



ENOVATION
CONTROLS
 A HELIOS TECHNOLOGIES COMPANY

POWERSVIEW® DISPLAYS OVERVIEW

WHY POWERVIEW®?



Technology Without Compromise



Dynamic User Experiences



Proven Reliability in Harsh Environments



Ideal For Gauge Cluster Replacement



Designed For the Life of the Equipment



Tier 4 Final / Stage V Capable

THE FULL SERIES OF POWERVIEW® DISPLAYS

Ultimate Color Displays



Edge-to-Edge Color Displays





Tactile-Button Color Displays





Monochrome Displays



 Industry leading durability and environmental protection

 Best-in-class, glare-free sunlight visibility

 Touch screens available (on some models)

 Programmable with PowerVision Configuration Studio®

DESIGNED FOR **RUGGED** MARKETS

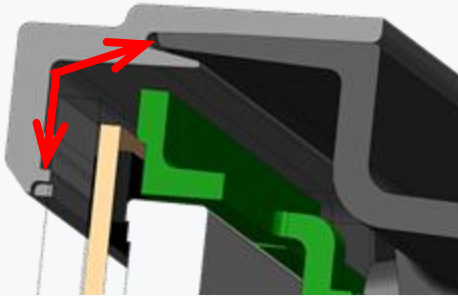


KEY DIFFERENTIATOR **RUGGED PROTECTION**

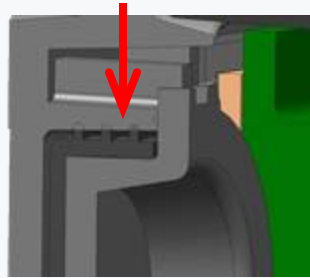
- Rated Up To **IP69K**
- Wide Operating Temperatures
- Dispensed RTV Wet Seal (lens, front, and back housing)



RTV SEAL

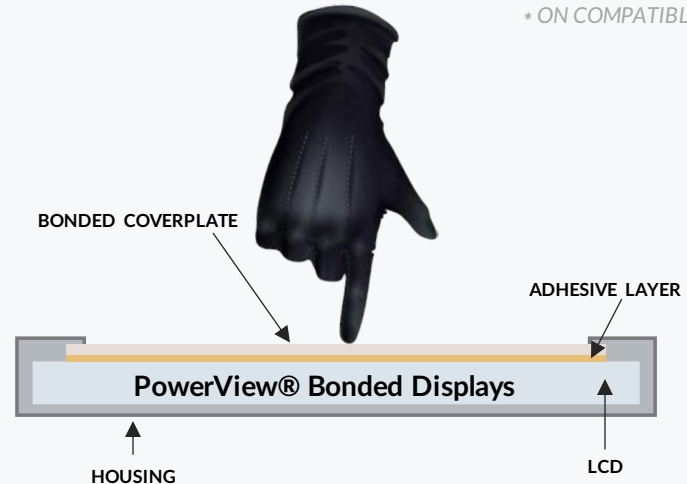
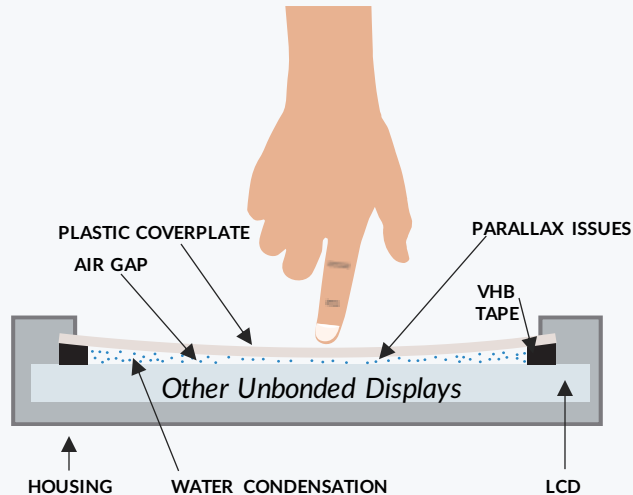


SILICON KEYPAD WITH
RADIAL SEAL DESIGN



KEY DIFFERENTIATOR **MODERN LCD TECHNOLOGY**

- Optically bonded lens improves sunlight viewability and eliminates lens fogging
- Bonding process provides increased protection of LCD and lens from shock/vibration
- Glass lens has superior scratch resistance over plastic
- Acid-etched Anti-Glare (AG) reduces perceived reflection and does not degrade or wash off
- Projected capacitive touch* with water rejection and gloved hand functionality prevents false touches
- Multi-touch capable* for fluid gesture control



* ON COMPATIBLE TOUCH DEVICES

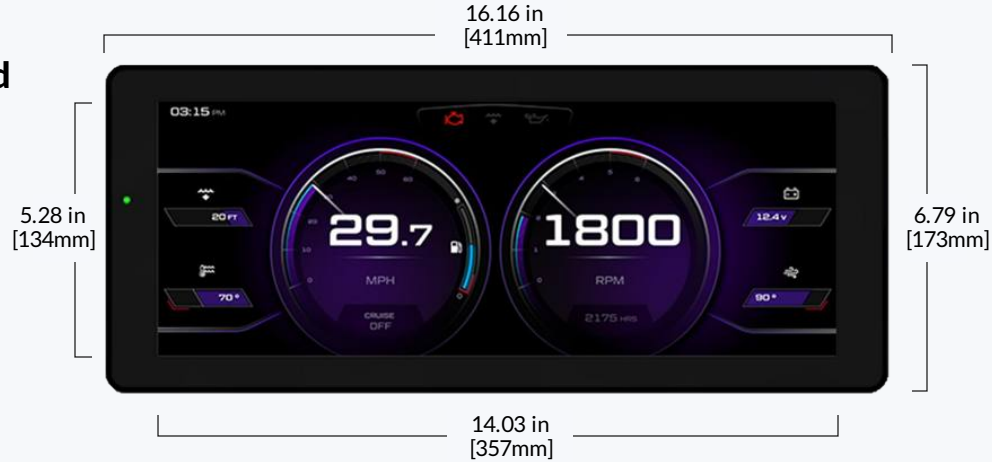


Ultimate Color Display

POWerview U150

The PowerView U150 packs ultimate power and viewability in an ultra-wide rugged display.

- Largest color display in the PowerView line at 15-inches
- Doubles the RAM & Storage of the PV1200
- Bonded glare-free LCD screen for superior visibility in sunlight
- Designed to fit the needs of the recreation marine market



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|--|-------------------|--|-------------------|
| | All Weather | | Gauge Replacement |
| | Sunlight Visible | | Video Input |
| | Great for In-Cab | | Glove-Friendly |
| | Engine Monitoring | | Touch Capable |
| | Programmable | | |

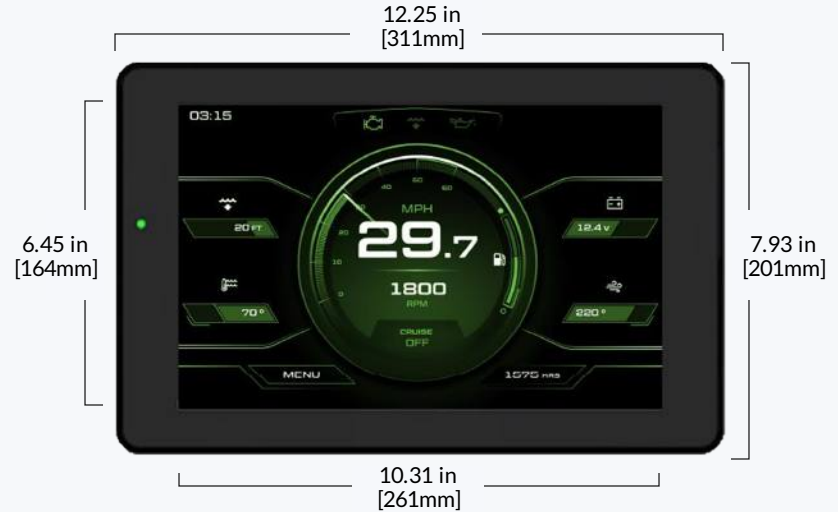
CE IP67
ENOVATION CONTROLS



POWERVIEW U120

The PowerView U120 packs ultimate power and viewability in a wide rugged display.

- 12-inch color display available in portrait and landscape orientations
- Doubles the RAM & Storage of the PV1100
- Powerful processor for smooth animations and video playback
- Bonded glare-free LCD screen for superior visibility in sunlight



-  All Weather
-  Sunlight Visible
-  Great for In-Cab
-  Engine Monitoring
-  Programmable
-  Gauge Replacement
-  Video Input
-  Glove-Friendly
-  Touch Capable

ULTIMATE COLOR **DISPLAYS COMPARED**



| | PVU150 | PVU120 |
|----------------|---|---------------------------------|
| Screen Size | 16.1" inches (411 mm x 173 mm) | 12.2" inches (311 mm x 1 mm) |
| Resolution | 1920 x 720 | 1280 x 768 (WXGA) |
| Processor | Renesas R-Car M2 with Arm Cortex A15 Dual-core CPU @ 1.5 GHz (32-bit) | |
| Communications | (2) CAN J1939, (2) USB 2.0, (1) RS-485, Bluetooth 5.0, WiFi | |
| Video | (4) NTSC/PAL, (2) Digital Ethernet | |
| Inputs | (3) Analog, (5) Digital, (1) Frequency, (2) Antenna | |
| Outputs | (1) 500mA switched low-side, (2) Frequency | |



Edge-to-Edge Displays

POWERVIEW 1200

The PowerView 1200 packs power and viewability in an ultra-wide display.

- Largest color display in the PowerView line at 12.3 inches
- High-speed processor and 8GB of internal storage
- Glass display surface offers enhanced clarity and strength
- Available with or without touch



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|--|-------------------|---|-------------------|
|  | All Weather |  | Gauge Replacement |
|  | Sunlight Visible |  | Video Input |
|  | Great for In-Cab |  | Glove-Friendly |
|  | Engine Monitoring |  | Touch Capable |
|  | Programmable | | |

POWerview 1100

The PowerView 1100 display streamlines size and speed in a single display.

- 10.6-inch color display available in portrait and landscape orientations
- High-speed processor and 8GB of internal storage
- Highest resolution PowerView display (1280x768)
- Bonded glare-free LCD screen with high-brightness for superior visibility in sunlight



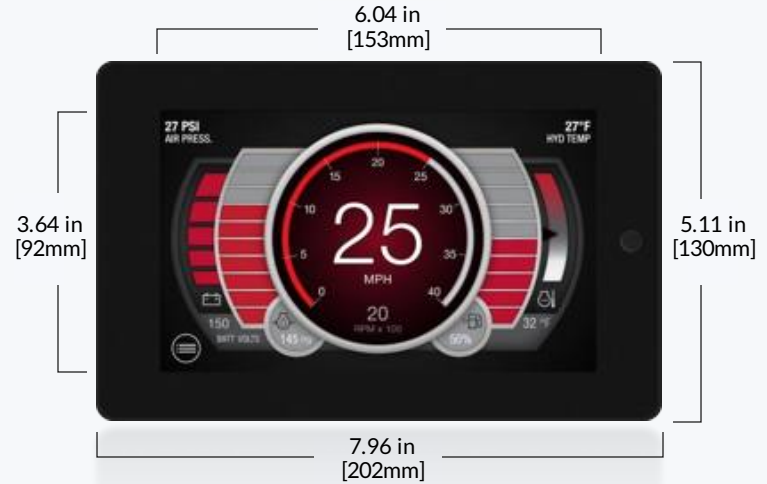
-  All Weather
-  Sunlight Visible
-  Great for In-Cab
-  Engine Monitoring
-  Programmable
-  Gauge Replacement
-  Video Input
-  Glove-Friendly
-  Touch Capable



POWerview P70

The PowerView P70 combines the modern glass-front form factor of a PV-700 with the full I/O complement of the PV-485

- 7" Premium color touchscreen display
- Bonded glare-free LCD screen for superior visibility in sunlight offers enhanced clarity and strength
- All weather durability



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|--|-------------------|---|-------------------|
|  | All Weather |  | Gauge Replacement |
|  | Sunlight Visible |  | Video Input |
|  | Great for In-Cab |  | Glove-Friendly |
|  | Engine Monitoring |  | Touch Capable |
|  | Programmable | | |

CE IP69K
ENOVATION CONTROLS



POWERVIEW 700

The PowerView 700 packs power and viewability in a compact display.

- 7-inch display with rich color graphics
- IP69K-rated enclosure for harsh environments
- Connect four video inputs and watch two feed simultaneously
- Glass display surface offers enhanced clarity and strength



-  All Weather
-  Sunlight Visible
-  Great for In-Cab
-  Engine Monitoring
-  Programmable
-  Gauge Replacement
-  Video Input
-  Glove-Friendly
-  Touch Capable



POWerview 500

The PowerView 500 packs power and versatility in an ultra-small footprint.

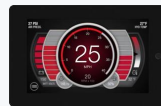
- Optically-bonded 5-inch color display designed for harsh environments
- High brightness screen for full sunlight viewability
- Glass lens offers enhanced clarity and strength



-  All Weather
-  Sunlight Visible
-  Great for In-Cab
-  Engine Monitoring
-  Programmable
-  Gauge Replacement
-  Video Input
-  Glove-Friendly
-  Touch Capable



EDGE-TO-EDGE DISPLAYS COMPARED



| | PV1200 | PV1100 | PVP70 | PV700 | PV500 |
|----------------|---|--|---|--|--|
| Screen Size | 12.3 inches (320 mm x 130 mm) | 10.6 inches (231.36 mm x 138.82 mm) | 7-inches (178 mm) | | 5-inch (108 mm x 64.8 mm) |
| Resolution | 1280 x 480 | 1280 x 768 (WXGA) | 800 x 480 (WVGA) | | |
| Processor | Dual-core CPU @ 1.5 GHz | | Dual-core CPU @ 1.0 GHz | Dual-core CPU @ 1.5 GHz | Dual-core CPU @ 1.0 GHz |
| Communications | (2) CAN 2.0B | | (2) CAN 2.0B (2) USB 2.0 (2) BT v4.2, Wi-Fi | (2) CAN 2.0B | (2) CAN 2.0B, (1) RS-485, (1) USB 2.0 |
| Video | (3) NTSC/PAL Single-Channel Viewable | | (4) NTSC/PAL Single-Channel Viewable | (4) NTSC/PAL Dual-Channel Viewable | (2) NTSC/PAL Single-Channel Viewable |
| Inputs | (3) Analog, (5) Digital, (1) Frequency | | (4) Analog (4) Digital (1) Frequency | (3) Analog (5) Digital (1) Frequency | (1) Analog (2) Digital |
| Outputs | (1) Digital, (1) Frequency | | (6) Digital (1) Frequency | (1) Digital (1) Frequency | (2) Digital |



Color Tactile-Button Displays

POWerview 780B

The PowerView 780B display provides power and reliability with an easy-to-read interface.

- 7-inch display featuring rich color graphics
- 10 tactile configurable soft keys with white LED backlight
- High-speed processor and 8GB of internal storage.
- Available in touch and non-touch models








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|---|-------------------|---|-------------------|
|  | All Weather |  | Gauge Replacement |
|  | Sunlight Visible |  | Video Input |
|  | Great for In-Cab |  | Glove-Friendly |
|  | Engine Monitoring |  | Touch Capable |
|  | Programmable | | |

POWerview 485

The PowerView 485 is an all-in-one color display and controller designed to meet the needs of modern electronic engines and equipment applications.

- 4.3-inch display featuring rich, color graphics
- 5-tactile configurable soft keys
- Customizable I/O with RS485 serial connection
- Optically-bonded glare-free LCD screen for superior visibility in sunlight



-  All Weather
-  Sunlight Visible
-  Great for In-Cab
-  Programmable
-  Gauge Replacement
-  Engine Monitoring
-  Glove-Friendly



POWERVIEW 450

The PowerView 450 features a rich features set and full customization in a compact size.

- 4.3-inch display featuring rich, color graphics
- 8-tactile configurable soft keys
- Customizable bezel, I/O interface and more
- Optional NMEA 2000 isolation
- CSA PV450 version available (Class I Div 2 Groups B, C & D)



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|---|-------------------|---|-------------------|
|  | All Weather |  | Gauge Replacement |
|  | Sunlight Visible |  | Video Input |
|  | Great for In-Cab |  | Glove-Friendly |
|  | Engine Monitoring |  | Programmable |



COLOR TACTILE-BUTTON DISPLAYS COMPARED



| | PV450 | PV485 | PV780B |
|-----------------------|--|--|--|
| Screen Size | 4.3-inches (109.22 mm) | | 7-inch (177.8 mm) |
| Resolution | 480 × 272 (WQVGA) with 16-bit color | | 800 × 480 (WVGA) with 24-bit color |
| Processor | CPU @ 532MHz | | Dual-core CPU @ 1.5 GHz |
| Communications | (2) CAN 2.0B Optional NMEA 2000 isolation | (1) CAN 2.0B (1) RS-485 | (2) CAN 2.0B |
| Video | (2) NTSC/PAL Single-Channel Viewable | - | (3) NTSC/PAL Single-Channel Viewable |
| Inputs | (1) Analog | (6) Analog (3) Digital (1) Frequency | (3) Resistive Analog (5) Digital (1) Frequency |
| Outputs | (1) Digital | (4) Digital, (1) Analog | (1) Digital, (1) Frequency |










Monochrome Displays

POWerview 380

The PowerView 380 is a robust, multifunction display for advanced monitoring of electronic engines and mechanical engines.

- Easy-to-read 3.8-inch (97 mm) QVGA monochrome LCD screen
- Loaded with standard configuration.
(Customizable using the PowerVision Configuration Studio® software)
- Setpoint alarm and shutdown control
- Equipped with five tactile push buttons to quickly access a convenient menu



-  All Weather
-  Sunlight Visible
-  Great for In-Cab
-  Programmable
-  Gauge Replacement
-  Engine Monitoring
-  Glove-Friendly







POWerview 350

The PowerView 350 is a robust, multifunction display for advanced monitoring of electronic engines with an NMEA 2000 isolated CAN port.

- Easy-to-read 3.8-inch (97 mm) QVGA monochrome LCD screen
- Loaded with standard configuration.
(Customizable using the PowerVision Configuration Studio® software)
- Equipped with five tactile push buttons to quickly access a convenient menu



- | | | | |
|---|------------------|---|-------------------|
|  | All Weather |  | Gauge Replacement |
|  | Sunlight Visible |  | Engine Monitoring |
|  | Great for In-Cab |  | Glove-Friendly |
|  | Programmable | | |

MONOCHROME TACTILE-BUTTON **DISPLAYS COMPARED**



| | PV350 | PV380 |
|----------------|---|---|
| Screen Size | 3.8-inch (97 mm) monochrome LCD screen | |
| Resolution | 320 × 240 (QVGA) | |
| Processor | CPU @ 168MHz | |
| Communications | (2) CAN 2.0B Second port is NMEA 2000 isolated | (1) CAN 2.0B (1) RS-485 serial |
| Inputs | (1) Resistive Analog <i>Backlight Control</i> | (4) Resistive Analog (3) Analog (1) Frequency |
| Outputs | (1) Digital | (2) Digital |

POWerview 101

The PowerView 101 displays 50 standard SAE J1939 parameters and offers a simple connection to optional components.

- Service Reminders – Five service reminders allow users to set hours for: Change Engine Oil, Air Filters, Hydraulic Oil, and Service Engine and Service Machine
- Enhanced alarm indicators with ultra-bright alarm and shutdown LEDs
- Resistive touch buttons
- Multiple language options



All Weather



Engine Monitoring



POWerview 101 SPECIFICATIONS



| | PV101 |
|----------------|--|
| Screen Size | 1.3 x 2.6 in. (33 x 66 mm) |
| Resolution | 64 x 128 pixels |
| Communications | (1) CAN [Supports 50 SAE J1939 Parameters] (1) Auxiliary RS-485 |
| Inputs | (1) Resistive Analog <i>Backlight Control or Fuel Sender</i> |
| Outputs | (1) 5V PVM Power |

THE FULL HMI EXPERIENCE WITH POWERVIEW DISPLAYS

Designed for Custom Software

- Work with Enovation Controls' partners and in-house software experts to design custom software built to your application's requirements and users
- Or build on your own with **PowerVision Configuration Studio®** software. Our library of [tutorials, examples and video](#) will help you quickly develop software that gives your customers the ultimate interface experience with total machine control

Features and Benefits of PowerVision Configuration Studio

- Drag-and-drop page designer and programming interface
- Program logic using state machines, activity programs and C-based scripting
- Full support for NMEA 2000 & SAE J1939 messaging, DM1, and DM2
- Includes built-in applications for data logging, machine hours, and external radio head control
- Common development platform makes it easy to move your configuration work from one display to another
- Connect directly to displays for reprogramming over USB
- Multi-language programming support for 10+ languages
- Available for download through the SPARK® Software Management cloud with annual per-user licensing





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THANK YOU

APPENDIX 1: INGRESS PROTECTION RATINGS

| IP66 Powerful water jets | IP67 Immersion (depth up to 1 meter) | IP68 Immersion (1 meter or more depth) | IP69K Powerful high temperature water jets |
|--|---|---|---|
| PV1200 PV1100 PV780B PV700 PV500 PV485 PV450 PV380* PV350* | PV1200 PV1100 PV780B PV500 PV485 PV450 PV380 PV350 | PV101 | PV700 PV101-HAZ |

* with panel gasket

Unless otherwise noted, to meet ratings, displays must have plugs in all connectors

APPENDIX 2: VIBRATION AND SHOCK

| 3-Axis Vibration Tested | |
|---|-----------------------|
| PV1100 PV1200 | 3.9 Grms (10 - 350Hz) |
| PV780B PV700 PV485 PV450 PV380 PV350 | 7.86 Grms (5-2000Hz) |
| PV500 | 8.17 Grms (5-2000Hz) |

All Displays: Shock tested $\pm 50G$ in 3 axes

APPENDIX 3: WIDE TEMPERATURE RANGES

| Display | Max. Cold Temp |
|--|--|
| PV1200 PV1100 PV780B PV700 PV500 (Storage) PV485 PV450 PV380* PV350* PV101* | -40° C (-40° F) * With Heater |
| PV500 (Operation) | -30° C (-22° F) |

| Display | Max. Hot Temp |
|---|-----------------|
| PV1200 (Storage) PV1100 (Storage) PV780B PV700 PV500 PV485 PV450 PV380 PV350 PV101 | +85° C (+185 F) |
| PV1200 (Operation) PV1100 (Operation) | +70° C (+158 F) |

Unless otherwise noted, temperatures cover maximum storage and operating ranges

APPENDIX 4: VOLTAGE RANGE

| Display | Minimum VDC | Maximum VDC |
|--|-------------|-------------|
| PV1200 PV1100 PV780B PV700 PV500 PV380 PV350 | 6 | 36 |
| PV485 PV450 | 6 | 32 |
| PV101 | 8 | 32 |

Reverse Polarity Protected