NewGen Series
Panel Mount Hour/Maintenance Meter

GDi — GLOBAL DIGITAL INSTRUMENTS

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
- Time of Day Clock

Features and Operation: (**See data sheet addendum**)

Mode Button

a) Simple Mode button toggles through available modes.
b) Depress and release to toggle between available functions (hours, tachometer, service alarms, etc), while in a specific function. Depress and hold down to create an action (clear, reset, interrogate)
c) Sealed and tested for the harshest environments (note: Some models do not have a Mode button)

Hour Meter and Timers

a) Total timers counts in tenths, then whole hours up to 99,999 hours (non resettable)
b) Timer 1 counts in tenths, then whole hours up to 99,999 hours (resettable or non resettable)
c) Timer 2 counts in tenths, then whole hours up to 99,999 hours (resettable or non resettable)

(Note: Resettable timers are cleared by holding the Mode button down for 3 seconds while Timer1 or Timer2 are displayed.)

Advanced Service Alerts

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 to synchronize alerts after break-in interval
- 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 is how often service is due (in run hours). (Interval example: Change Oil every 25 hours). The LCD will show how many hours are left before service is due. .After the interval is reached, the LCD will show to service "NOW".

Break in Interval: Any Service alert can include 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)

Interval Sync Up: Used to sync up Service Alerts after a break-in Service Alert. This so multiple maintenance functions can be performed while the equipment is in the shop.

Flash Alert Trigger: The OEM can decide when to start flashing service alerts on the LCD, regardless of what mode the meter is in. 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" flashed every 4 seconds). 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) Hold Mode button down >3 seconds while total hours is displayed (Hour Meter mode)
    c) 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 Event Counter mode.

Warranty Watcher

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 15,999 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. (configurable from 1-15 times)

Volt Meter

The equipment voltage can be monitored and displayed on the LCD.
    a) Measures from 8 volts to 19.9 volts DC with 0.1 volt resolution, +/-2% accuracy. -40C to +70C
    b) Viewed by using the Mode button to toggle to the Volt Meter Mode.
    c) Viewed automatically on the LCD on power for a configurable number of seconds.
Note: Custom voltage ranges are available

Volt Meter Alarms

The OEM can determine what over or under voltage levels will trigger an alarm.
    a) When an over or under voltage level is detected, an alarm message will flash on the LCD at a 1HZ rate, regardless of what Mode the meter is in. (Exp: "Volts Lo", or "Volts Hi"). Stock or customer messages can also be displayed

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.
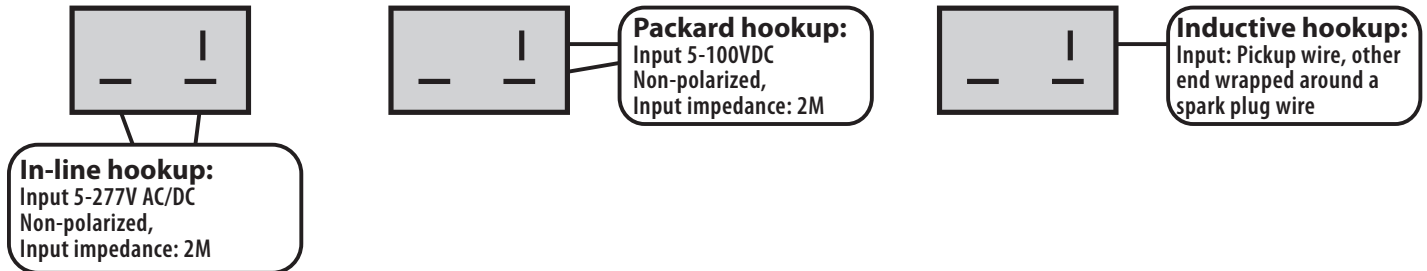   a) The OEM specifies what voltage level initiates time counting. (between 8 volts and 19.9 volts DC)

Messages

Stock and custom messages & Icons are available. Upper case and mixed case words are 7 segment digits. See stock messages below:

"Good"	"svc air filter"	"chg H OIL &filter"	"HIgH volts"
"NOW"	"svc ENG air filter"	"svc bATT"	"bATT"
"CHG filter"	"svc ENG"	"chg bELT"	chg "TEMP"
"chg OIL"	"svc DUE"	PLUgS"	"PTO"
"chg OIL filter"	"LUbE"	"CHG air filter"	"IS ON"
"chg bELTS"	"chg FUEL filter"	"svc MOW"	"LOW"
"chg OIL & filter"	"svc FUEL Filter"	"SEAT"	"HIgH"
"chg OIL & air filter"	"chg H OIL"	"BELT"	"LOW volts"

Electrical Connections

In-line hookup:
Input 5-277V AC/DC
Non-polarized,
Input impedance: 2M

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

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

Specifications and Testing

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-277V, 150uA maximum load current

   DC-Packard input: 5V-100V, 150uA maximum load current

   AC: 5V-277V 50-60Hz, 150uA max load current

AC/DC Input load impedance: 2M

Inductive: Ignition signal, Positive edge, 60-600v with dv/dt of 20v/us, frequency range 3Hz to 250Hz

Termination: ¼" spade terminals

LCD: Automotive Grade

   VA (Viewable Area): 12.7mm X 25.4mm

   Digit Height: 6mm

   Digits: 6

   Type: Positive Mode, TN

   Polarizer – Rear: High Temp Reflective

   Polarizer Front: High Temp,

   Viewing Angle: 6 o'clock

   LCD connection: Pins 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 (Mini, Oval, Ultra Mini) – quick clip for Round, screws, rivets, or quick clip for Two hole.

Weight: 0.95 oz, (27g)

Tests and Certifications:

Emissions: (CISPR11:2003 + A1:2004, Group1)

   Radiated: Class B

   Line Conducted: Class B

ESD: (CENELEC EN 61000-4-2:1995+A1:1998+A2:2001)

   +/-4kV contact

   +/-4kV air

ESD (KeyTek handheld MZ-15/EC, GDI Laboratory)

   +/-16kV contact

   +/-16kV air

Electromagnetic Field Immunity: (CENELEC EN 61000-4-3:2002)

   3V/m (80MHz – 1GHz)

   3V/m (1.4GHz – 2GHz)

   1V/m (3V/m (2.0GHz – 2.7GHz), w/1Khz, 80% AM

Conducted RF: (CENELEC EN 61000-4-6:2007)

   150kHz to 80MHz 3Vrms, 1kHz 80%AM

   Magnetic Fields: (Cenelec EN61000-4-8:1993+A1:2001)

   3A/m at 50Hz

AC Input: Surges (CENELEC EN 61000-4-5:1995+A1:2001)

   +/-1kV L-L AC/DC

Input: Electrically Fast Transients (EFT) (CENELEC EN 61000-4-4:2004)

   +/-2kV on AC mains w/5kHz repetition rate

DC Input: Reverse polarity: N/A

Normal operation rated to +/-100V. Tested to +/-275VDC > 1hour

AC/DC Input (GDI Laboratory) Electrically Fast Transients (EFT) (Cenelec +/-4kV on AC mains w/5kHz repetition rate, pulse @ 15ms, 1 hour

Mode Button actuation (for models with mode button): > 600,000 cycles Agency approvals: ETL and CE

* Pending final approval – in process

Operating Temperature Range: -40 to +70C

*Vibration SAE J-1378: 20g's @ 10 – 80 Hz *Shock: SAE J-1378: standard to 55g's, Tested to 150Gs

*Humidity SAE J-1378: 95%

*Salt Spray MIL-STD-202G, Method 101E. Test condition B: 5% neutral salt solution, 48 hours at 35C 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

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 by SenDEC
	3 = Mini	2 = DC	1 = Mode Button	1 = International	3 = Universal		
	4 = Two Hole	3 = AC/DC					
	5 = Round						
	6 = Ultra Mini						

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