Macquarrie

MULTIPLEXING

Vehicle, Marine & Machinery Control Solutions

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CONTENTS

Multiplexing Systems	1
Multiplexing Explained	3
HMI Displays	4
Telemetry & IoT Solutions	6
Can Keypads	8
Hydraulic Controllers	10
Input / Output Modules	11
uControl™	12
Wiring Looms	14
HMI Display Specifications	15

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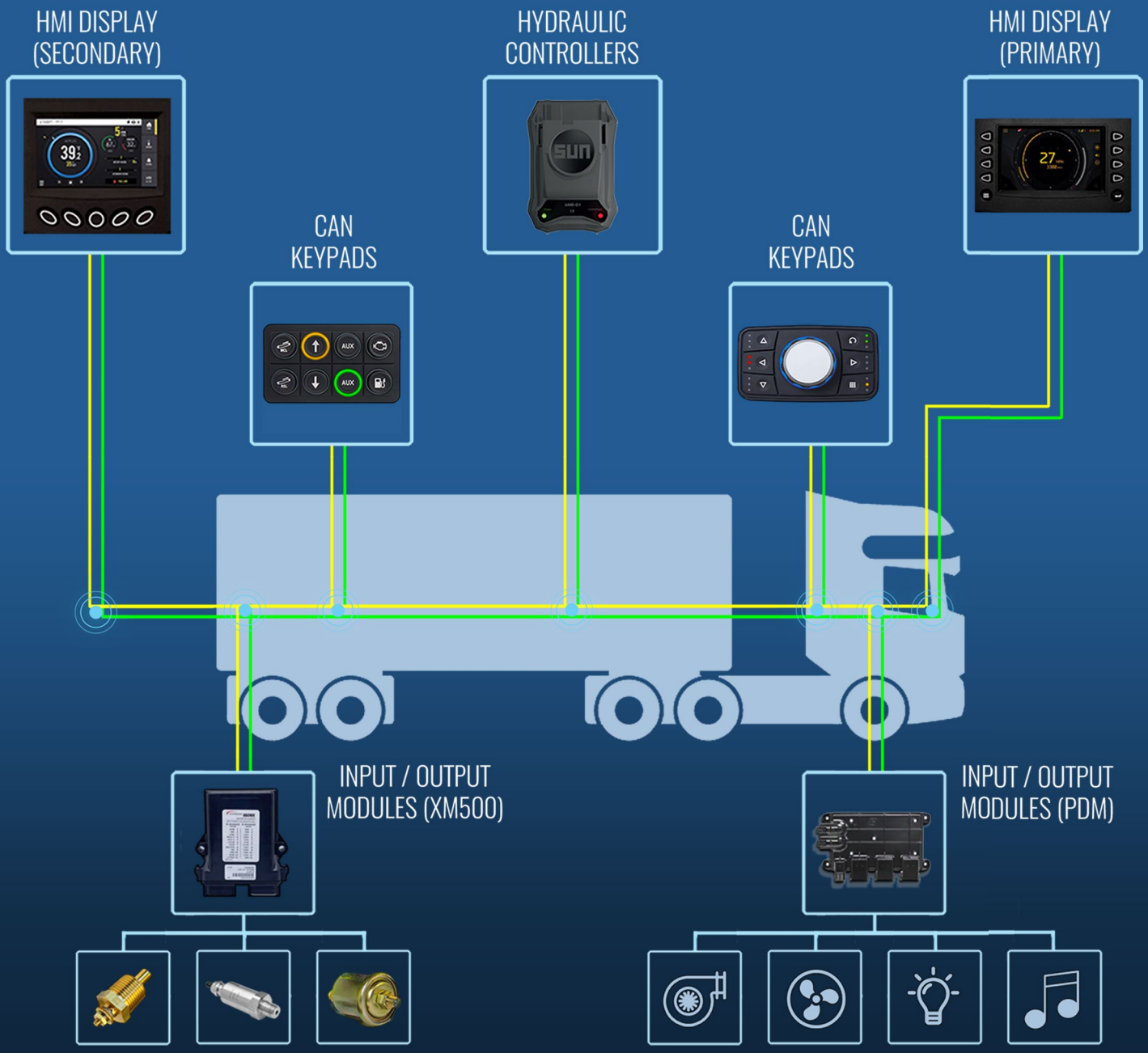
Integrators of control, monitoring & protection solutions



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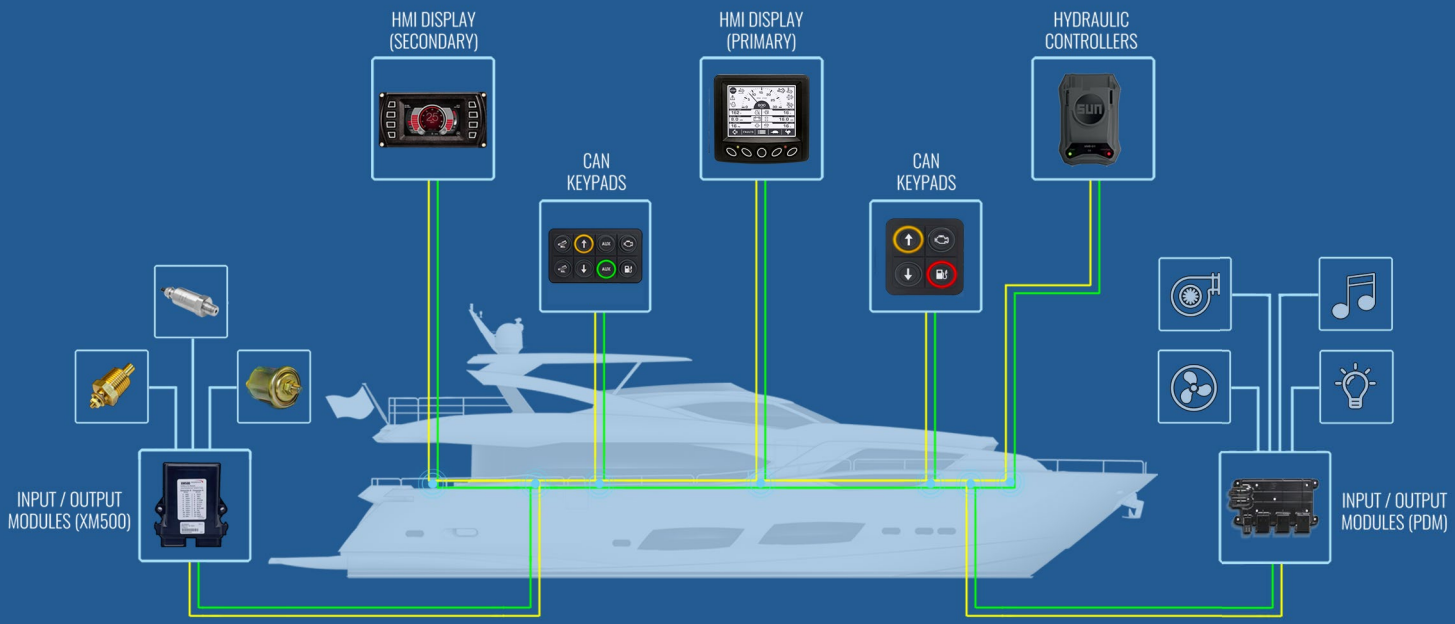

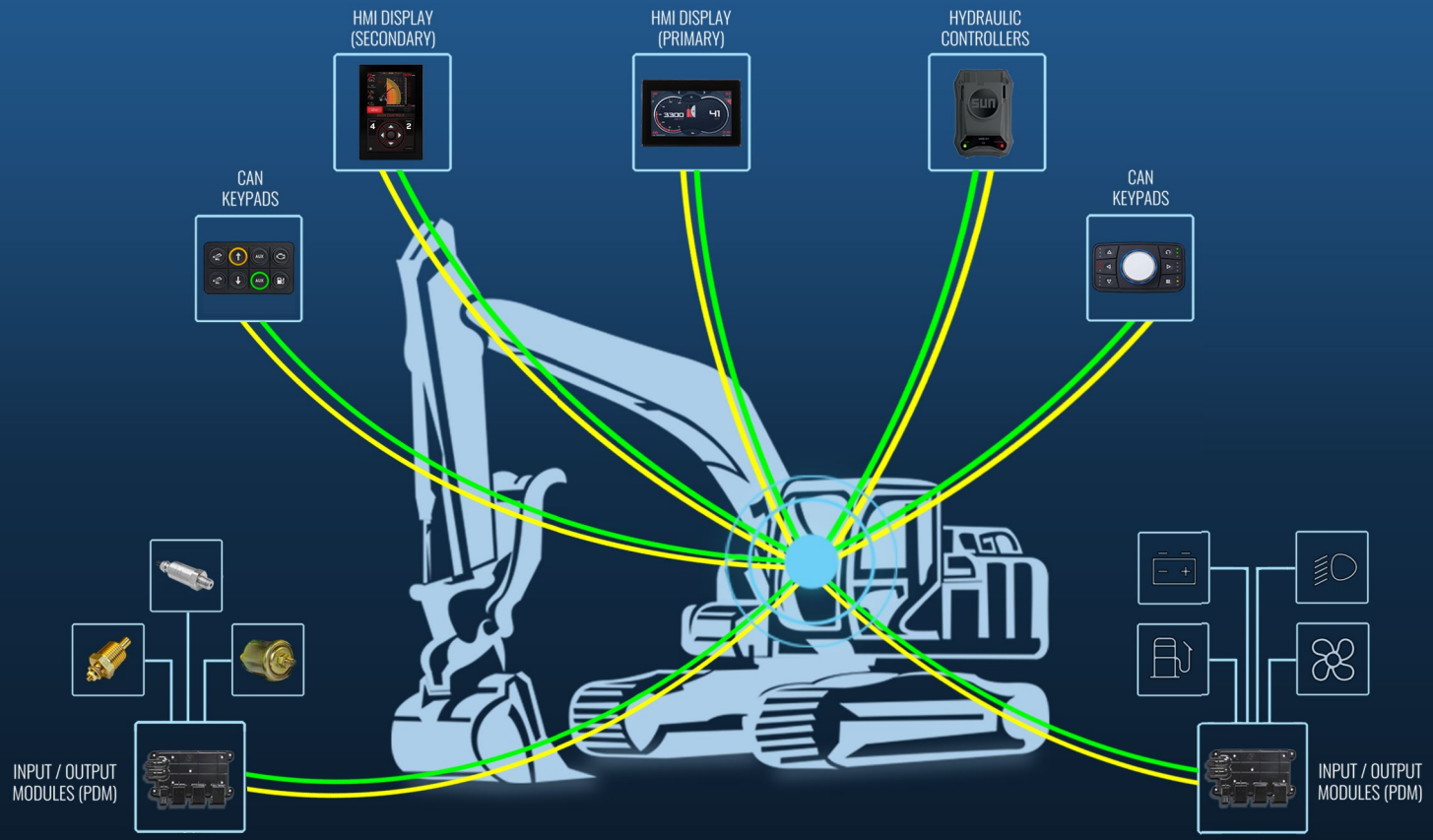

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MULTIPLEXING is a control method that utilises a communication line in order to remove expensive and complicated wiring systems, and adds automation and intelligent systems to a vehicle.

WHAT IS IT?

Instead of traditional systems where each function requires a trigger switch, to a relay, through a fuse, and to the final component (work lights, sirens, hydraulics, etc) Multiplexing uses only four wires for each component, and adds additional functionality, including:

- Smart Fuses
  - Reset automatically on tripping
- Diagnostic Read-outs
  - Immediately identify failing components
- Current Feedback
  - Early identification of potential risks
- Modular Addition
  - New sub-systems can be retrofitted easily
- Customised Solutions

WHY USE IT?

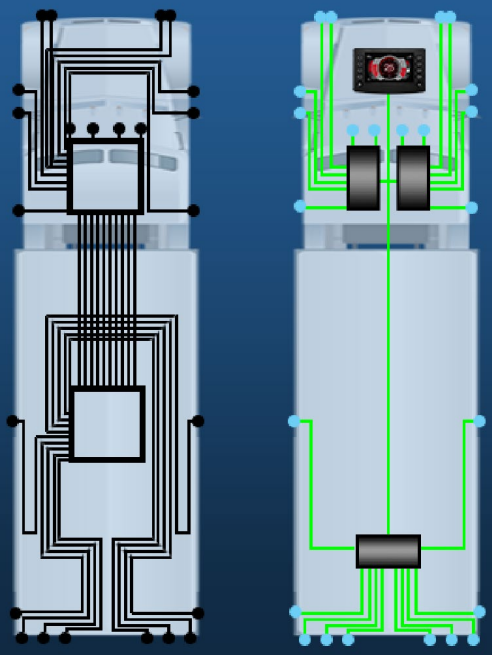
Multiplexing is the future of all vehicle, marine and mobile machinery control systems.

Critical operational systems, such as emergency sirens, hydraulic cylinders, or water pumps require complex wiring systems and a significant number of sub-components in order to operate. Every sub-component in a critical system, from a relay, fuse, wire, terminal, or switch, can be potential failure point that can either cease crucial functions in an urgent situation, or require signifi cant servicing costs in downtime to diagnose an issue.

Multiplexing removes these potential failure points, saves a signifi cant amount of wiring costs, and simultaneously adds more complex automation capabilities, diagnostics, and the ability to future proof your vehicle for any upgrades that your customers and users may require.

HOW DOES IT WORK?

- The brain of the multiplexing system is the HMI display
- Devices are simply added to the CAN backbone (Keypads, I/O, Hydraulics)
- Example Function Explained:
  - CAN keypad button is pressed, and sends a signal VIA CAN
  - IX3212 receives the command, and turns on a DC motor, work light, or other device
  - Diagnostic Feedback on device is displayed on HMI Display
- Malfunctions are immediately identified VIA on-screen diagnostics
- Complete control is achieved, without a single relay, blade fuse, or copper wire



KEY BENEFITS

- Less Downtime
- Reduced Installation & Maintenance Costs
- Modular & can be modified in-situ
- Automation and Control
- Removes failure points, such as: fuses, relays, faulty wiring, switches, and solder joints

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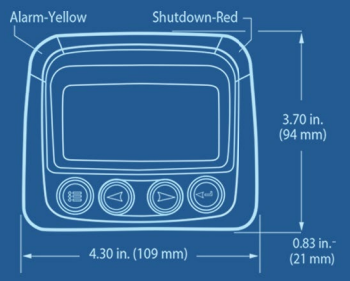
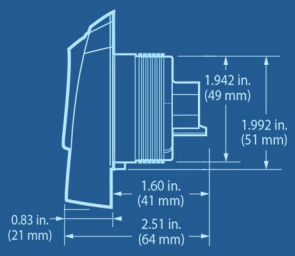
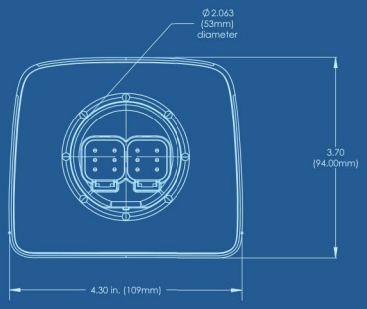
REVOLUTIONISING DISPLAY TECHNOLOGY

We are relentless in our pursuit of improved user experiences and performance-enhancing technology with display solutions that boast ease-of-use, intuitive design and rich customisation. With best in class viewability and a wide range of sizes, there's a PowerView® display perfectly suited to any mechanical or electronic engine or equipment application.

PV101







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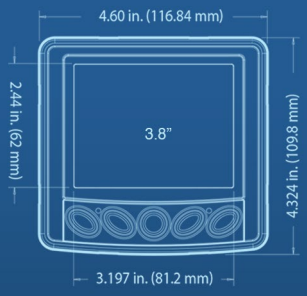

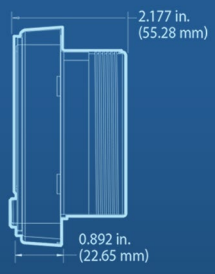

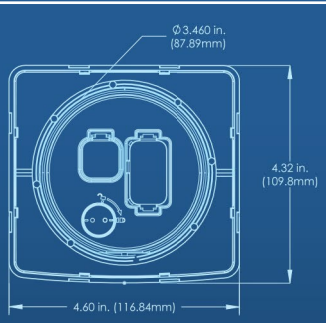

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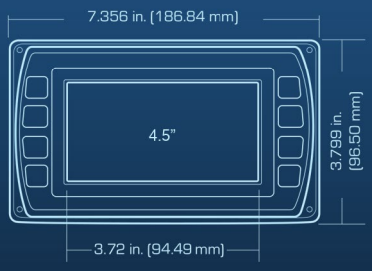

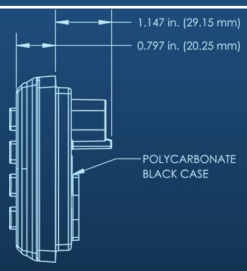

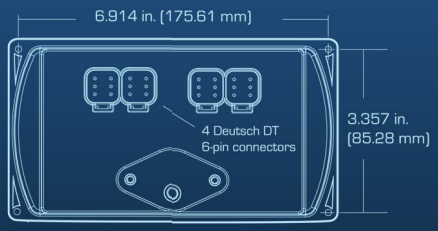

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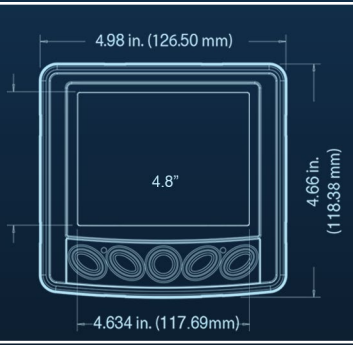

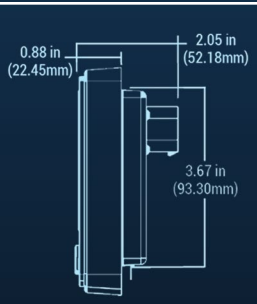

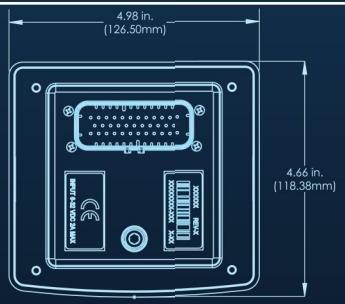

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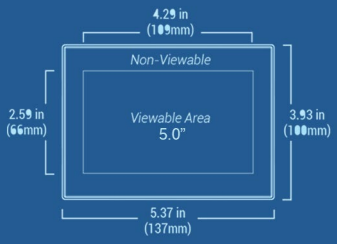
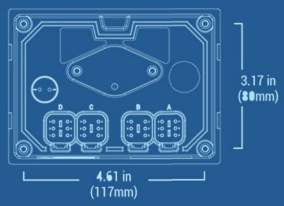
PV500





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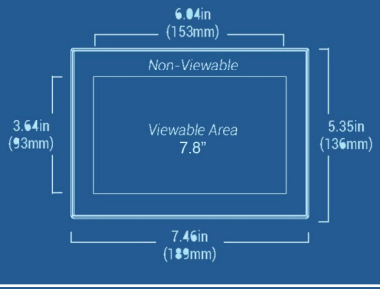

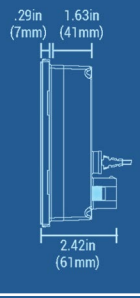

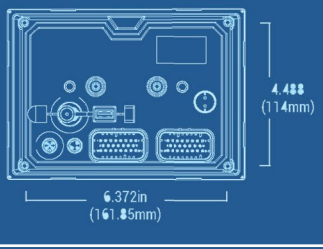

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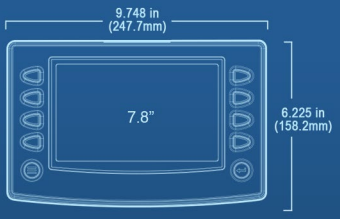

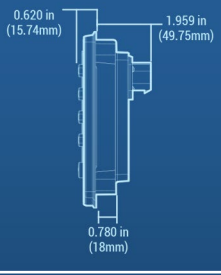

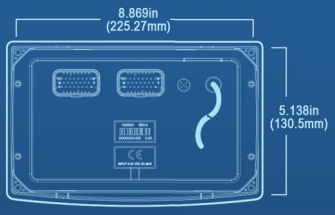

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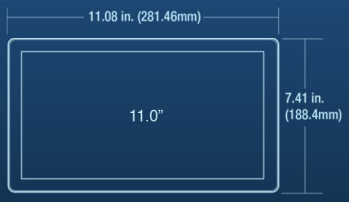

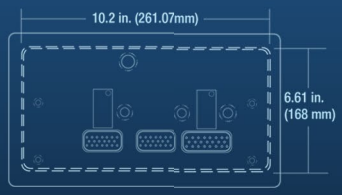

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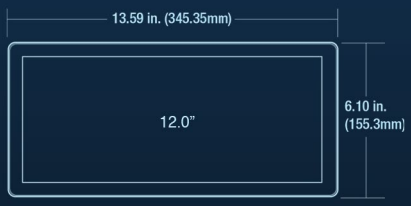

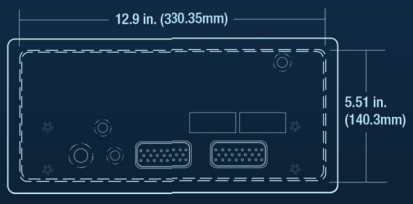

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TELEMETRY AND CONTROL MADE EASY

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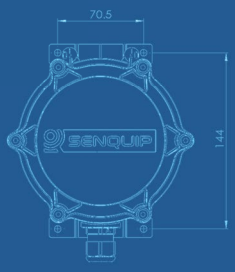
ENHANCED CONNECTIVITY SOLUTIONS

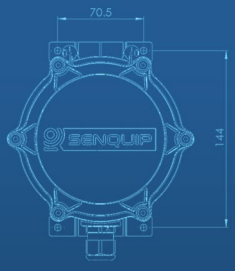
Designed and built in Australia, our Telemetry solutions provide remote monitoring and control of any engine or mobile machinery application. They act as a portal between your machinery, and the internet. Data is collected from the sensors and transmitted via the internet to a screen of your choice – laptop, iPhone, tablet, for you to make timely and critical decisions without being near the engine or machinery. Macquarrie Telemetry & IoT solutions are all compatible with our entire range of solutions for Engines and Machinery.

C1-G | J1939 & 4G



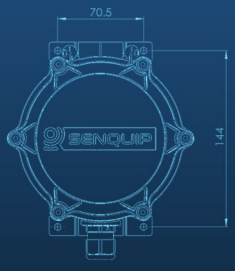
(1) CAT-M1 GSM network connection (3G/4G)
(1) Wi-Fi network receiver
(1) GPS + GLONASS reciever
(1) SAE J1939 Communications
(1) Digital Output
(2) Analog/Digital Inputs
(1) Thermocouple scanner

C1-W | J1939 & WI-FI



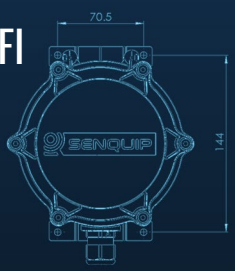
(1) Wi-Fi network receiver
(1) GPS + GLONASS reciever
(1) SAE J1939 Communications
(1) Digital Output
(2) Analog/Digital Inputs
(1) Thermocouple scanner

X1-G | RS485 MODBUS & 4G



(1) CAT-M1 GSM network connection (3G/4G)
(1) Wi-Fi network receiver
(1) GPS + GLONASS reciever
(1) RS232 & RS485 ModBus Communications
(1) Digital Output
(2) Analog/Digital Inputs
(1) Thermocouple scanner

X1-W | RS485 MODBUS & WI-FI



(1) Wi-Fi network receiver
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(1) RS232 & RS485 ModBus Communications
(1) Digital Output
(2) Analog/Digital Inputs
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IP67 CE RoHS

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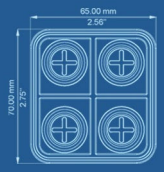
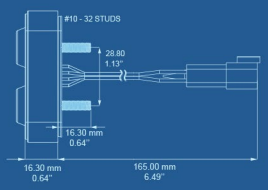
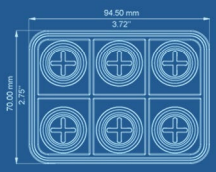
PKP-2200-SI

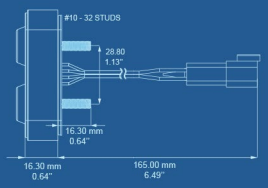




PowerKey Pro Keypad
4 SML button - 15mm DIA
J1939, CANOpen, or RS485
16-Option Multicolour LED Rings
IP67/IP69K

PKP-2300-SI





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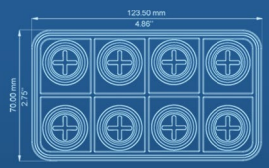
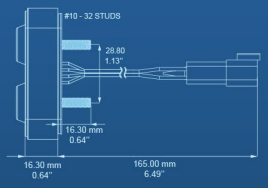
J1939, CANOpen, or RS485
16-Option Multicolour LED Rings
IP67/IP69K

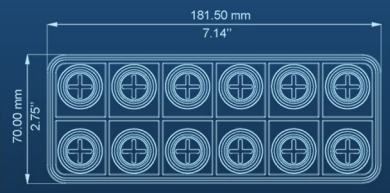
PKP-2400-SI

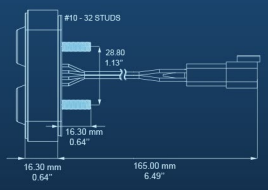




PowerKey Pro Keypad
8 SML button - 15mm DIA
J1939, CANOpen, or RS485
16-Option Multicolour LED Rings
IP67/IP69K

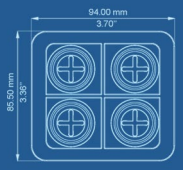
PKP-2600-SI

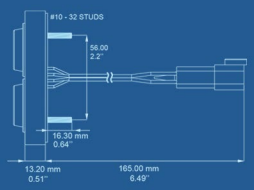




PowerKey Pro Keypad
12 SML button - 15mm DIA
J1939, CANOpen, or RS485
16-Option Multicolour LED Rings
IP67/IP69K

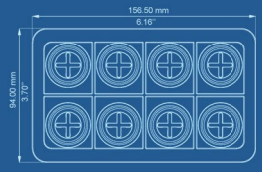
PKP-2200-LI

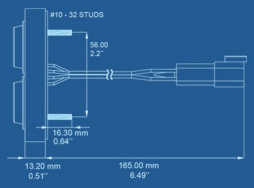




PowerKey Pro Keypad
4 LARGE button - 24mm DIA
J1939, CANOpen, or RS485
16-Option Multicolour LED Rings
IP67/IP69K

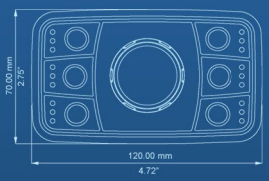
PKP-2400-LI

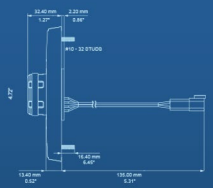




PowerKey Pro Keypad
8 LARGE button - 24mm DIA
J1939, CANOpen, or RS485
16-Option Multicolour LED Rings
IP67/IP69K

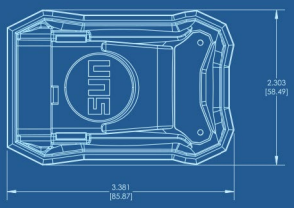
PWTR

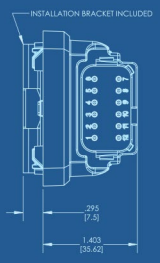




PowerTrack Rotary Encoder
6 Button + Rotary Encoder Pushbutton
20 Position Rotary Encoder
J1939, CANOpen
16-Option Multicolour LED Rings
IP67/IP69K

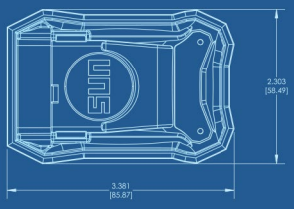
XMD-01

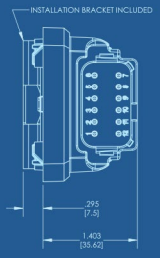




Single Joystick In & Valve Out Controller - Bluetooth Configurable
Inputs
(1) Analog - 0-5V, 0-10V, 4-20mA, pulse, frequency, PWM or digital
Outputs
(1) 5V reference for potentiometer/joystick controls
(1) PWM and Duty Cycle (0-100%)
(1) Configurable enable input
(1) SAE J1939 Communications

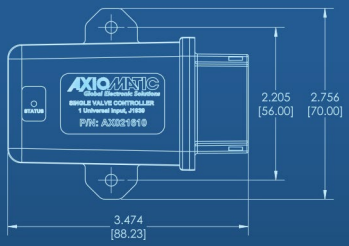
XMD-02

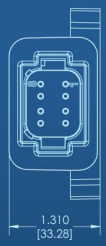




Dual Joystick In & Valve Out Controller - Bluetooth Configurable
Inputs
(2) Analog - 0-5V, 0-10V, 4-20mA, pulse, frequency, PWM or digital
Outputs
(2) 5V reference for potentiometer/joystick controls
(2) PWM and Duty Cycle (0-100%)
(1) Configurable enable input
(1) SAE J1939 Communications

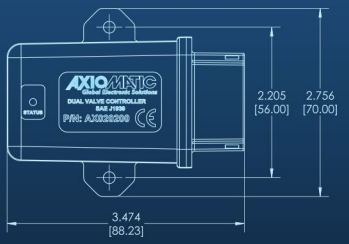
AX021610

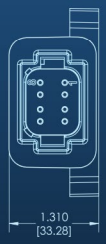




Single Output Valve Controller
Inputs
(1) Analog - Voltage, current, resistive, PWM, frequency or digital
Outputs
(1) 0V reference for outputs
(1) Proportional current 0-3A; Proportional voltage 0 - Vps; PWM, digital
(1) SAE J1939 Communications

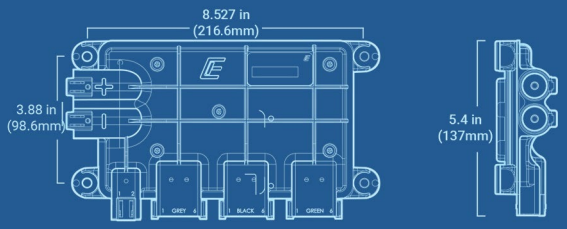
AX0020200





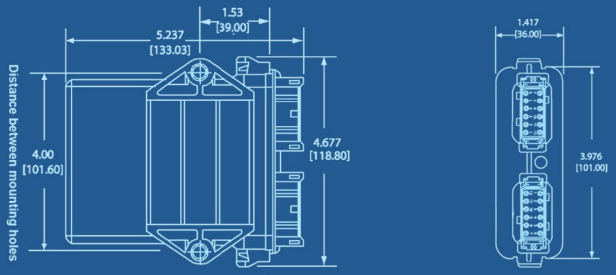
Dual Output Valve Controller
Outputs
(2) 0V reference for outputs
(2) Proportional current 0-3A; Proportional voltage 0 - Vps; PWM, digital
(1) SAE J1939 Communications

IX3212



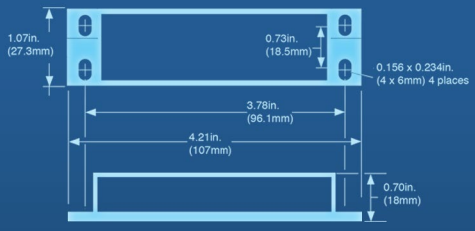
Complete Power Distribution Module
Inputs
(12) digital state (high side, low side, open)
(6) analog (0 -5 VDC),
(2) analog (resistive)
Outputs
(12) configurable as Hi-side, PWM or H-bridge (15 A each)

XM500



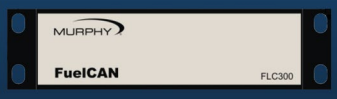
Analog & Digital Input Module
Inputs
(4) Digital (high side, low side)
(7) Analog - 0-5VDC, 4-20mA, Resistive, Digital
(1) Frequency (Hz)
Other
(1) Thermocouple Input: Type K & Type J
NB: Use of the (1) thermocouple input reduces number of Analog Inputs to (5)

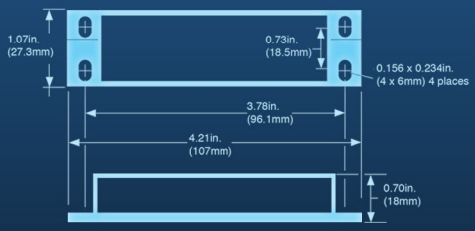
MeCAN



Mechanical Senders to J1939
Inputs
(1) Oil Pressure - ES(2)P Murphy
(1) Coolant Temperature - ES(2)T Murphy
(1) Speed - Magnetic Pickup - 10 - 180 Pulses/Rev
Outputs
(1) Shutdown (low side, 250mAa)

FuelCAN



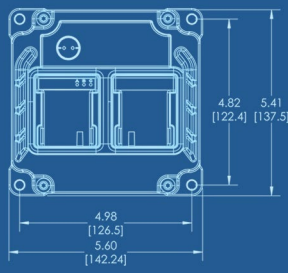


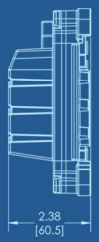
Fuel Senders to J1939
Inputs
(1) Fuel Sender - Ohms: 240 (empty) to 33.5 (full)
(1) Fuel Sender - Ohms: 240 (empty) to 30 (full)
(1) Fuel Sender - Ohms: 10 (empty) to 180 (full)

RUGGED MACHINE CONTROLLERS

Get the most out of any application with powerful, flexible and precise controllers. Featuring multiple CAN interfaces, extensive outputs and an available high-current output option, the complete family of uControl™ series controllers can handle any job, big or small.

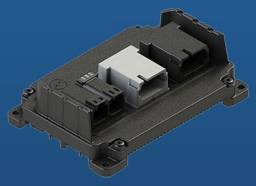
MC2-18-6

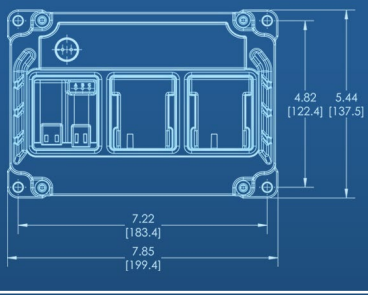


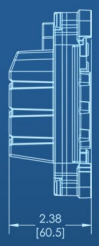


Inputs
(4) Universal Analog / High Frequency
(14) Universal Analog
(18) Total Inputs
Outputs (Software Selectable)
(2) 4A PWM (Feedback)
(4) Dual-Range PWM 4A / 0.5 A (Feedback)
(-) 15A PWM (Feedback)
(6) Total Outputs

MC3-21-10

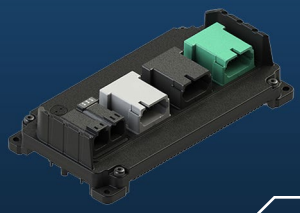


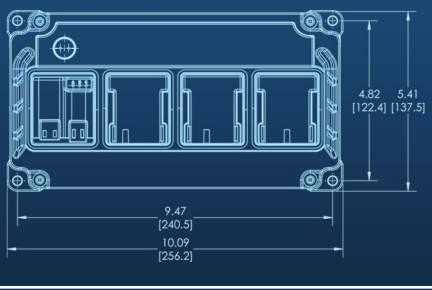




Inputs
(8) Universal Analog / High Frequency
(13) Universal Analog
(21) Total Inputs
Outputs (Software Selectable)
(6) 4A PWM (Feedback)
(4) Dual-Range PWM 4A / 0.5 A (Feedback)
(-) 15A PWM (Feedback)
(10) Total Outputs

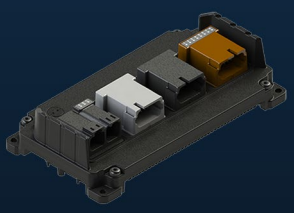
MC4-26-20

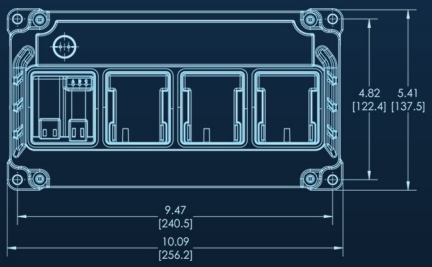




Inputs
(10) Universal Analog / High Frequency
(14) Universal Analog
(24) Total Inputs
Outputs (Software Selectable)
(10) 4A PWM (Feedback)
(10) Dual-Range PWM 4A / 0.5 A (Feedback)
(-) 15A PWM (Feedback)
(20) Total Outputs

MC4-21-14-H8





Inputs
(8) Universal Analog / High Frequency
(13) Universal Analog
(21) Total Inputs
Outputs (Software Selectable)
(6) 4A PWM (Feedback)
(8) Dual-Range PWM 4A / 0.5 A (Feedback)
(8) 15A PWM (Feedback)
(22) Total Outputs

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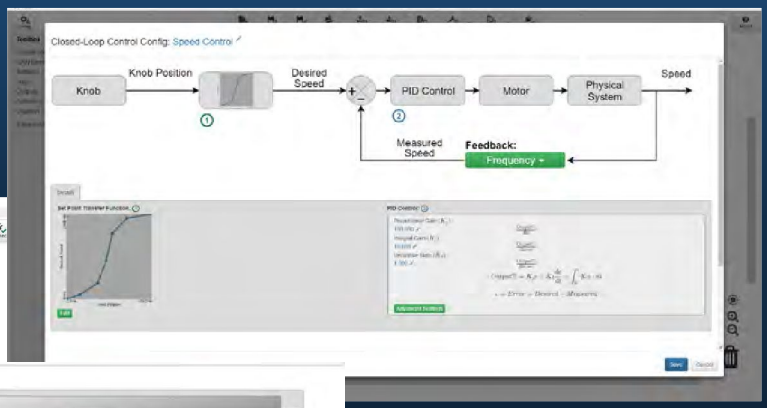

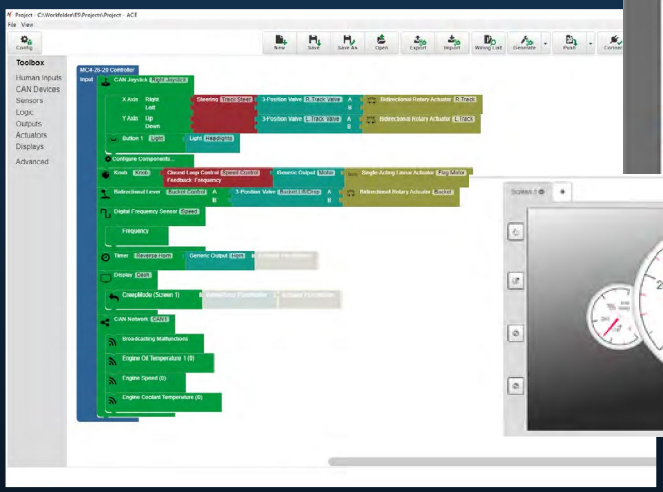

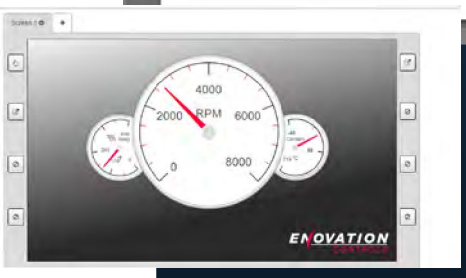

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Halogen Free

HMI DISPLAY SPECIFICATIONS

	PV1200	PV1100	PV780B	PV700	PV500	PV485	PV450
SCREEN SIZE	12.3 inches (320 mm x 130 mm)	10.6 inches (231.36 mm × 138.82 mm)	7-inches (178 mm)		5-inch (108 mm x 64.8 mm)	4.3 inches (109mm)	
RESOLUTION	1280 x 480	1280 x 768	800 x 480			480 x 272	
CONTRAST RATIO	Typ. 800:1	Typ. 1000:1	Typ. 600:1		Typ. 1000:1		
BRIGHTNESS	1000 cd/m²				900 cd/m²	900-1000 cd/m²	500-650 cd/m²
INTERFACE	Projected capacitive (PCAP) with glove touch		Projected capacitive (PCAP) with glove touch & 10 soft keys	Projected capacitive (PCAP) with glove touch		5 soft keys	8 soft keys
PROCESSOR	M2 with Arm® Cortex®-A15 dual-core CPU @ 1.5 GHz (32-bit)				RZ/G1E with Arm® Cortex®-A7 dual-core CPU @ 1.0 GHz (32-bit)	i.MX35 with Arm®-1136 CPU @ 532MHz (32bit)	
STORAGE	8 GB				1 GB	256 MB	
RAM	512 MB				256 MB	128 MB	
CONNECTORS	(2) AMPSEAL 23 pin (main)	(2) AMPSEAL 23 pin (main) (1) AMPSEAL 35 pin (optional)	(2) AMPSEAL 23 pin (main)	(2) AMPSEAL 23 pin (main) (1) M12 3 pin (optional)	(4) 6-position DEUTSCH® style DT series	(1) 35-pin AMP seal connector	(4) Deutsch DT 6-pin connectors
	(1) M12 5 pin [Ethernet] (optional)	(1) M12 5 pin [Ethernet] (optional)	(1) M12 5 pin [Ethernet] (optional)	(1) M12 5 pin [Ethernet] (optional)			
	(1) USB pigtail	(1) USB pigtail (1) Radio antenna jack (optional)	(1) USB pigtail	(1) USB pigtail (1) Antenna connector pigtail (optional)			
CAN	(2) CAN 2.0B according to ISO 11898-2, J1939 and proprietary messaging						(2) CAN 2.0B, J1939 (Optional NMEA 2000 isolation)
SERIAL	RS-485 serial (Modbus: master or slave)						
CONNECTIVITY	Ethernet (optional), Wi-Fi (optional), Bluetooth (optional)				Bluetooth (optional)		
INPUTS	(3) Analog 0–5 VDC, 4-20 mA, resistive, 10-bit resolution				(1) Analog 0-5VDC, 4-20mA, or resistive, 10-bit resolution	(4) Analog 0–5 VDC, 4–20 mA (2) Analog, battery voltage	(1) Analog 0–5 VDC, 4–20 mA, resistive
	(5) Discrete digital, active-high				(2) Discrete digital, active-high	(3) Discrete digital (1) Alternator and Magnetic Pickup	
	(1) Frequency in (2Hz–10kHz) 5V pk-pk min, 49V pk-pk max			(1) Frequency in (2Hz–10kHz) 5V pk-pk min, 120V pk-pk max			
	(3) NTSC/PAL video (single channel viewable)			(4) NTSC/PAL video (single channel viewable)	(2) NTSC/PAL video (single channel viewable)	(3) NTSC/PAL video (single channel viewable)	
OUTPUTS	(1) 500 mA switched low-side (1) Frequency output (2Hz–3KHz)				(2) 500 mA switched low-side	(4) 500 mA switched low-side (1) Analog 0–5 VDC	(1) 500 mA switched low-side

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