

# Data Sheet 13RA2BX5 Controller

## ELECTRICAL CHARACTERISTICS

### Absolute Maximum Ratings†

Battery (B+)	33V
All digital inputs with respect to ground	± 200V @ 15% D.C.
All analog inputs with respect to ground	± 90V
RS-485 signal pins	± 250mA
Frequency input	-0.7V to 33V
Outputs (back feed condition)	Battery +0.7V
Storage temperature	-65°C to +150°C
Ambient temperature with power applied	-40°C to +85°C
ESD protection on all pins	≥ 4 kV

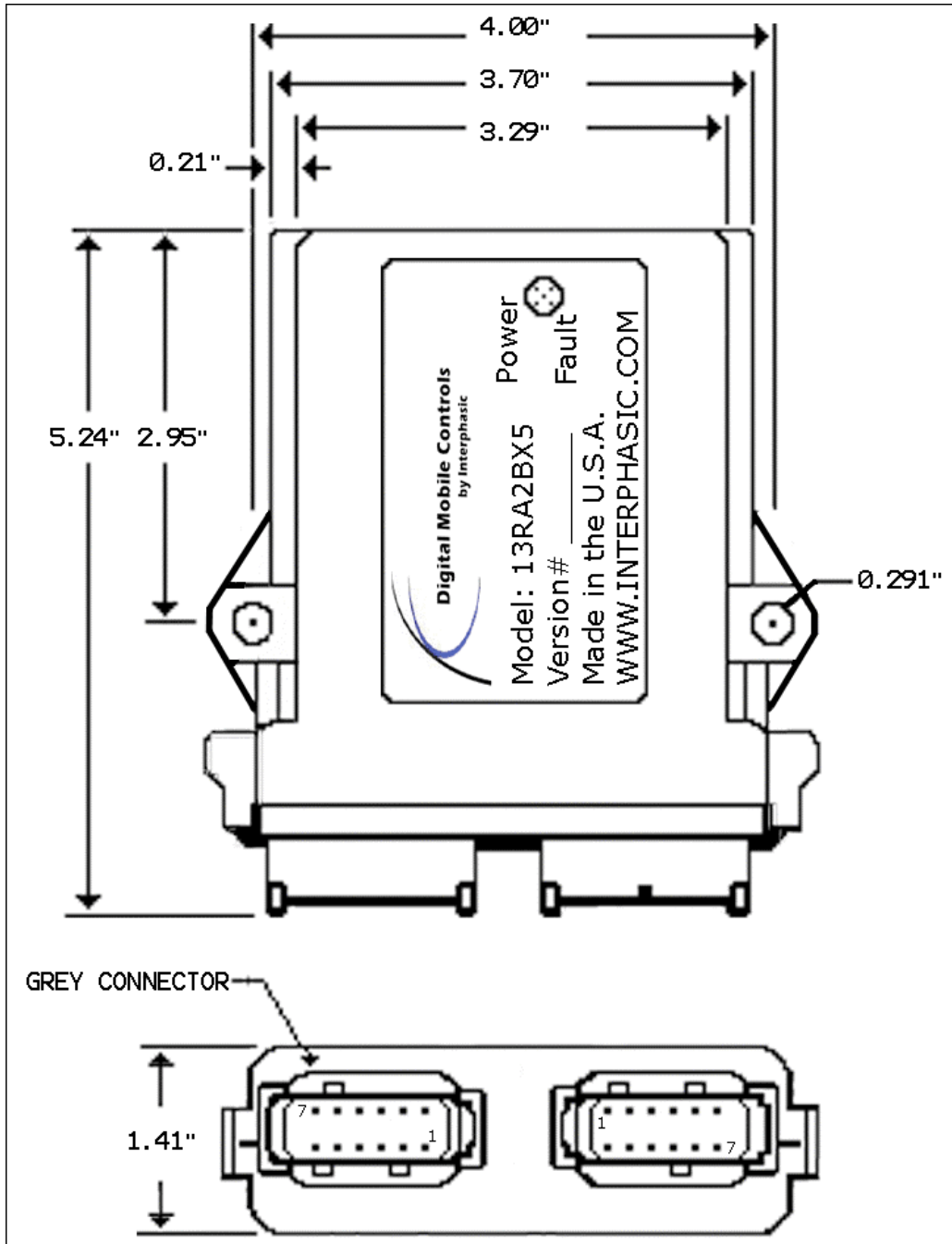
† **NOTICE:** Stress above those listed under “Absolute Maximum Ratings” may cause permanent damage to the controller. This is a stress rating only and functional operation of the controller at these or any other conditions above those indicated in the operational listings of this specification is not implied. Exposure to Absolute Maximum Rating conditions for extended periods may affect controller reliability.

**Specifications:** This is a LEAD-FREE (Pb) assembly.



Power supply input - nominal	9-30 VDC
Reverse polarity protection	Yes
Transient suppression	1500W@35 VDC
<b>Digital inputs</b>	All digital inputs active high
Input voltage span	± 30 VDC
Input impedance	3.3KΩ
High-level input voltage threshold (1)	≥ 3.1 VDC
Low-level input voltage threshold (0)	≥ 1.35 VDC
<b>Analog inputs</b>	
Input voltage span	0-5 VDC
Input impedance	50KΩ
Cutoff Frequency filter pole location	-3dB/Dec @90Hz
<b>Frequency input</b>	
Input voltage span	-0.7 to 33 VDC Clamped
Maximum amperage at clamped voltage (33 VDC)	33mA
Input impedance	3.3KΩ

High-level input voltage threshold	$\geq 2.75$ VDC
Low-level input voltage threshold	$\leq 1.75$ VDC
Hysteresis of input voltage	$\geq 1$ VDC
Frequency bandwidth	0 to 100Khz
<b>Outputs</b>	
Number of outputs	5
Short proof protected	Yes
Driver resistance	.038 $\Omega$
Nominal drive current	3 Amp RMS
Peak drive current	35 Amps for 3 seconds @ 25°C
Inductive clamping	Diode
Programmable PWM signal outputs	4
PWM bandwidth	0 to 33Khz
PWM resolution	10 bits; depending on frequency
PWM inductive clamping	Diode or Resistor + Diode
<b>Communications</b>	
EIA RS-485 communication ports	2
Baud rates	1200 to 1250K baud
Maximum sink current on TX /RX pins	250mA
Maximum source current on TX /RX pins	250mA
Maximum network nodes	64
RS-485 termination is standard pre-bias	120 $\Omega$ optional
<b>General specifications</b>	
Battery voltage monitor	9-30 VDC
Status LED	RED/GREEN
DIP switch	4 position
Controller weight	9.4 oz
<b>Microprocessor: Microchip (RISC)</b>	
Frequency of operation	20Mhz
Execution time	200nS
Controller quiescent current	18mA
Controller logic family	100% CMOS
<b>Environmental</b>	
Nylon 6/6 thermoplastic sealed housing	IP67 rated
Environmental design practices for electronic equipment	SAE J1455
EMC, transient, shock, vibration design practices	SAE J1113
Flame retardant classification	UL 94V-0



**Connection Detail**

Grey Connector Pins:

Black Connector Pins:

1 = INPUT 1	7 = COM1 A	1 = OUTPUT 1	7 = GND
2 = INPUT 2	8 = COM1 B	2 = OUTPUT 2	8 = FREQ IN
3 = INPUT 3	9 = INPUT 5	3 = OUTPUT 3	9 = INPUT 12
4 = INPUT 4	10 = INPUT 6	4 = OUTPUT 4	10 = INPUT 11
5 = COM2 B	11 = INPUT 7	5 = OUTPUT 5	11 = INPUT 10
6 = COM2 A	12 = INPUT 8	6 = B+	12 = INPUT 9

Analog inputs are "INPUT 11 & INPUT 12". Configure internal controller header for use.