button down for 3 seconds while in the Even Counter mode.

Warranty Watcher

The warranty watcher is a Real time clock to track and display the equipment warranty period.
a) While in warranty, a small dot on the LCD flashes.   .
b) When the warranty period is expired, the dot on the LCD goes solid.
c) The OEM specifies the number of warranty years from 1 year to 11 years
d) The OEM establishes a *grace period* before initialization of warranty clock. (for example allow 8 hours of run time before the warranty clock starts counting).

Tachometer

The tachometer can display up to 9,999 rpm with 1% resolution. For button versions, the Tachometer mode can be accessed using the Mode button.   For non-button meters, the tachometer is only displayed while the engine is running. Various firing patterns are available. The primary input for the tachometer is the Inductive input.

Power up, Power down messages

a) Messages can be displayed on the LCD on power up or power down of the equipment.
b) The OEM specifies the message and how many times the message is repeated. For Example: on power up display "SEAT BELT" three times. (repeat can be 1-15 times)

Volt Meter

The equipment voltage can be monitored and displayed on the LCD.
a) The voltage can be viewed by using the Mode button to toggle to the Volt Meter Mode. –or- The voltage can be displayed automatically on the LCD on power up for several seconds.
b) Measures from 8 volts to 19.9 volts DC with 0.1 volt resolution, +/-2% accuracy. -40C to +70C

Volt Meter Alarms

The OEM can determine what over or under voltage levels will trigger an alarm. When an over or under voltage level is detected, an alarm message will appear on the LCD, regardless of what Mode the meter is in. (Exp: "Volts Lo", or "Volts Hi")

Smart Sense counting

Smart Sense only counts hours when the engine is running. This is useful if the user leaves the key in the ON position without the engine running, resulting in erroneous run time.
a) The OEM specifies the ON counting voltage level and OFF counting voltage between 8 volts and 19.9 volts DC
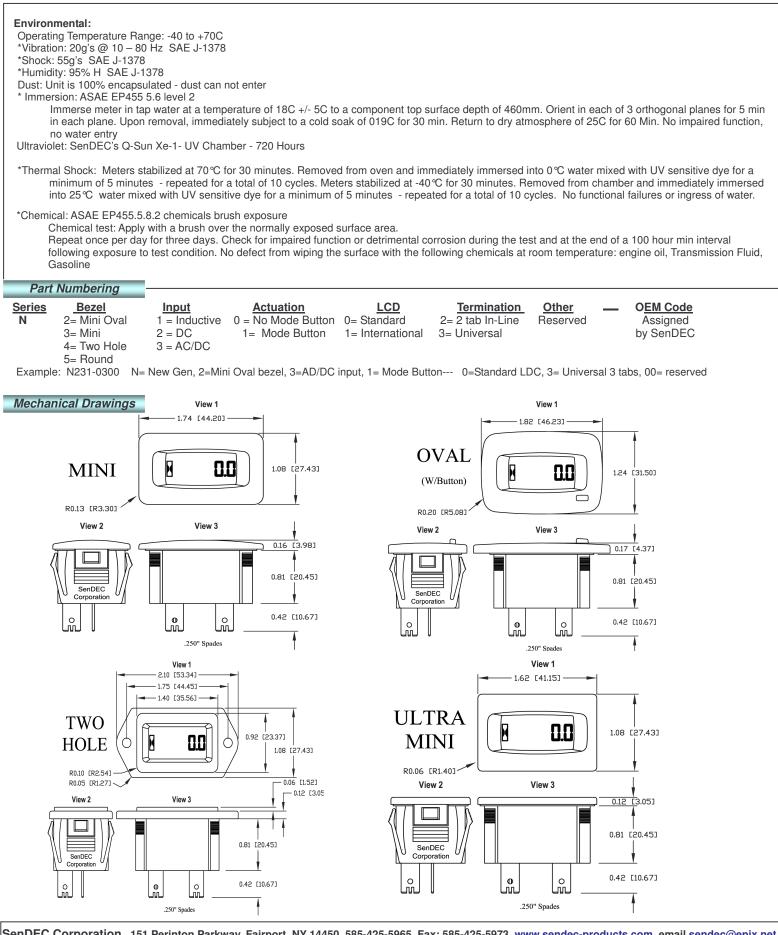
Battery Saver

This feature prevents battery drain if the equipment key switch is left ON, but the engine is not running. In this case the Solid state circuitry disconnects power drains such as a fuel solenoid or other power hogs.

"Good"
"NOW"
"CHG filter"
"chg OIL"
"chg OIL filter"
"chg bELTS"
 "chg OIL & filter"
"chg OIL & air filter"

"svc air filter"
"svc ENG air filter"
"svc ENG"
"svc DUE"
"LUbE"
"chg FUEL filter"
"svc FUEL Filter"
"chg H OIL"

"chg H OIL &filter"
"svc bATT"
"chg bELT"   chg
PLUgS"
"CHG air filter"
"svc MOW"
"SEAT"
"BELT"
"LOW volts"

"HIgH volts"
"bATT"
"TEMP"
"PTO"
"IS ON"
"LOW"
"HIgH"
**OEM custom messages

In-line hookup:
Input 60-277VAC, 5-277 VDC
,Non-polarized,
Input impedance: 2M

Packard hookup:
Input 5-100VDC
Non-polarized
Input impedance: 2M

COM

Inductive hookup:
Input: Pickup wire . other
end wrapped around a
spark plug wire

Input options:
Hour meter input types: Inductive, AD/DC, Smart Sense, I/O inputs
Timer 1 input types: Inductive, AD/DC, Smart Sense, I/O inputs
Timer 2 input types: Inductive, AD/DC, Smart Sense, I/O inputs
Volt Meter input types: DC input

Output options:
Signal level I/O (high or low level, or open drain)
LED drive output
Solenoid drive output

General Specifications:
Meter power supply: Internal lithium battery - 3 volt (Li-Mn02)
Battery Life: >12 years
Encapsulation: Internals 100% encapsulated
Input Voltage Range & Current
　DC: 5V-100V,　　　　　　50uA maximum load current
　AC: 60V-277V 50-60Hz, DC: 5-277V   135uA max load current
　　　Inductive: Ignition signal
Input load impedance: 2M
Termination: ¼" spade terminals
LCD:　Automotive Grade
　　　VA (Viewable Area): 12.7mm X 25.4mm
　　　Digit Height: 6mm
　　　Digits: 6
　　　Type: Positive Mode, TN
　　　Fluid: High Temp
　　　Polarizer – Rear: High Temp Reflective
　　　Polarizer Front: High Temp, Transmissive (antiglare)
　　　Viewing Angle: 6 o'clock
　　　Backlight – NO
　　　PCB – LCD connection: DIL pin soldered to PCB
Endurance of Hour Logging Cycles:
　　　RAM storage, unlimited.
Logging Response Time:
　　　Log ON: 1 second
　　　Log OFF: 1 second
　　　Average Log ON – Log OFF = 0
Accuracy: +/- 0.01 % @ 25C
Rear housing: ABS –black housing (Polylac PA765) with Acrylic clear
window (Altuglas MI-7-101)
Front Bezel: ABS –black housing (Polylac PA757)
Mounting – Integrated snap in case – no additional hardware/clips
required (secondary quick clip optional)
Weight: 0.95 oz. (27g)

Tests and Certifications:
Emissions: (CISPR11:2003 + A1:2004, Group1)
　　　Radiated: Class B
　　　Line Conducted: Class B
ESD (Cenelec EN61000-4-2:1995+A1:1998+A2:2001)
　　　+/-4kV contact
　　　+/- 4kV air
ESD (KeyTek handheld MZ-15/EC)
　　　+/-16kV contact
　　　+/- 16kV air
Electromagnetic Field Immunity: (Cenelec EN61000-4-3:2002)
　　　3V/m (80MHz – 1GHz)
　　　3V/m (1.4GHz – 2GHz)
　　　1V/m (3V/m (2.0GHz – 2.7GHz)
Conducted RF: (Cenelec EN61000-4-6:2007)
　　　150kHz to 80MHz 3Vrms, 1kHz 80%AM
　　　Magnetic Fields: (Cenelec EN61000-4-8:1993+A1:2001)
　　　3A/m at 50Hz
AC Input: Surges (Cenelec EN61000-4-4-5:1995+A1:2001)
　　　+/-5kV L-L, +/-1kV L-PE
AC/DC Input: Electrically Fast Transients (EFT) (Cenelec EN61000-4-4:2004)
　　　+/-1kV on AC mains w/5kHz repetition rate
　　　+/- 1kV 0n 24 DC supply w/5kHz repetition rate
　　　DC Input: Reverse polarity: N/A
　　　Normal operation rated to +/- 100V. Tested to +/- 275VDC > 1hour
DC Input: Over Voltage:
DC input tested to +/- 275VDC > 1hour
DC Input Load Dump
Normal operation rated to +/- 100V. Tested to +/- 275VDC > 1hour
Mode Button actuation (for models with mode button): > 600,000 cycles
Agency approvals: cETLus and CE

* Pending final approval – in process

Environmental:
Operating Temperature Range: -40 to +70C
*Vibration: 20g's @ 10 – 80 Hz SAE J-1378
*Shock: 55g's SAE J-1378
*Humidity: 95% H SAE J-1378
Dust: Unit is 100% encapsulated - dust can not enter
* Immersion: ASAE EP455 5.6 level 2
    Immerse meter in tap water at a temperature of 18C +/- 5C to a component top surface depth of 460mm. Orient in each of 3 orthogonal planes for 5 min
    in each plane. Upon removal, immediately subject to a cold soak of 019C for 30 min. Return to dry atmosphere of 25C for 60 Min. No impaired function,
    no water entry
Ultraviolet: SenDEC's Q-Sun Xe-1- UV Chamber - 720 Hours

*Thermal Shock: Meters stabilized at 70°C for 30 minutes. Removed from oven and immediately immersed into 0°C water mixed with UV sensitive dye for a
    minimum of 5 minutes - repeated for a total of 10 cycles. Meters stabilized at -40°C for 30 minutes. Removed from chamber and immediately immersed
    into 25°C water mixed with UV sensitive dye for a minimum of 5 minutes - repeated for a total of 10 cycles. No functional failures or ingress of water.

*Chemical: ASAE EP455.5.8.2 chemicals brush exposure
    Chemical test: Apply with a brush over the normally exposed surface area.
    Repeat once per day for three days. Check for impaired function or detrimental corrosion during the test and at the end of a 100 hour min interval
    following exposure to test condition. No defect from wiping the surface with the following chemicals at room temperature: engine oil, Transmission Fluid,
    Gasoline

Part Numbering

Series	Bezel	Input	Actuation	LCD	Termination	Other	—	OEM Code
N	2= Mini Oval	1 = Inductive	0 = No Mode Button	0= Standard	2= 2 tab In-Line	Reserved		Assigned
	3= Mini	2 = DC	1= Mode Button	1= International	3= Universal			by SenDEC
	4= Two Hole	3 = AC/DC						
	5= Round							

Example: N231-0300   N= New Gen, 2=Mini Oval bezel, 3=AD/DC input, 1= Mode Button---   0=Standard LDC, 3= Universal 3 tabs, 00= reserved

Mechanical Drawings

MINI

OVAL
(W/Button)

TWO HOLE

ULTRA MINI