



Divelbiss Corporation

Design & Manufacture of off-the-shelf and custom Programmable Logic
Controllers, Electronics & Internet of Things (IOT) Devices
1-800-245-2327

August 30, 2017

Divelbiss E-News - August 2017

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Working For You - Product Design - Concept to Delivery

With over 40 years experience in electronic design and development, Divelbiss has a history of developing successful products for our customers. From product concept to specification, design through production, we are with you each step of the way providing information, expertise and experience.

Product Concept to Specification

The Divelbiss Engineering team works with you to to develop product specifications from your exact needs including but not limited to functional requirements, new features, and product packaging. These specifications become a road map to your final product; ensuring your final product meets your exact requirements.

We work with you to understand your product and process. We use this knowledge to brainstorm product features, current needs, future needs and to enhance product specifications to balance features versus cost. Working together brings you a product with features your customers want and need today as well as tomorrow, giving you the advantage over your competitors.



NMEA2000 Explained

What is NMEA2000, NMEA2K,
N2K?

NMEA2000 is a Plug and Play Communications standard connecting sensors, displays and other devices on ships and boats over a CAN network. NMEA2000 is based on SAE J1939 with specific messages for marine environment.

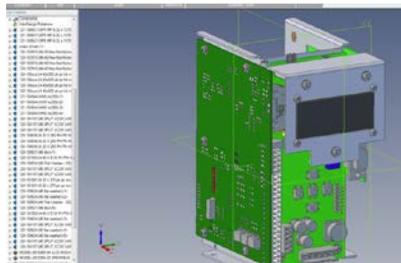
As with SAE J1939, NMEA2000 messages are sent as packets that are made up of a header followed by a 8 bytes of data (typical). The header of the packet specifies the transmitting device, the device which the message is intended for, the message priority and the PGN (Parameter Group Number). The PGN indicates which message is being sent, and thus how the data bytes should be interpreted to determine the values of the data fields that the message contains.

All Divelbiss Corporation products based on the [P-Series](#) PLC-on-a-Chip support both NMEA2000 and SAE J1939 including a large library

[Specification to Delivery](#)

Using the specifications, we design your product including Electronic Design, Printed Circuit Board Layout, and Mechanical Design including 3-D Modeling. Once the design is completed, a prototype is manufactured and tested using our rigorous testing standards as well as any other testing requirements. A prototype is then delivered to you for your own testing and approval.

From hardware to software, we work with you each step of the way to give you the best product that meets your needs.



Contact Divelbiss Corporation to discuss your new product concept today 1-800-245-2327 sales@divelbiss.com

of PGNs. The user also has the ability to create their own custom PGNs if needed.

For more information about Divelbiss Corporation's SAE J1939 and NMEA2000 capable products contact Divelbiss Corporation's Tech Services Department to discuss your application.

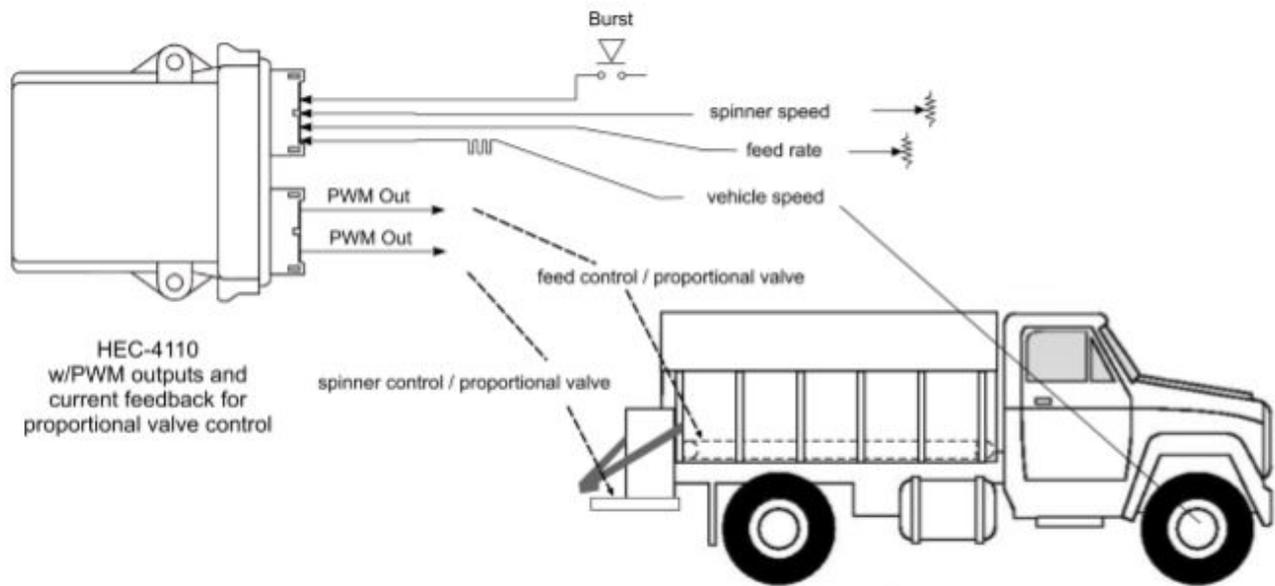
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[Application - Speed Compensated Material Spreading](#)

Application Description:

This application controls the spreading of material over an area using the [HEC-4110](#) controller. Vehicle speed is calculated and monitored (via pulses on a high speed counter input) and a feed rate auger is proportionally controlled based on the vehicle speed and a knob setting the feed rate. The feed rate is controlled based on the knob (potentiometer connected to an analog input) from 0-100% and based on speed from 0-30 MPH. If the rate is set to 100%, then at 15 MPH, the feed rate would be 50% and at 30 MPH the feed rate would be 100%. If the rate is set to 50%, then at 15 MPH, the feed rate would be 25% and at 30 MPH, the feed rate would be 50%.

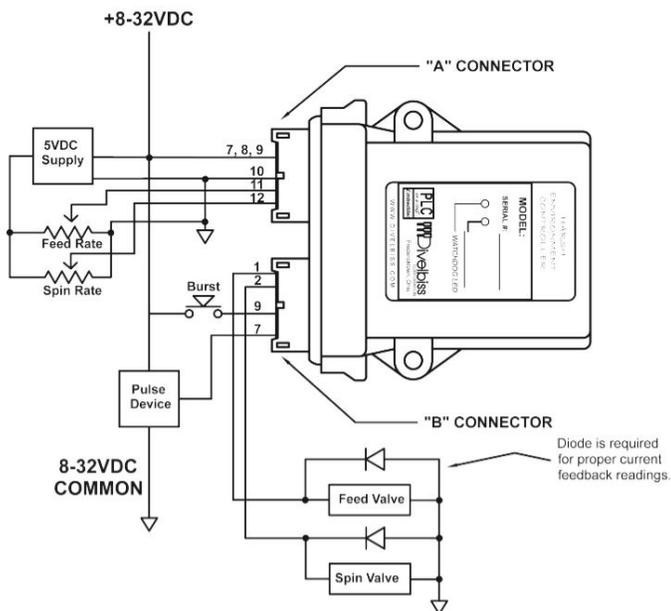


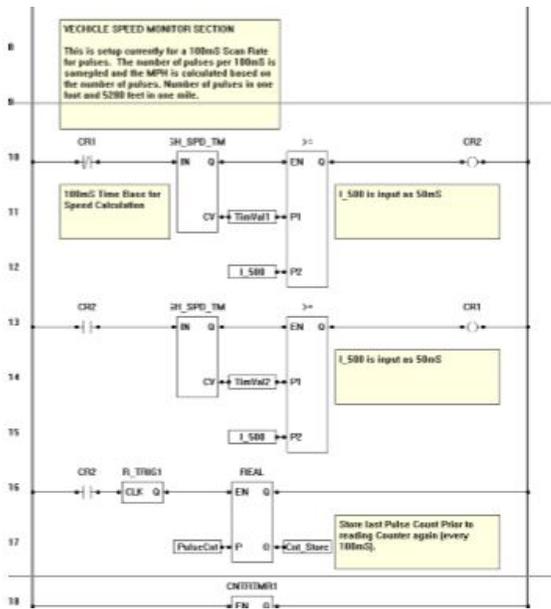
HEC-4110
w/PWM outputs and
current feedback for
proportional valve control

The feed rate is verified by measuring the proportional valve's coil current in a closed loop configuration. This current is used in a PID algorithm to control the Pulse Width Modulation for the proportional valve. As the vehicle moves, the auger speed / feed is automatically adjusted based on vehicle speed.

The spinner speed is set in the cab by potentiometer connected to an analog input. A Burst mode is included that will place the maximum amount of material (maximum feed rate) for as long as the burst button is pressed. The Spinner will operate normally in burst mode.

Connection Diagrams





For full Application and downloadable EZ Ladder Ladder Diagram [click here](#)

Product Highlight - HEC-P6000 Series Controllers

[HEC-P6000 Series Controllers](#)



The [HEC-P6000](#) Harsh Environment PLC with Ethernet, Serial Communications, Analog I/O, Digital I/O and Real Time Clock

The HEC-P6000 is based on the P-Series generation of [PLC on a Chip™](#). It is an ideal choice for applications where expanded Digital I/O, Analog I/O or communications are needed.

The HEC-P6000 Controller is a Harsh Environment Controller designed to withstand tough environments in mobile, wash-down and other areas. With an operating temperature of **-40° C to + 80° C**, the HEC-P6000 is ideal for nearly any environment.

Digital Inputs

The HEC-P6000 has a total of 14 digital inputs, with 8 dedicated digital inputs rated 8-32VDC that can be configured as sinking or sourcing. The 6 additional digital inputs are may be used as digital inputs or as counter / timer inputs (3 counter / timer and 3 quadrature counter). These counter channels are rated 8-32VDC and configurable as PNP/NPN.

Digital Outputs

The HEC-P6000 has total of 14 digital outputs, that are rated 8-32VDC up to 2A each. Up to 4 channels have current feedback monitoring via analog inputs for closed loop control. There are 4 groups of outputs (3 groups of 4 and 1 group of 2). The 3 groups of 4 may be used as on/off digital outputs or as Pulse Width Modulation (PWM) outputs while the group of 2 outputs is on/off digital output only. All the digital

outputs are sourcing and each group have independent power pins to allow output groups to operate at different voltage levels.

Analog Inputs

The HEC-P6000 has 4 field accessible Analog Inputs, each channel individually configurable as 0-5VDC, 0-10VDC or 0-20mADC with 12-bit resolution. There are 3 internal analog inputs dedicated for digital output current feedback and 1 internal channel that is configurable between digital output current feedback and input power monitoring.

Analog Outputs

The HEC-P6000 has 2 analog outputs rated 0-10VDC with 12-bit resolution. Each channel has internal span calibration potentiometers for field calibration, if field calibration is required.

Communications

The HEC-P6000 provides powerful communications with two on-board serial ports (RS232 or RS485) that can be used as simple printing, Modbus master or slave and can be used as communication ports to other devices with custom drivers by using structured text. Two CAN ports are provided that support **SAE J1939**, **NMEA 2000** and **OptiCAN**. The on-board **Ethernet** port may be used as a programming port or can be used with Modbus TCP.

The HEC-P6000 supports VersaCloud M2M Solutions and using VersaCloud M2M, the HEC-P6000 including devices / equipment connected to the HEC-P6000 may be monitored and controlled locally using Modbus TCP over Ethernet (Client/Server) or remotely with [VersaCloud M2M](#) using any internet connected device such as a tablet, computer or smart phone through a [VersaCloud M2M Portal](#)* via the HEC-P6000's Ethernet port.

Additional Features:

Additional features include Real Time Clock, User programmable LEDs, 2 internal user programmable slide switches, FRAM retentive memory, EEPROM storage and a **Micro SD Card Socket** that may be used for software updates or **data logging**.

Additional Models:

[HEC-P6010](#) New! Harsh Environment Controller with expanded Analog Inputs and Outputs. Is VersaCloud M2M Enabled. HEC-P6000 Series Harsh Environment Controller (HEC) / PLC with 14 Digital Inputs / 14 Digital Outputs (8-32VDC), 4 analog inputs (0-20mA/0-5VDC/0-10VDC), 2 Analog outputs (0-10VDC), Ethernet (Modbus TCP), Cellular Data Modem, GPS Port, 2 CAN ports (SAE J1939, NMEA 2000, OptiCAN), up to 6 Counter / Timer Channels, Real Time Clock, 2 RS232/RS485 Serial Ports (Modbus Master & Slave) and Micro SD Card Interface. [VersaCloud M2M](#) Enabled.

[HEC-P6100](#) New! Harsh Environment Controller with expanded Analog Inputs and Outputs. Is VersaCloud M2M Enabled. HEC-P6000 Series Harsh Environment Controller (HEC) / PLC with 14 Digital Inputs / 14 Digital Outputs (8-32VDC), 4 analog inputs (0-20mA/0-5VDC/0-10VDC), 2 Analog Outputs (0-10VDC), 2 CAN ports (SAE J1939, NMEA 2000, OptiCAN), up to 6 Counter / Timer Channels and MicroSD Card Interface.

[HEC-P6110](#) New! Harsh Environment Controller with expanded Analog Inputs and Outputs. Is VersaCloud M2M Enabled. HEC-P6000 Series Harsh Environment Controller (HEC) / PLC with 14 Digital Inputs / 14 Digital Outputs (8-32VDC), 4 analog inputs (0-20mA/0-5VDC/0-10VDC), 2 Analog Outputs (0-10VDC), 2 CAN ports (SAE J1939, NMEA 2000, OptiCAN), Cellular Data Modem, up to 6 Counter / Timer Channels and MicroSD Card Interface. [VersaCloud M2M](#) Enabled.

[HEC-P6200](#) New! Harsh Environment Controller with expanded Analog Inputs and Outputs. Is VersaCloud M2M Enabled. HEC-P6000 Series Harsh Environment Controller (HEC) / PLC with 14 Digital Inputs / 14 Digital Outputs (8-32VDC), 4 analog inputs (0-20mA/0-5VDC/0-10VDC), 2 Analog Outputs (0-10VDC), Wi-Fi Connectivity, GPS Port, 2 CAN ports (SAE J1939, NMEA 2000, OptiCAN), up to 6 Counter / Timer Channels, Real Time Clock, 2 RS232/RS485 Serial Ports (Modbus Master & Slave) and MicroSD Card Interface. [VersaCloud M2M](#) Enabled.

[HEC-P6210](#) New! Harsh Environment Controller with expanded Analog Inputs and Outputs. Is VersaCloud M2M Enabled. HEC-P6000 Series HEC Controller / PLC with 14 Digital Inputs / 14 Digital Outputs (8-32VDC), 4 analog inputs (0-20mA/0-5VDC/0-10VDC), 2 Analog Outputs (0-10VDC), Wi-Fi Connectivity, GPS Port, Cellular Data Modem, 2 CAN ports (**SAE J1939**, **NMEA 2000**, **OptiCAN**), up to 6 Counter / Timer Channels, Real Time Clock, 2 RS232/RS485 Serial Ports (Modbus Master & Slave) and MicroSD Card Interface. [VersaCloud M2M](#) Enabled.

Maritime Fun Facts

- Canada has the longest coastline of any country 56,453 miles.
- Yachting became a Olympic event in 1896 at the games in Greece.
- Where does the term "Son of a gun" come from?
 - On historic sailing ships women were occasionally smuggled aboard. If these women became pregnant they would traditionally give birth between the ships cannons on the gun deck. So the child was entered into the ships log as a son of a gun.
- The RMS Titanic was the world's largest passenger ship when it entered service, measuring 269 metres (882 feet) in length, and the largest man-made moving object on Earth. The largest passenger vessel is now Harmony of the Seas, at 362.12 metres.
- Between 850-1000AD the Vikings explored many different countries including; The British Isles, France, Spain, Italy and North Africa. They then travelled west towards the North Atlantic where they discovered Iceland, Greenland and Newfoundland

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