

IO 420

PROGRAMMABLE FOUR-CHANNEL, H-BRIDGE, PWM MOTOR CONTROLLER

DESCRIPTION

The IO 420 is a programmable four-channel, H-Bridge, PWM motor controller. The controller is used as a companion component to Appareo Gateway Telematic Control Unit (TCU) products to actuate hydraulics, spin motors, receive sensor feedback, and interface to system components over a CAN interface. It supports 5A per channel, provides frequency/analog/digital feedback, and is programmed through CAN.



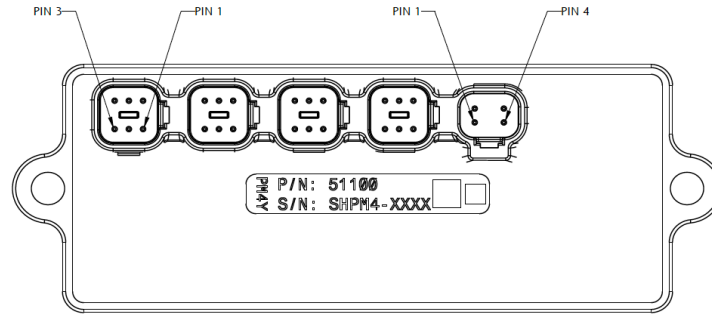
APPLICATIONS

The IO 420 was developed to drive DC motors and hydraulic valves on heavy machinery and agricultural implements. Its rugged design allows it to operate in harsh environmental conditions. The IO 420 integrates seamlessly with an Appareo Gateway, connecting to one of its six CAN ports.

FEATURES

- Four 5A, H-Bridge, PWM motor controllers
 - H-Bridge controllers can be ganged, allowing two 10A motor controllers
- Eight configurable inputs (2 per bank) for:
 - Analog input
 - Digital input
 - Frequency/rotary encoder
- Integrated speed control using input feedback
- 0% to 100% PWM operation per channel
- Bidirectional motor control with H-Bridge outputs
- Control Area Network (CAN) interface
- Automatic discovery and operation in Gateway ecosystem
- Engineered to IP69K environmental ratings

INPUT/OUTPUT



Connector: Pin	I/O	Function
PIN: 1	CAN_HIGH	CAN Bus High
PIN: 2	CAN_LOW	CAN Bus Low
PIN: 3	VIN	Input Voltage (12 V)
PIN: 4	GND	Ground
POUT 1: 1	HBRIDGE1+	PWM Output 1 +
POUT 1: 2	HBRIDGE1-	PWM Output 1 -
POUT 1: 3	INPUT1A	Frequency/Analog/Digital Input 1A
POUT 1: 4	INPUT1B	Frequency/Analog/Digital Input 1B
POUT 1: 5	DO1	Digital Out 1
POUT 1: 6	GND	Ground
POUT 2: 1	HBRIDGE2+	PWM Output 2 +
POUT 2: 2	HBRIDGE2-	PWM Output 2 -
POUT 2: 3	INPUT2A	Frequency/Analog/Digital Input 2A
POUT 2: 4	INPUT2B	Frequency/Analog/Digital Input 2B
POUT 2: 5	DO2	Digital Out 2
POUT 2: 6	GND	Ground
POUT 3: 1	HBRIDGE3+	PWM Output 3 +
POUT 3: 2	HBRIDGE3-	PWM Output 3 -
POUT 3: 3	INPUT3A	Frequency/Analog/Digital Input 3A
POUT 3: 4	INPUT3B	Frequency/Analog/Digital Input 3B
POUT 3: 5	DO3	Digital Out 3
POUT 3: 6	GND	Ground
POUT 4: 1	HBRIDGE4+	PWM Output 3 +
POUT 4: 2	HBRIDGE4-	PWM Output 3 -
POUT 4: 3	INPUT4A	Frequency/Analog/Digital Input 4A
POUT 4: 4	INPUT4B	Frequency/Analog/Digital Input 4B
POUT 4: 5	DO4	Digital Out 4
POUT 4: 6	GND	Ground

ABSOLUTE MAXIMUM RATINGS

Stresses beyond those listed under Absolute Maximum Ratings may cause permanent damage to the device. Exposure to any Absolute Maximum Rating condition for extended periods may affect device reliability and lifetime.

Parameter	Value	Unit
VIN to GND	-13.6 to 26.5	V
CAN+, CAN-, to SGND	- 0.3 to 16.5	V
CAN+, CAN-, to VIN	- 0.3 to 16.5	V
CAN+ to CAN-	- 0.3 to 16.5	V
Configurable Input to GND	-0.3 to 16.5	V
Storage Temperature	-55 to 105	°C
Operating Temperature	-40 to 75	°C

ELECTRICAL SPECIFICATIONS

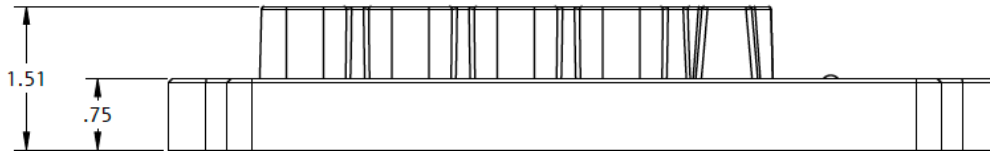
Symbol	Parameter	Min	Typ	Max	Unit
POWER SUPPLY					
I _{IN}	Input current			13	A
V _{CC}	Supply voltage	9	13.8	16	V
t _{STARTUP}	Start-up time from power-on		< 1	15	second
CAN BUS					
V _{IH, CAN}	Input high voltage	5			V
V _{IL, CAN}	Input low voltage			0.8	V
f _{CAN}	CAN BAUD Rate	125		500	Kbps
H-BRIDGE POWER OUTPUT					
I _{OUT}	Output current (100% duty cycle)			5	A
f _{OUT}	Output frequency range	100		5000	Hz
f _{STEP}	Output frequency increments		100		Hz
D _{COUT}	Output duty cycle range	0		100	%
D _{CSTEP}	Output duty cycle increments		2		%
H-BRIDGE OUTPUT CURRENT SENSE					
I _{CS, RANGE}	Current sense range	-5		5	A
I _{CS, ERROR}	Current sense error			0.15	A
H-BRIDGE CURRENT LIMITING					
I _{LIM}	Active current limiting threshold	5.2	6.5	7.8	A
I _{SCH}	High-side short circuit detection threshold	11			A
I _{SCL}	Low-side short circuit detection threshold	8			A
DIGITAL OUTPUT (8 - 16 VDC)					
I _{12VDC, OUT}	Digital output current			100	mA
I _{12VDC, CS}	Digital current sense precision		1		mA

ELECTRICAL SPECIFICATIONS

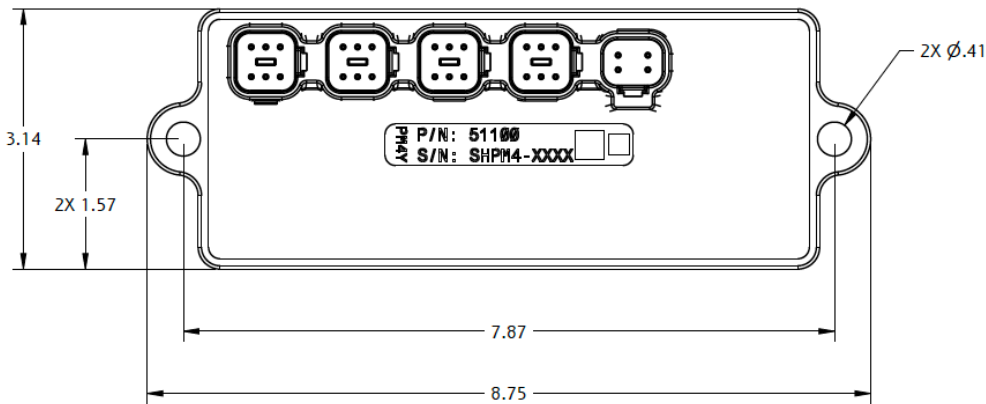
Symbol	Parameter	Min	Typ	Max	Unit
CONFIGURABLE INPUT					
f_{IN}	Input frequency range	16.6		5,000	Hz
f_{ERROR}	Input frequency error: 16.6 to 120 Hz 120.1 to 826.0 Hz			0.167 2	Hz %
$V_{IN, RES}$	Input voltage resolution		0.05		V
$V_{IN, CONFIG}$	Input voltage range	0.0		16.0	V

MECHANICAL

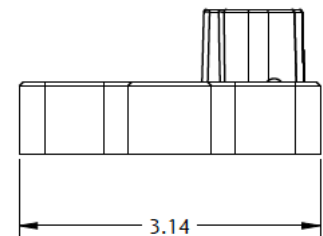
FRONT VIEW



TOP VIEW



SIDE VIEW



Measurement Units: Inches

Recommended Mating Connectors:

Deutsch DT06-045-E003
Deutsch DT06-065-E003

Mounting:

Do not mount IO 420 with connectors facing up.