CURTISS-WRIGHT

Williams Controls

Thumb Throttle and Switch Unit

WM-A10

- **Non-contacting throttle with Hall-effect switches**
- **Dual-redundant-output throttle signals**
- **Up to two return-to-center, 3-position switches**
- **Safety assured: each throttle circuit has dedicated 5V and ground supply connections**
- **Switch circuits powered by third set of 5V and ground supply connections**
- **Up to 4 LEDs for driver indication**
- **Integrated connector or flying lead**
- **Environmentally sealed to IP67**
- **Custom tooling service for a wide range of applications**

The WM-A10 provides an electronic thumb throttle and switch solution for a wide range of applications including All-Terrain Vehicles (ATV) or Personal Recreational Vehicles (PRV).

The throttle utilises two fully-independent non-contacting Hall-effect sensors to provide a dual-redundant-output architecture, with the second signal being a fixed relation to the main drive signal. A vehicle's Electronic Control Unit (ECU) can therefore perform comparisons between the throttle's two outputs, in order to ensure it is operating correctly. Both outputs are linear and are directly proportional to absolute sensor shaft rotation. In addition, each throttle sensor circuit has its own 5V and ground supply connections, thereby implementing a truly dual-redundant system.

Non-contacting sensing is also employed in design of the switches, which are momentary, center-off types and typically used to operate functions such as transmission shifting. Each switch has two outputs which are both at 5V in the center position, with one or the other switching to ground dependent left or right operations. To provide a further level of safety, the switch circuits have a third set of 5V and ground supply connections.

The design of the WM-A10 means it is exceptionally robust against many different environmental conditions, including: water immersion, pressure washing, salt spray, a variety of chemicals, dust and mud; while connection to the unit is via an industry-stand integrated connector or flying lead.

In addition to the control inputs, the throttle unit can house up to four LEDs, which can be used to indicate the status of vehicle functions to the driver.

The unit illustrated above is based on a customer-specific design, but Curtiss-Wright's teams of experienced engineers are on hand to provide a custom service to meet the individual requirements of vehicle OEMs. Please contact your Curtiss-Wright representative for further details.

SPECIFICATIONS

ABSOLUTE MAXIMUM RATINGS APS CIRCUIT	
SUPPLY VOLTAGE (V_{CC1}, V_{CC2})	-6.0Vdc to 6.0Vdc
OUTPUT CURRENT	10mA
OUTPUT SHORT-CIRCUIT DURATION TO GND	Indefinite
OUTPUT SHORT-CIRCUIT DURATION TO Vcc	Indefinite
ABSOLUTE MAXIMUM RATINGS ROCKER SWITCH CIRCUITS	
SUPPLY VOLTAGE (V_{CC1}, V_{CC2})	-6.0Vdc to 6.0Vdc
OUTPUT CURRENT	25mA
TEMPERATURE	
OPERATING TEMPERATURE	-40°C to 85°C

ELECTRICAL SPECIFICATIONS

Symbol	Parameter	Conditions	Minimum	Typical	Maximum	Units
V_{CC1}, V_{CC2}	APS Supply Voltage		4.5	5	5.5	V
V_{CC3}	Switch Supply Voltage		4.5	5	5.5	V
I_{CC1}, I_{CC2}	APS Supply Current	Per circuit		7	10	mA
I_{CC3}	Switch Supply Current				25	mA
V_{CT1}	CT Output, APS1	Programmed to customer requirements				
V_{WOT1}	WOT Output, APS1	Programmed to customer requirements				
V_{CT2}	CT Output, APS2	Programmed to customer requirements				
V_{WOT2}	WOT Output, APS2	Programmed to customer requirements				
CORRELATION	(0.5xAPS1–APS2)*100/V_{CC}	Normal loading	-2		2	%V_{CC}
LINEARITY	Overall Output Linearity				2	%
$Q3_{OUT}$	Rocker Switch Logic Level	Operate to the left to decrement	-0.25	0.1	0.25	V
$Q4_{OUT}$	Rocker Switch Logic Level	Operate to the right to decrement	-0.25	0.1	0.25	V
Q3 – $Q4_{OUT}$	Rocker Switch Logic Level	Center detent	4.75	4.9	5.25	V

REGULATORY VALIDATION	
FMVSS-302 FLAMMABILITY	Per US federal regulations
FMVSS-124 RTI CERTIFICATION	Per US federal regulations
ENVIRONMENTAL	
SEALING	IP67

For further specifications, please contact Curtiss-Wright.

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