

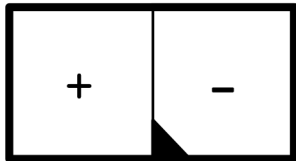
Document Version	V1.2 (August 2026)	
Design	Harkwood Services Ltd.	
Title	Installation of USB-PD chargers.	
Classification	Minor	
Aircraft Type	This design change is designed for: • Aeroplanes that are not complex motor-powered aircraft. • Rotorcraft that are not complex motor-powered aircraft. • Any ELA2 aircraft.	
Document Affected	Weight and Balance	No, negligible
	Electrical Load Analysis	Yes
	Compass Swing	No
	Maintenance Manual	No
	Wiring Diagram	Yes
	Flight Manual	Yes
	Logbook	Yes
	Radio Licence	No
Reason for Change	Installation of a safe and low RF signature USB supply for charging portable electronic devices and any device requiring a USB-C PD supply	
Description of Change	Installation of USB supply.	
Scope of the change	The change consists of a mechanical and electrical installation. The installation will re-use existing wiring provisions wherever possible. A new circuit breaker will be installed, as well as an ON/OFF switch when necessary. This design change does not include structural changes. The charger provides supplementary DC power for electronic devices. It is not part of, and must not be relied upon as part of, the aircraft's essential electrical system. • Do not use this unit to power flight-critical equipment or essential avionics. • Installation must be carried out strictly in accordance with the applicable approval framework according to applicable regulations. • Operate the unit only within the limits given in the Technical Specifications section of this manual.	
Environment	The equipment has been designed to be installed in the cabin of a general aviation aircraft, where it is protected from direct sustained fluid ingress.	

Aircraft power supplies	Equipment may be connected to 14 VDC or 28 VDC.
Circuit protection	A dedicated circuit protection device shall be used. This can either be a pullable style circuit breaker or a switch-type circuit breaker. The circuit protection device is to be identified according to the system being protected.
Electrical Load Analysis	The Electrical Load Analysis (ELA) should be updated. For aircraft that don't have an ELA, a complete analysis shall be made. If there is insufficient power available to support the default charger power output, the maximum power output of the charger can be reduced to limit the load on the electrical system. Installation is only allowed when the electrical system load analysis shows that the aircraft electrical system has sufficient energy for the configured maximum output power of the charger. The charger power output can be adjusted with the Charger Manager application downloadable from the website. Upgrades of the electrical power system are not part of this modification and would require further approval.
Cooling requirements	The unit will become warm when in use. No special thermal mounting considerations are required; however, mounting to a metal surface can help dissipate any heat generated. When running for extended periods at full power, the unit should be mounted to a metal surface or structure to assist with heat dissipation. If no suitable mounting is available, a location with good air movement is recommended.
Weight and balance requirements	Not applicable. The change in weight is negligible.
Placards	Circuit breakers and switches shall be identified.
Applicability	This design change is designed for: • Aeroplanes that are not complex motor-powered aircraft. • Rotorcraft that are not complex motor-powered aircraft. • and any ELA2 aircraft.
Installers	This design change is to be installed by appropriately rated personnel depending on the regulatory route of the installation.
Continued Airworthiness:	There are no mandatory continued airworthiness instructions applicable to this installation. It is recommended to: • Inspect the wiring, using the same interval as recommended by the aircraft manufacturer. • Annually, inspect fasteners used for mounting to verify the unit is secure.

Installation / Post-installation Instructions

Installation Steps

Complete	Action
	There are no mandatory continued airworthiness instructions applicable.
	Perform an ELA update to ensure the electrical system is sufficiently rated to support the default charger power output. If there is insufficient available power, the maximum power output of the charger shall be reduced to limit the load on the electrical system. Configure the charger for a lower maximum power output as required to meet the available power from the ELA or regulatory power limit, whichever is lower. The following formula should be used, where power is in Watts: $\text{Available Power} \geq \text{Total Charger Power Set} * 1.10$ For example, a 14V aircraft has 9 amps available, which equates to 126 Watts. The charger is set to the default of 45 watts per port. $\begin{aligned} \text{Available Power} &= 14 * 9 = 126 \\ (45 + 45) * 1.10 &= 99 \end{aligned}$ As the available power is higher than the charger power setting, no derating of the charger is required.
	Determine if a switch or circuit breaker switch is required.
	Locate a suitable mounting location. Keep at least 15 cm as a compass's safe distance. Make sure the mounting location doesn't interfere with the aircraft's primary structure. The mounting location should be sure that ingress of fluid is prevented and minimise the possibility that (conductive) objects could be inserted into the USB sockets. The unit may be mounted in any orientation should the status lights be required at the bottom, top, or to the left or right of the USB-C sockets.
	If directly mounting, the unit has 4 x M3 threaded screw holes. The minimum requirement is to use two mounting points, diagonally opposite. The length of the bolt must be such that 4 to 5 mm of thread is in the charger. A typical formula would be panel thickness + 4 mm. When using an adapter plate, use the provided fixings to mount the plate to the charger. A Torx T10 driver is required. A medium-strength locking compound should be used, such as Loctite 243.
	Make the aircraft safe for maintenance according to standard practices.

	Observe health and safety instructions where applicable.
	Carry out any modifications needed to the instrument panel, avionics rack or pedestal to facilitate installation. Use FAA AC-43.13-1B and the aircraft maintenance manual for standard practices.
	Install new wiring. Use either the supplied power cable or self-supplied MIL-W-22759/16-20 or equivalent 20 AWG wiring. The cable length from breaker to charger should not be longer than 2m. Connect the positive wire to an unused or new, suitably rated circuit breaker based on the aircraft electrical system voltage. This circuit breaker shall be connected to an avionics bus. When multiple buses are available, connect to a non-essential bus. An on-off switch can be installed in series between the circuit breaker and the device if needed. As an alternative, a circuit breaker / switch can be used. Recommended circuit breakers: Klixon 7277-1-5 / 7277-1-10 Klixon 7277-2-5 / 7277-2-5 Tyco W23X1A1G5 / W23X1A1G10 Recommended circuit breaker / switch: Tyco W31X2M1G5 / W31X2M1G10 Install the wiring using standard practices as described in the aircraft maintenance manual, or FAA AC-43.13B. When self-supplied wiring is used, the following connector is required: Molex bare connector P/N 43645-0200 (QTY 1) Molex crimp pin P/N 43030-0002 (QTY 2) These pins should be crimped with Molex crimp tool P/N 63819-0000. Pins should be inserted, per the illustration below when looking into the rear of the charger. 
	Test wiring for continuity and isolation.
	Apply USB charger or PSS PED decal near the circuit breaker and near the switch, if applicable.

Post-Installation

Complete	Action
	Power up the aircraft and switch on the charger. Check that the self-test is being performed, on which the port lights will pulse in sequence. The status lights should indicate idle on all ports with nothing connected when the self-test is complete.
	Connect a device to be charged. Ensure the green LED at that port lights up and the device reports a power connection. Check all ports for proper operation.
	If required, adjust the brightness or disable the status LEDs with the charger manager application.
	While charging a device, perform a full aircraft EMI test in accordance with FAA AC 43.13-1B, Chapter 11, as required.
	If required, fill out EASA Form 123 for this modification. Include the ELA results and document if the charger overpower was adjusted.