Installation and Continued Airworthiness Manual

with respect to CS-STAN Standard change CS106b

Document History

Date	Version	Reason
27.08.2022	V1	Initial version
30.08.2022	V1.1	Corrections
24.11.2022	V1.2	CS-STAN commented
24.07.2023	V1.3	Fuses increased 1A→2A,
25.07.2023	V1.4	Correction in circuit drawing

Referenced Documents

[1] FAA AC 43.13-1B
[2] EASA Form123.pdf
[3] EASA CS-STAN_issue_4.pdf
[2] Flight Manual Supplement.pdf

1.Table of Contents

1. Scope

This change consists of the installation of the charterware 52mm Flight-Time recorder into the panel or on top using a supplied acessory.
The hardware items supplied consist of the device itself, and mounting accessories to fit it into a 52mm through hole or a 57mm slot or even cockpit on top using a special holder.

Further materials, wires, cable binders, fuses and screws are not part of the delivery package but might be needed for an installation.

2. Mechanical and electrical data sheets

mechanical data	value	unit
size	60*60*120	mm
needed throughhole	52	 mm
weight	less then 300	gr
interface	9	pins

electrical data D-SUB 9	function (all pins exept 9 are inputs)	max. input voltage	condition	typical current consumption / minimum input impedance
Pin 1	Gnd	0		
Pin 2	Internal use	do not connect		
Pin 3	Switched signal, plus or Gnd	30V		< 1mA , > 47 K Ohm
Pin 4	Reserved , V24 Receiver	do not connect		
Pin 5	Permanent supply	30V	@ STANDBY, plane out of use @ Logging when MAIN is ON @ Transmitting when MAIN was switched OFF while standing and plane is out of use. Duration typically 1 minute.	< 150 uA < 0.1A < 3A peak, 200mA mean , 2A fuse is sufficient
Pin 6	Counter (RPM)	30V		< 3 mA, > 10 K Ohm
Pin 7	Set inverted switch on logic	Open / Gnd		< 0.01mA, > 100 K Ohm
Pin 8	Analog input (temperature)	30V		< 0.1mA, > 100 K Ohm
Pin 9	Reserved , V24 Transmitter	do not connect		

3. Preconditions

First of all, the installer must investigate the status of the aircraft to be modified.
A place available for mounting must be identified first. The recorder shall be installed at the front panel but outside the primary field of view of the pilot.

Ideally an existing through hole originally approved for instrument mounting should be used (left). One can directly mount it into a european 52mm instrument slot or like shown next use the delivered adaptor ring to fit it into US 57mm slots (middle). In case of a missing slot one can choose to mount it on top with the delivered acessory (right).

4. Assured characteristics with respect to EASA CS-SC106b of CS-STAN issue4

SC106b asks for some requirements which we think need to be stated by us as the manufacturer of the Recorder. We hereby comment on the EASA citations of CS106b given in a format:

"Blue EASA CS106b text in citation marks"
CHARTERWARE: Followed by our prefix: and comment in normal text format.

"This SC is for the installation of flight-time recorders without affecting any aircraft systems or installing any new data acquisition points."
CHARTERWARE: The optional wiring to an RPM Signal and Temperature signal may not be connected when installling under CS-STAN conditions.

"The installation of additional batteries is not covered by this SC."
CHARTERWARE: There are no batteries included in the device nor necessary.

This SC does not cover the installation of external antennas (see CS-SC004), which may be applied concurrently.
CHARTERWARE: The device runs fully on own internal antennas. No extra antennas are needed.

"Data bus/data connectivity between the flight-time recorder and any other equipment that is ETSO authorised or approved in accordance with point 21.A.305 is not allowed."

CHARTERWARE: The optional wiring to an RPM Signal and Temperature signal may not be connected when installling under CS-STAN conditions.

"The equipment is suitable for the environmental conditions to be expected during normal
operations; see CS STAN.42 in Subpart A for guidance.
CHARTERWARE: We confirm, that the device is suitable for normal operations and environments found within manned aircrafts.

“Perform an EMI test to assess any interference of the flight-time recorder with other systems, provided that the flight-time recorder emits transmissions during flight. “

CHARTERWARE: We do not transmitt during flight at all.
Furtermore we have carried out a device verification according to DO-160G to meet relevant EMI standards with respect to unwanted spurious emissions. Please check our Website for a download of the test report but also do a final interference verification.

“Limitations

Any limitations defined by the manufacturer of the flight-time recorder apply.”

CHARTERWARE: There are no limitations, see Flight manual Supplement

“GSM, UMTS, LTE, or similar transmission functions whose output power is unknown or is greater than 100 mW shall be switched off during flight.”

CHARTERWARE: We hereby confirm that all RF transmitters are shut off, even dispowered during flight by an automatic flight mode. As a prerequisite for enabling the GSM / LTE / RFID tranceivers, the contolling main or avionik swich must be off and the plane is not moving but assured by a GNSS speed measurement that it is standing.

“The embodiment of this SC must not affect any other aircraft systems or involve the installation of any new data acquisition points.”

CHARTERWARE: If Rpm and Temperature inputs are not connected this is assured.

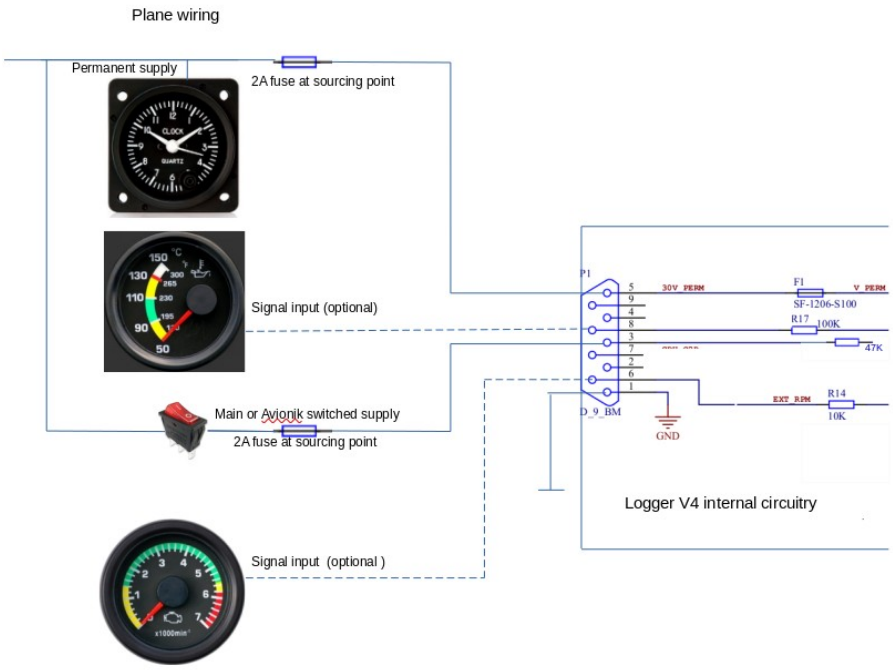
5. Principal installation wiring

5.1 Standard supply nets like Cessna , Piper etc.

In a basic electrical installation pin1 is connected to Gnd, pin5 is connected to a permanent supply (i.e. in parallel with the clock) and pin 3 is connected to a switched supply like main or avionic supply. The device comes with an own 2A internal fuse at its permanent supply line pin 5 and a current limiting resistors of 47K Ohm at it's switched signal line pin 3 like shown in the graph. However to protect long installed supply wires one might install in line fuses at the sourcing points of your supply lines for pin 3 and 5. A fuse of 2A with slow characteristic is sufficient. If a permanently supplied clock device and an avionik switched device for the switched signal is in the neibourhood this might not be necessary because it should already be installed for the clock.

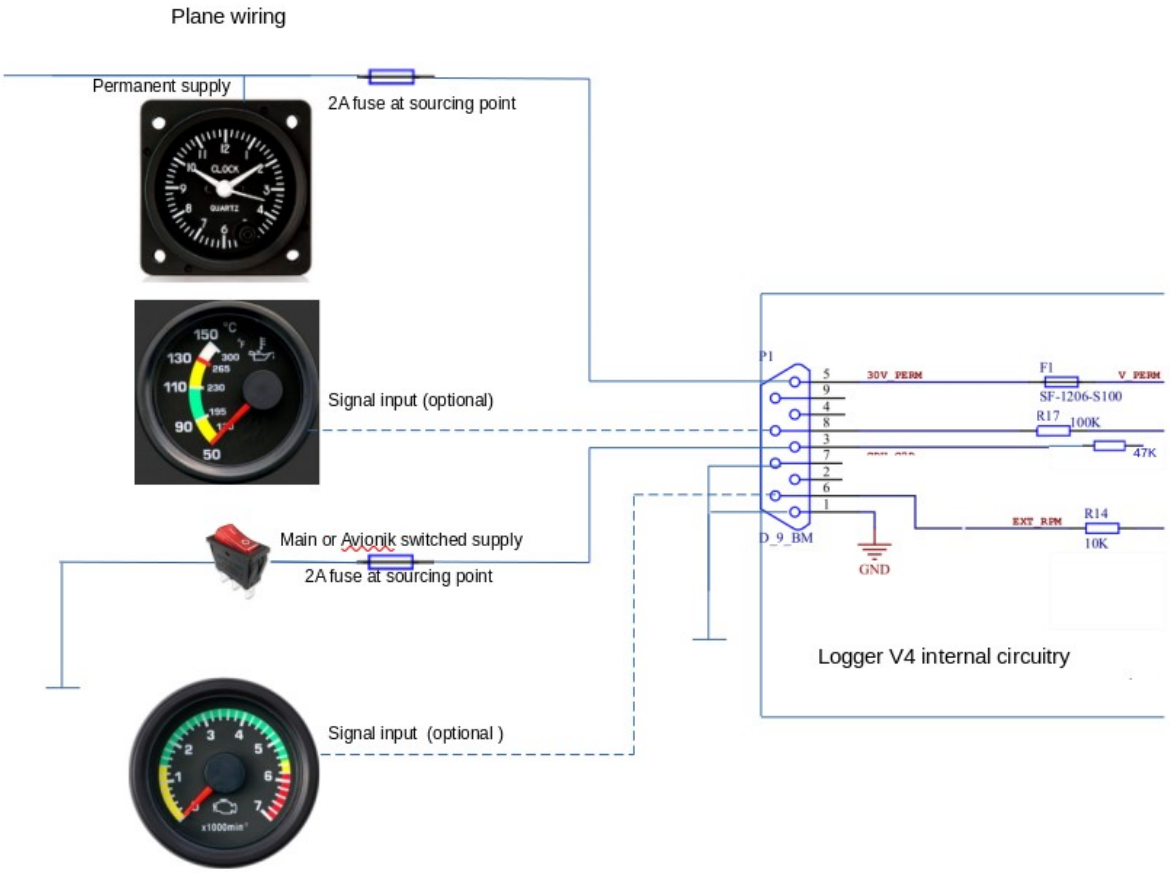
The logger contains own internal sensors for accelerations, turn rates and positions. To use them it is sufficient to provide the 3 supply lines at pins 1,3 and 5.

If one installs outside of CS-STAN and would like to log also RPM or measure the signal usually supplied to a temperature instrument, then such signals can optionally be connected to the logger. Both will only be coupled by high impedance inputs if connected.



5.2 Some inverted switched supply busses

Some planes like Socata and Robin keep their avionic devices permanently connected to positive supply while they are breaking the connection to ground to switch them off. The logger supports such inverted switching logic if you connect pin 7 to Gnd rather than keeping it unconnected. After doing so, the main switched input pin 3 will be activated by a ground signal at pin 3 rather than plus. All the other descriptions of the above paragraph apply unchanged.



- - - END - - -