Features

- Turbine auto-start control for simple and consistent starts
  - Lessens operator workload while freeing up one hand
  - Drives external Exceed light to guide the operator to:
    - abort the start if a hot-start is imminent, etc.
    - reduce in-flight power or adjust prop lever
  - Drives external electric fuel valve to:
    - control ITT curve during the start
    - control propeller speed (N2) when in beta mode
- Various auto-ignition / auto-relight or anti flame-out possibilities
- Full engine monitoring when combined with VRX display(s) with unmatched redundancy options
- Detailed event-driven or continuous in-flight recording
- Designed for easy retrofit as well as for new installs

Description

The TSLM brings auto-start control to gas-turbine engines equipped with electric fuel valves such as the Walter/GE M601 providing a simple and consistent platform to execute start procedures from. It not only lessens operator workload, but enables start-ups using just one hand on the condition/fuel lever, while the other hand can hold the flight control stick, etc.

For the M601 engine it does not only control the start-up at the flick of a switch, but it limits against ITT over-temperatures as well as excessive ITT rate-of-change during the start sequence, and in-flight it limits against propeller over-speeds when in beta (reverse thrust) mode.

Initiating a start the operator is guided by one light only, the Exceed light. Illumination of the Exceed light tells the operator to abort the start, which can be because the TSLM predicts a hot-start to be imminent or otherwise senses the existence of an unsafe condition.

In-flight the Exceed light also illuminates should any primary engine parameter (ITT, torque, N1, N2) exceed. The operator can then make the necessary adjustment to the power or prop lever to let the light to go out.

For normal standalone auto-starting only certain sensors need to be connected to the TSLM. The unit will however accept further sensors in order to work with one or more of our VRX displays to realize full engine monitoring. This arrangement can also provide some instrumentation redundancy against a single unit failure, however rare to occur, to at least leave the operator enough engine indication to "limp home" with.

The TSLM can record all engine parameters in up to $1/10^{th}$ of a second sample periods. Recordings can be continuous, or triggered to only cover certain events such as parameter exceeds and start sequences.

The TSLM easily retrofits to existing installations, requiring very little instrument panel alteration.

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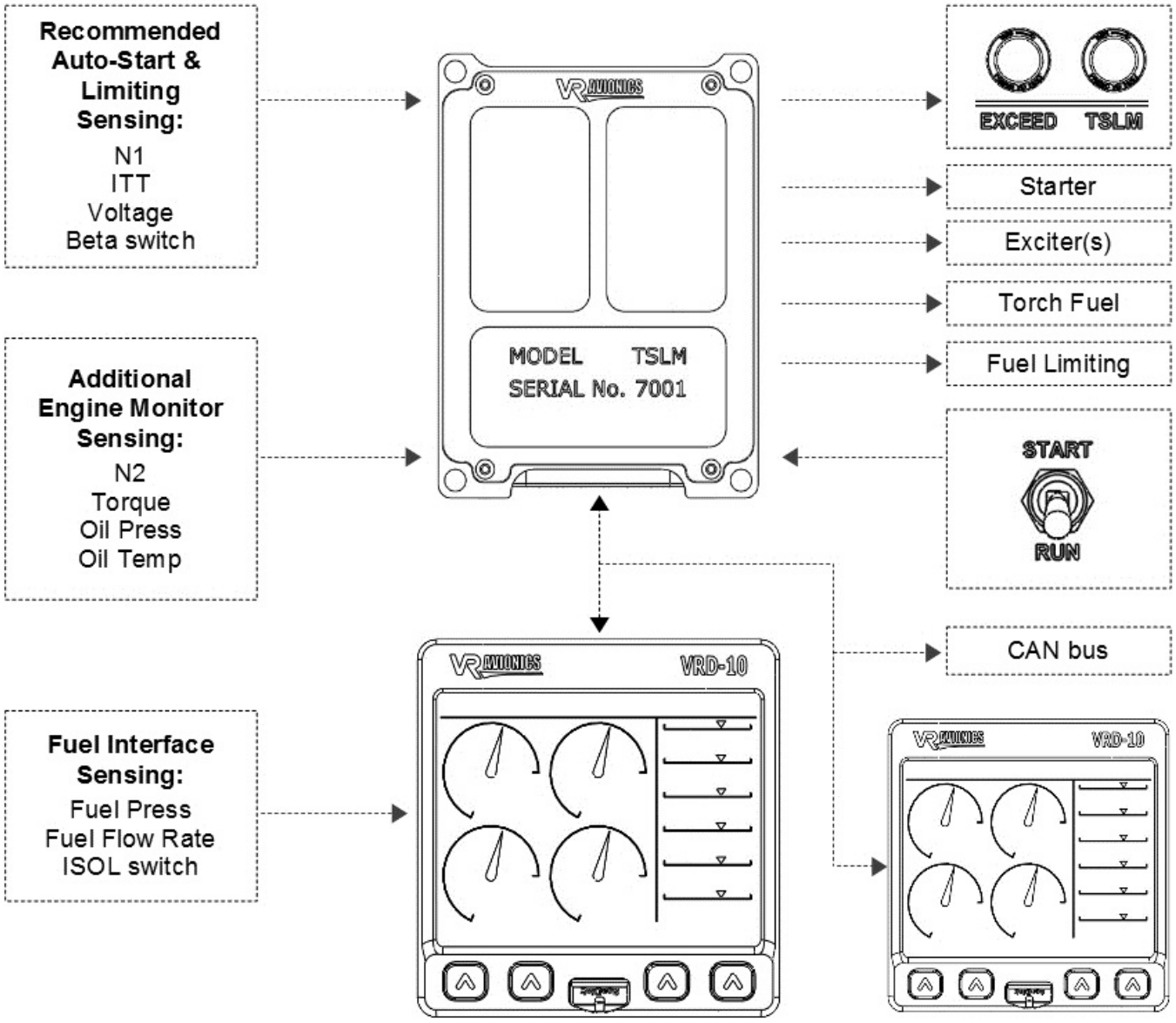
Block Diagram - Walter/GE M601 TSLM application



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

PINS	DIR	for M601	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
5,18	I/O	CAN	CAN BUS INTERFACE

Maximum Ratings

1	POWER SUPPLY VOLTAGE RANGE	10 TO 32 VDC
2	STORAGE TEMPERTURE	-55 TO +125 ºC
3	OPERATING TEMPERTURE	-40 TO +85 ºC

General Specifications

4	DIMENSIONS	100 x 75 x 25mm
5	WEIGHT	180 g
6	POWER CONSUMPTION (NOT SWITCHING ANY LOADS)	50mA (typical)

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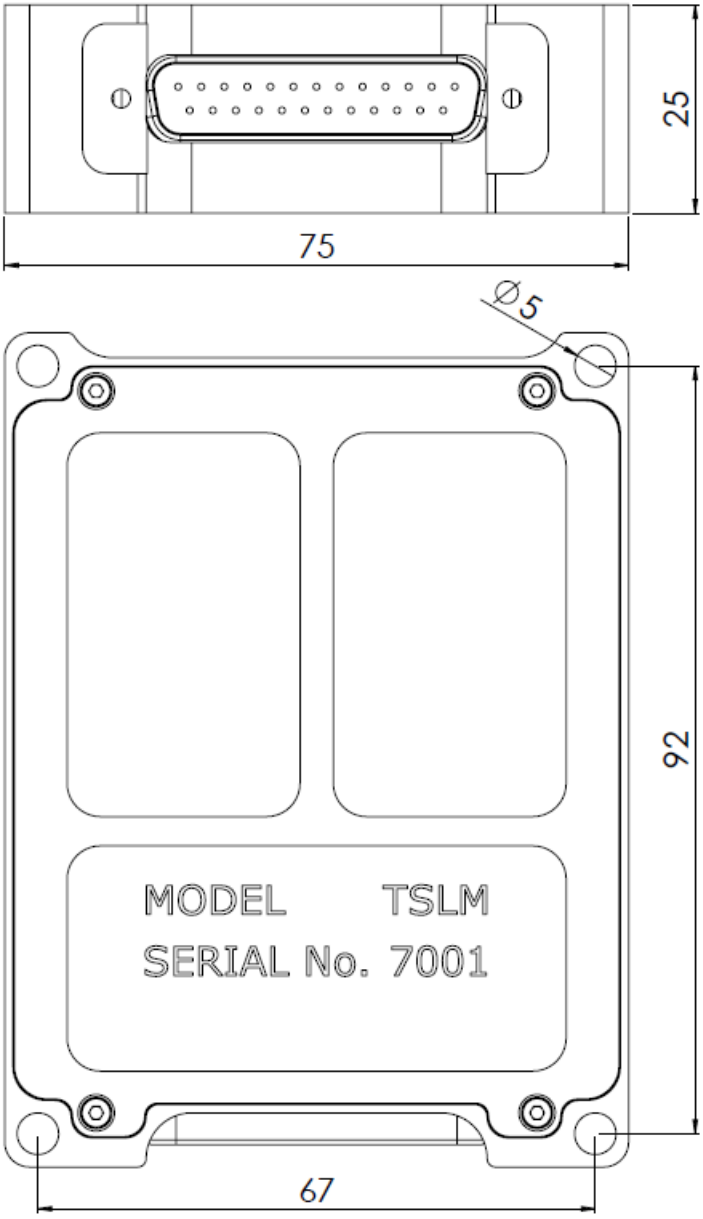
Unit Outline



1. The TSLM uses a 25-pin DSUB (M24308 series) male connector. The recommended mating receptacle (female) for it is the M24308/2-3

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