

This TSLM is an automatic start controller and limiter for the M601 turboprop from Walter/GE.

To start an engine the operator momentarily depresses a toggle switch in one direction and to do a (dry) run operation, the other direction.

For a start the TSLM will activate the starter, ignition exciter, interrupter fuel valves as well as the limiting (EHT) valve as required to attempt to bring the engine to idle speed without operator intervention and without exceeding the inter turbine temperature (ITT). The latter should typically not exceed 700°C, if it does the TSLM will turn on the exceed annunciation light alerting the operator to abort by pulling the condition lever to cutoff.

For a run the TSLM will activate the starter to turn the engine a number of seconds and monitor N1.

During flight the TSLM monitors primary parameters ITT, N1, N2, and if needed torque. If any of them breach their maximums the TSLM will turn on the exceed annunciation light to alert the operator.

Also if the propeller is in beta then the TSLM will limit the propeller rpm (N2) to 1900 rpm or below.

By depressing the start/run switch in flight the operator can invoke anti-flameout operation whereby the TSLM as a precaution cycles the torches.

Each start, run and exceed event are recorded by the TSLM in a detailed graph format showing turbine temperature, N1, N2, voltage, and more versus time. This allows precise analysis after any event in order to make informed follow-up decisions.



The TSLM allows a number of diagnostic tests to be performed through it in order to quickly troubleshoot in isolation external wiring, switches, valves, etc.

The TSLM is available as part of one of our standard or custom master control units (MCU's) that includes contactors, shunts, and other VR Avionics products such as our starter-generator controller (SGC) that can support lithium batteries.

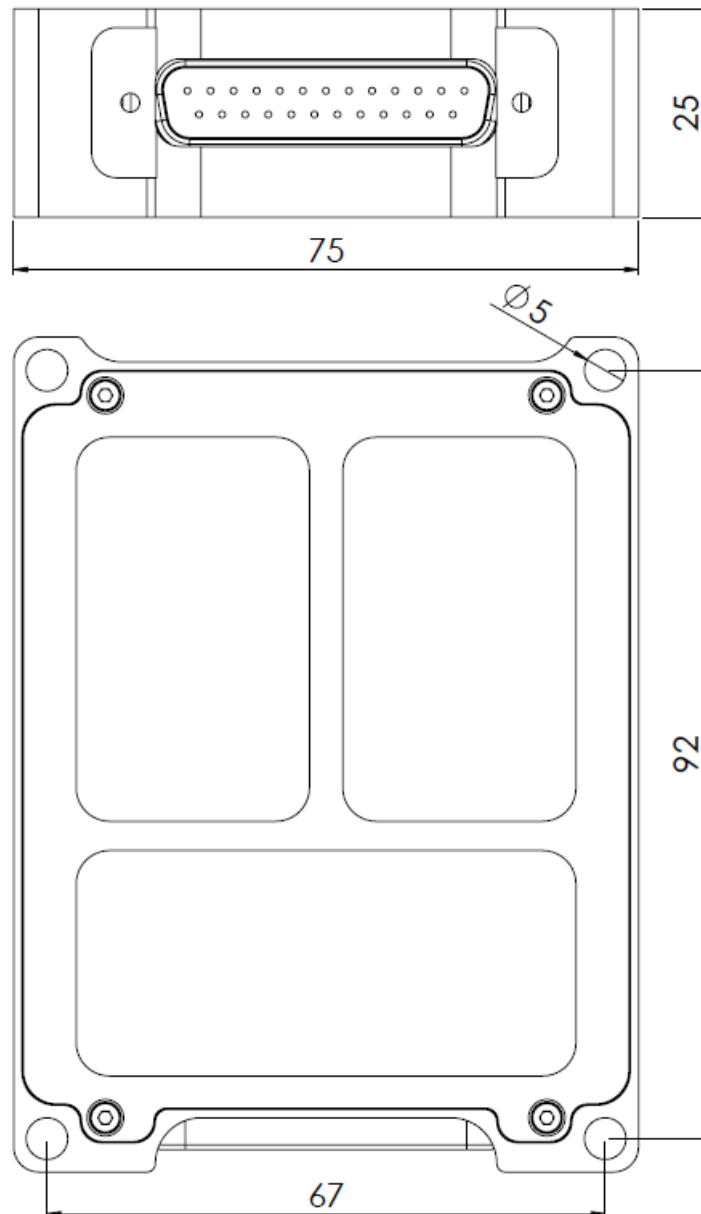
## Pin-outs (male 25-pin d-sub)

PINS	DIR	(TPE331)	DESCRIPTION
12,24	IN	POWER	AIRCRAFT POWER (28VDC)
13	GND	GROUND	AIRCRAFT GROUND
2	IN	N1	SPEED SENSOR 1 (TACHGEN)
15	IN	N2	SPEED SENSOR 2 (TACHGEN)
16	IN	TORQ	PRESSURE SENSOR 1 (4-20mA TRANSDUCER)
4	IN	OIL-PRESS	PRESSURE SENSOR 2 (4-20mA TRANSDUCER)
1	IN	ITT+	TEMPERATURE SENSOR 1 (K-TYPE THERMOCOUPLE +)
14	IN	ITT-	TEMPERATURE SENSOR 1 (K-TYPE THERMOCOUPLE -)
25	IN	OIL-TEMP+	TEMPERATURE SENSOR 2 (K-TYPE THERMOCOUPLE +)
17	IN	OIL-TEMP-	TEMPERATURE SENSOR 2 (K-TYPE THERMOCOUPLE -)
3	IN	VOLTS	SYSTEM BUS VOLTAGE SENSE
6	IN	BETA	DISCREET GROUNDING INPUT
20	IN	START	DISCREET GROUNDING INPUT
19	IN	RUN	DISCREET GROUNDING INPUT
11	OUT	IGN-A	12A SWITCHED POWER OUTPUT
22	OUT	IGN-B	12A SWITCHED POWER OUTPUT
10	OUT	INT	5A SWITCHED POWER OUTPUT
9	OUT	CONT+	5A SWITCHED POWER OUTPUT
7	OUT	EXCEED	5A SWITCHED POWER OUTPUT
8	OUT	EHT+	5A SWITCHED POWER OUTPUT
23	OUT	EHT-	5A SWITCHED GROUNDED OUTPUT
21	OUT	TSLM	5A SWITCHED GROUNDED OUTPUT
5	I/O	CAN-H	CAN BUS INTERFACE HIGH
18	I/O	CAN-L	CAN BUS INTERFACE LOW

## General Specifications

1	Operational Voltage Range	10 – 40 VDC
2	Operating Temperature Range	-40 to +85 °C
3	Max. Operating Altitude	55,000 feet
4	Dimensions	100 x 75 x 25mm
5	Weight	180 g
6	Power Consumption (no external loads)	50mA

## Unit Outline



1. The TSLM uses a 25-pin DSUB (M24308 series) male connector. The recommended mating receptacle (female) for it is the M24308/2-3
2. The unit is secured through four 5mm holes on each corner accepting AN3 bolts