

BRP-Rotax

INSTALLATION MANUAL

EMS

Components	• ECU (Control unit assy.) • ECU actuators • ECU sensors • EMS current supply • Fuse box • Switches • Wiring
ECU	The core of the EMS is the engine control unit (ECU), which consists of two modules. These modules will be denoted by LANE A and LANE B, each one capable of taking over control, regulation and monitoring of the engine. In error-free engine operation, both LANES are turned ON. During engine control by LANE A, LANE B ensures that the engine operation can be maintained even after a failure or reduced functionality of LANE A. Depending on the activity and the failure status of the two LANES, the ECU automatically selects a LANE to take over control of the engine.
Sensors/ Actuators	A huge quantity of sensors (e. g. sensors for measuring the pressure in the airbox) and actuators (e. g. ignition coils) of the engine is designed with redundancy. In this case, each of the sensors or actuators is connected to a LANE, so that the two LANES have the same measurement values and send the same output signals. Non-redundant sensors (e. g. oil pressure sensors) are connected to one LANE only and serve for the expanded monitoring of the engine functionality. Due to an ECU internal communication, these sensor values will be exchanged between the two LANES (assuming that both LANES are active and free of errors).
Interface	Each LANE has a maintenance and a display interface (CAN-bus). While the maintenance interface is required to work with the software B.U.D.S. Aircraft to perform various diagnostic and maintenance activities, the display CAN interface enables the connection of a display for visualization of engine parameters.
Fuse box	In addition to the ECU, the Fuse box is another major component of the EMS. The Fuse box with its two rectifier regulators (from generator A and generator B) is responsible for a constant power supply to all EMS components including fuel pump module and the aircraft.
Provide	After engine start and before the engine has reached a defined speed for a specified time (see latest Operators Manual), the EMS is powered by generator B. After this threshold is activated, the generator B can be used to supply the aircraft and to recharge the aircraft battery. In this system state generator A supplies the EMS. In case of an error in the area of the power supply, the EMS is re-switching to generator B for continuation of the engine operation. In this case, the aircraft is no longer supplied with electrical power and the battery will not be recharged. This system state can only be reset with a full restart (power cycle) of the ECU.