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Trimble VM420 Valve Drive Module

CAN (SAE J1939) driver for PWM and PT applications



General Description

The Trimble® VM420 Valve Drive Module offers dual control channels for driving proportional pulse width modulated (PWM) and proportional time (PT) valves. The industry-standard J1939 CAN interface provides quick and easy system integration.

J1939 CAN Interface – The J1939 CAN system sets the industry standard and features open architecture. The system interface enables easy “plug and play” integration of the VM420 into your system.

Built to Last – The VM420 is built to deliver reliable, long-lasting performance in the on-machine environment where extremes of temperature, vibration, moisture and dust are the norm. Designed to the toughest OEM standard in the industry, the VM420 delivers even in the harshest conditions.

Standard Features

- J1939 CAN industry-standard interface
- Dual valve control channels with load sense output
- Control Box allows customizable proportional pulse width modulated (PWM) and proportional time (PT) valve types
- Control Box can select Vickers, Parker, Bosch, Rexroth, Pilot Series II, and Custom valve types
- Network connector – 10-pin bulkhead connector
- Valve connector – 10-socket bulkhead connector
- Flash updateable firmware
- 100% sealed aluminum housing

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Specifications

Physical characteristics	Specifications
Size	Length: 213 mm (8.4") Width: 89 mm (3.75") Height: 64 mm (2.5")
Weight	<1 kg (2.2 lb)
Mounting Holes	8.7 mm (0.34" diameter; 4 holes)
Hole Spacing	Width – 70 mm (2.75"); Length – 194 mm (7.63")
Weight	<1kg (2.2 lbs)

Environmental characteristics	Specifications
Temperature	Operating: -40°C to +85°C (-40°F to +185°F) Storage: -50°C to +120°C (-58°F to +248°F)
Humidity	100%, fully sealed, weatherproof
Sealing	Environmentally sealed to 34.48 kPA (5 psi) IP68
System Level EMC	Emissions: Compliant with CE (Exceeds ISO 13766) Susceptibility: Compliant with CE (Exceeds ISO 13766)

Technical characteristics	Specifications
Electrical Input Voltage	9 to 32 VDC
Control Interface	SAE J1939 CAN
Reverse Voltage Protection	Yes, to 36 VDC
Load Dump Protected	Yes, compliant to ISO 7637 specifications
Short Circuit Protected	Yes

Functional Characteristics	Specifications PWM Valves	PT Valves
Working range	0-4 amps	0-100% duty cycle
Stability (Pk-Pk)	<100 mA	<2% duty cycle
Response Time	<60 ms	<2 ms
Accuracy	±40 mA or ±5% of setpoint whichever is greater	±1% maximum pulse width
Repeatability	< 10 mA	<2% duty cycle
Resolution	4 mA	±0.1% maximum pulse width
Latency	≤3 ms	≤3 ms
Maximum Bandwidth	50 Hz	50 Hz

10-socket VM420 Network Connector

Pin	Signal	Description	Direction
A	SWPWR	Switched Power	Input
B	SELECT_A	Function Instance Select "A"	Input
C	CAN0_H	CAN HIGH	I/O
D	CAN0_L	CAN LOW	I/O
E	SELECT_B	Function Instance Select "B"	Input
F	PWRGND1	Power Ground	Output
G	N/C	-	
H	N/C	-	
I	N/C	-	
J	N/C	-	

10-socket VM420 Valve Connector

Pin	Signal	Description	Direction
A	RTVAL_EXT	Right valve extend	Output
B	RTVAL_RET	Right valve retract	Output
C	RTVAL_RTN	Right valve return	Input
D	N/C	-	
E	N/C	-	
F	LTVAL_EXT	Left valve extend	Output
G	LTVAL_RET	Left valve retract	Output
H	LTVAL_RTN	Left valve return	Input
I	LS+	Load Sense +	Output
J	LS-	Load Sense -	Input