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# Operation Manual

## TAE-CED-125

**Doc. No.: OM-CED-01**

**Version: 3/1**

### **Attention:**

**The Operation Manual has to be read thoroughly before bringing the display into service because it contains safety-relevant information.**

### **Note:**

**The Operation Manual has to be handed over to the new owner in case of selling the display / engine / aircraft.**



TAE-CED-125  
Operation Manual

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### 0.1 Index of changes

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1-7	3/1	01.10.04	J.Gutzmann



## 0.2 List of effective pages

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Erstellt: B.Metzdorf	geprüft: C. Christensen, MPI	freigegeben: J.Gutzmann, MPL
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## 1 Overview

The Compact Engine Display, TAE-CED-125, is designed to provide the pilot with information about some engine parameters.

The TAE-CED-125 can only be used with the engine control unit of the TAE-125-01 engine and succeeding engine control units from TAE.



The Display receives CAN-Bus-Messages from the ECU to be displayed. There are RPM, Load, oil pressure, oil temperature, cooling fluid temperature and gearbox temperature. Furthermore, the display is capable of warning the pilot if one of these values is out of the green range. In this case, the Master Caution Lamp is activated. The Master Caution Lamp is only activated if the caution condition is steady for at least these times in order to suppress short intermittent conditions:

- RPM > 2300: 20s
- RPM > 2400: 2s
- All other: 0s (immediate).

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- RPM > 2300: 20s
- RPM > 2400: 2s
- All other: 1s.

The RPM display is treated specially: If the actual RPM is only over 2300 for a short time the display will still show just "2300". Only if RPM>2300 for more than 20sec or >2400 for more than 2sec then the RPM display changes to show the actual RPM value again instead of "2300".

By pressing the Test Switch the Master Caution Lamp can be cleared if e.g. one engine parameter was only a short time out of range. By pressing the Test Switch for at least one full second the LED-Test is activated: All LED's are switched on and defective LED's can be identified.

A Potentiometer to dim the display can also be connected. If the potentiometer is turned to the stop, which corresponds to minimum luminance, the auto-dim function is activated and a Light Dependant Resistor (LDR) controls the luminance of the display. The Master Caution Lamp, the Test Switch and the Potentiometer are external to the display.

## 2 Rated performance

The display is, depending on the viewing angle, readable up to an ambient illumination level of:

Viewing angle [°]	Illumination [lux]
40	26000
45	15000
55	10000

The following engine parameter are displayed:

RPM:	0	1000	1250	1500	1750	1900	2000	2100	2200	2300	(rpm)	
POil:	0	0,6	1,2	2,3	2,8	3,6	4,4	5,2	6,5	6,8	(bar)	
TH2O:	-99	-50	-32	60	82	87	92	96	105	115	(°C)	green
TOil:	-99	-50	-32	50	80	95	110	130	140	155	(°C)	amber
TGear:	-99	35	50	65	80	95	110	115	120	155	(°C)	red
Load:	0	11	22	33	44	55	66	77	88	99	(%)	

Each coloured field in the table corresponds to one LED. Only one LED is active for each engine parameter. The LED is activated if the transmitted value from the FADEC is equal or bigger than the value in the table.

RPM and LOAD have also a 4 and 3 digit 7-segment display.

## 3 Operating limits

The display TAE-CED-125 complies with JAR-21 Subpart O and JTSO-C113.

Altitude: ..... 25000ft  
 Operating temperature range: ..... -45°C .. 70°C  
 Ground survival temperature: ..... -55°C .. 85°C  
 Supply voltage: ..... 7..16VDC  
 Duty cycle: ..... 100% / continuous operation

## 4 Instructions

### 4.1 Power-Up test

When the display is powered up, the power-up test sequence is automatically started: The Display switches on all LED's (all segments in all bar graphs and all segments in the 7-segment displays) as well as the master caution lamp for two seconds before starting standard operation. The pilot should confirm that the display is working and no segments fail to light up by monitoring this test.

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## 4.2 Master Caution Lamp

The master caution lamp is switched on by the CED whenever any of the displayed parameters leaves the “green”/normal operating range and enters the “yellow”/warning range with one exception: The master caution lamp functions exactly this way in regard of the oil pressure value if the RPM reading is larger than 1500rpm. If the rpm reading is less than 1500 rpm (idle), the oil pressure must drop into the red range to cause the master caution lamp to light up.

The master caution lamp stays switched on, even when the parameter returns to the “green”/normal operating range and must be confirmed by pressing the Confirm/Test switch.

## 4.3 Confirm/Test switch operation

The confirm/test switch incorporates two functions, depending on whether it is pressed shortly or longer than one second.

If the master caution lamp is switched on, pressing the Confirm/Test switch confirms that the pilot has noticed the warning and will switch off the master caution lamp, even if one or more parameters are still in the “yellow”/warning range. After being confirmed, the master caution lamp will still be switched on again whenever another parameter enters it’s warning range or if the confirmed parameter leaves it’s warning range and then enters it again.

Pressing the Confirm/Test switch longer than one second will initiate the power-up test sequence. This feature can be used to check the instrument is really working and all LED and light elements do work as well.

## 4.4 Dimmer operation

The dimmer potentiometer can be used to dim or brighten the display: Turning the knob to the right means brighter and turning the knob to the left means dimmer.

If the knob is turned all the way to the left, the automatic dimming feature is switched on – a light sensor in the instrument will dim the instrument lights automatically according to environmental lighting conditions.

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## 5 Maintenance

### 5.1 Software update

The instrument can be updated to the latest version of the software (both Firmware and Mapping) in the field. The software update is performed without mechanical intervention with the aid of the TAE-supplied software tool "ECU Operator" and a corresponding software license which permits programming of the FADEC. Personnel must attend a special TAE software update training course to learn how to handle the software tool and how to use the expanded functions to program the instrument.

CED software update procedure:

1. TAE supplies the software update in electronic form with an enclosed description sheet and one label each for the supplied version of the Firmware and Mapping. The description sheet contains the procedure for checking the CRC (Cyclic redundancy check) of the software, which is to be performed later.
2. Open the ECU Operator and establish connection with the CAN.
3. Switch on power to the instruments. Do not start the engine.
4. Program the Firmware:
  - a. In the ECU Operator select "Program Firmware".
  - b. Select the Firmware file specified in the description sheet.
  - c. Wait until the new Firmware and the programming are transferred.
  - d. Wait until the CED self-test cycle is completed.
  - e. DO NOT SWITCH OFF POWER UNTIL SELF-TEST CYCLE IS COMPLETED.
5. Program the Mapping:
  - a. In the ECU Operator select "Program Table", then select ECU B.
  - b. Select the Mapping file specified in the description sheet.
  - c. Wait until the new Mapping and the programming are transferred.
6. Switch off the power supply to the Instrument and wait 10 seconds.
7. Switch on the power supply to the Instrument.
8. In the ECU Operator open the screen "CED-125 CRC".
9. Compare the displayed CRC numbers with the CRC numbers on the description sheet. If all numbers match, then the software update has been successful. If for any reason the update is incomplete or it has not been performed at all, it is permissible to repeat it up to two times. If the CRC numbers still do not match after a second repeated attempt the CED is faulty, must immediately be removed and sent to TAE for repair.
10. Switch off the power supply.
11. Disconnect the CAN connection.
12. Connect the CAN terminator back onto the CAN connector of the aircraft.  
Stick the labels with the current version of the Firmware and Mapping in the aircraft log book.

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