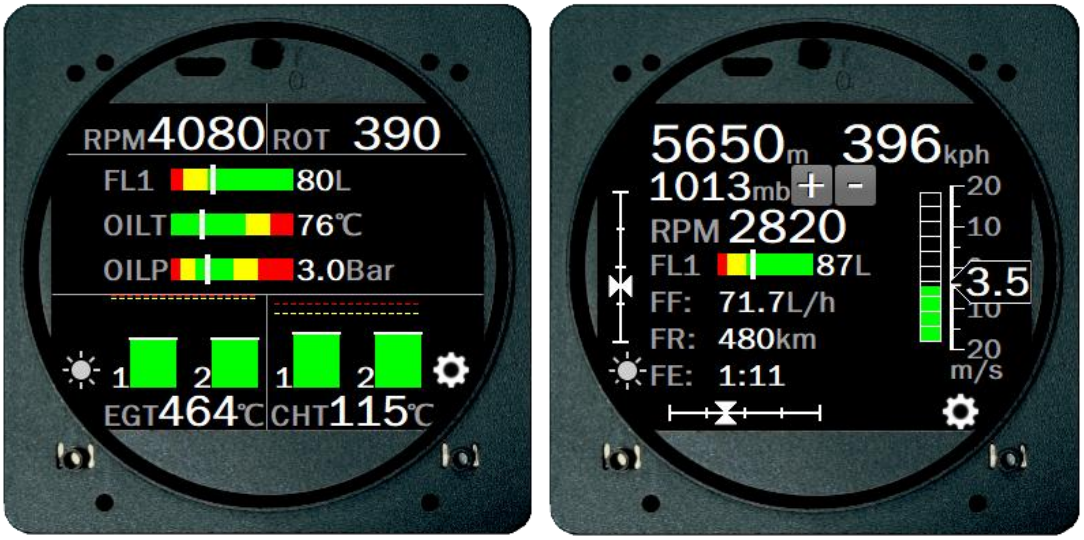
CF1000 EI/FI
User Guide



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Copyright

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Registering Your CF1000EI/FI

Please send an email to sz_cfi@163.com to register your CF1000EI/FI. Registering your product with CFI ensures that your contact information is up-to-date. This helps verify product ownership, can expedite warranty claims, and allows us to notify you in the event a service bulletin is published for your product. You can also optionally sign up to receive other CFI news and product announcements. CFI will not share your contact information with third parties or send you announcements without your explicit consent.

Please provide the following information when registering:

- Product model;
- Product serial number;
- Purchase date;
- Purchase location or store or distributor;
- Do you accept our service announcement for the CF1000EI/FI;
- Do you accept our CFI news and announcement for other products.

Limited Warranty

CFI warrants this product to be free from defects in materials or workmanship for one (1) year from date of shipment. CFI will, at its sole option, repair or replace any components that fail in normal use. Such repairs or replacement will be made at no charge to the customer for parts or labor. The customer is, however, responsible for any transportation cost. This warranty does not cover failures due to abuse, misuse, accident, improper installation or unauthorized alteration or repairs.
THE WARRANTIES AND REMEDIES CONTAINED HEREIN ARE EXCLUSIVE, AND IN LIEU OF ALL OTHER WARRANTIES

EXPRESSED OR IMPLIED, INCLUDING ANY LIABILITY ARISING UNDER WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, STATUTORY OR OTHERWISE.

IN NO EVENT SHALL CFI BE LIABLE FOR ANY INCIDENTAL, SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES, WHETHER RESULTING FROM THE USE, MISUSE OR INABILITY TO USE THIS PRODUCT OR FROM DEFECTS IN THE PRODUCT.

CFI retains the exclusive right to repair or replace the instrument or firmware or offer a full refund of the purchase price at its sole discretion. SUCH REMEDY SHALL BE YOUR SOLE AND EXCLUSIVE REMEDY FOR ANY BREACH OF WARRANTY.

CFI' products incorporate a variety of precise, calibrated electronics. Except for external accessories, this device does not contain any field/user-serviceable parts.

Units that have been found to have been taken apart may not be eligible for repair under warranty.

Revision History

Revision category	Revision Date	Description

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1. Safety information

Lithium battery related safety incidents are much more likely to occur during the charging process or transportation. With this consideration, we do not supply the AH3A with batteries. Batteries, if needed, can be purchased by users from professional battery suppliers. It is recommended to use power banks with capacity greater than 1000 mAh – preferably those with clear indication of the remaining capacity. A full capacity of 1000 mAh can keep the AH3A working for at least one hour. The USB port on the back of the AH3A can be used to connect to a 5V DC power bank. We enclose a cable with dual USB male plugs for connection. There is also an optional bag for holding the spare battery. The power bank and its bag should be placed in a safe place on the aircraft - such as the side of the cockpit , i.e., anywhere the batteries can be easily found and taken off the aircraft but will not fall off or be thrown out involuntarily. The purpose of taking out the battery is to charge it on the ground with mains electricity, like many power banks used in mobile devices such as mobile phones.

The normal usage of the CF1000EI/FI only needs the power supply on aircraft, 10 ~ 30 VDC voltage. It is only when the power supply on aircraft fails, the CF1000EI/FI will switch to source power from the standby battery/power bank.

In 2023, we launched the CFX000-BP backup powe. Backup powe built-in charging, battery protection and power boost circuits, which can provide backup power supply for the integrated display and instruments. When the on-board power supply is normal, it can provide stable 12V voltage for the instrument, and when the on-board power supply fails, it can ensure the normal operation of the instrument. For example, a integrated display(working current $\leqslant$ 1.2A) and a set of flight instruments can be guaranteed to work normally for more than 30minutes when the Backup power is fully charged.

2. Product Profile & Installation

The CF1000-EI engine instrument (universal engine monitor for a compact) and the CF1000-FI flight instrument (micro integrated flight parameter display) has a 3.5” screen. The CF1000-FI is a compact, multifunction complete primary flight system intended as a main flight instrument on smaller aircraft or as a backup / secondary flight instrument in larger aircraft. The CF1000-EI contains all the necessary functionality to replace several engine monitoring instruments. CF1000-FI and CF1000-EI are ideal companions for each other. These 3 1/8” (80mm) instrumens provide a compact, low cost yet highly functional and complete cockpit solution.

As the product has not obtained the airworthiness certification of CAAC, FAA, EASA or other regulatory agencies, All critical flight information is presented for reference only and must be verified by the use. It can not be used to replace any required flight instruments in type certification aircraft unless the AH3A is certified together with the aircraft or supplementary certification for this purpose.

The CF1000-FI can display the following parameters:

- ALTITUDE
- AIRSPEED
- VERTICAL SPEED
- ENGINE TACH
- ROTOR TACH or FUEL FLOW
- CURRENT or TEMP collected from PT100
- 5 Universal channels, optional FUEL LEVEL, TEMP, PRESS or Custom Parameters
- 1 channel Alarm Light Output

The CF1000-FI can display the following parameters:

- Engine TACH
- Rotor TACH or FUEL FLOW
- CURRENT or TEMP collected from PT100
- 5 Universal channels, optional FUEL LEVEL, TEMP, PRESS or Custom Parameters

- 4 Thermocouple channels, optional EGT/CHT, J/K thermocouple
- MAP
- 1 channel Alarm Light Output
- 1 channel CAN Inputs, can be connected to the ECU of Rotax 91Xis and UL Power engines

Figure 1

Main technical parameters:

- Monitor size: 86 x 86 x 34.6mm;
- Monitor weight: 0.30kg;
- Active display area: 70.08 ×52.56mm2(3.5”);
- Resolution: 320×240;
- LCD: TFT;
- Brightness: 800 cd/m2;
- Viewing angle:
  65° left & right& up, 55° down;
- Working voltage: 8~30 VDC;
- Power: ＜3W(at 12V);
- Storage: MicroSD(TF) card;
- Operating temperature: -20~+70°C;
- Storage temperature: -30~+80°C;
- Humidity: ≤ 40°C, 85%RH Max

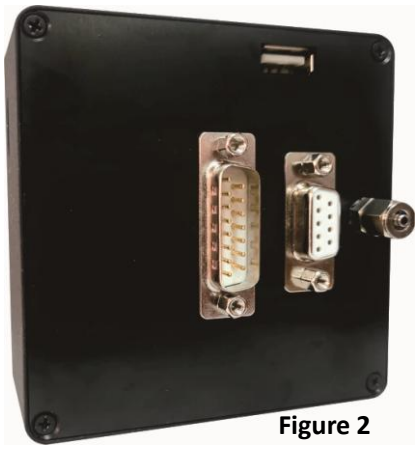


Figure 2

Figure1 and Figure2 shows the back of the CF1000-FI and CF1000-EI respectively. The USB port above them is used to connect 5V standby power supply (battery / power bank). It can also be used to transfer the flight data stored on the MicroSD(TF) card. The CF1000-FI has two barometric ports on the right side, the upper one is the pitot port(P), and the lower one is the static port(S), and DB15 is power supply & signal input/output socket. There is a manifold pressure interface(MAP) on the right side of the CF1000-EI, and DB15(J1) is a power supply & signal input/output socket , and DB9(P2) is a thermocouple signal socket.

CF1000-FI Port definition:

DB15(Pin)	Definition	Description	CF1000-FI Default
1	8~30V	Power Supply	—
2	GND		—
3	OAT/AMP+	PT100 or Shunt input	OAT(PT100)
4	OAT/AMP-		
5	RPM1	RPM1 input(912 or Universal)	RPM1
6	RPM2/FF	RPM2 or Fuel Flow input(Universal)	Fuel Flow
7	CH1	Analog 1 (Voltage or Resistance signal)	Fuel Level 1
8	CH2	Analog 2(Voltage or Resistance signal)	Fuel Press (0.5~4.5V)
9	CH3	Analog 3(Voltage or Resistance signal)	Throttle
10	CH4	Analog 4(Voltage or Resistance signal)	Trim up and down
11	CH5	Analog 5(Voltage signal)	Trim left and right
12	5V-OUT	5V Output(Sensors Supply)	—
13	—	—	—
14	—		
15	Alarm	Alarm output(OC (open-collector))	—

CF1000-FI Port definition:

J1 DB15(Pin)	Definition	Description	CF1000-EI Default		
			No ECU	ROTAX ECU	UL Power ECU
1	8~30V	Power Supply	—	—	—
2	GND		—	—	—
3	OAT/AMP+	PT100 or Shunt input	Current (collected from shunt)		
4	OAT/AMP-				
5	RPM1	RPM1 input(912 or Universal)	RPM1	Data provided by ECU	
6	RPM2/FF	RPM2 or Fuel Flow input(Universal)	RPM2	RPM2(only)	RPM2(only)
7	CH1	Analog 1 (Voltage or Resistance signal)	CHT1(NTC type)	Fuel Level 1	Fuel Level 1
8	CH2	Analog2 (Voltage or Resistance signal)	CHT2(NTC type)	Fuel Level 2	Fuel Level 2
9	CH3	Analog 3 (Voltage or Resistance signal)	Fuel Level 1	Rotor Tach，	OFF
10	CH4	Analog 4 (Voltage or Resistance signal)	Oil Temp	Fuel Press	OFF
11	CH5	Analog 5(Voltage signal)	Oil Press	OFF	OFF
12	5V-OUT	5V Output(Sensors Supply)	—	—	—
13	CAN L	CAN input/output	—	✔	✔
14	CAN H				
15	Alarm	Alarm output(OC (open-collector))	—	—	—

Note: Analog 1 to 4 do not support resistance signals with small rated currents such as PT100.

P2 DB9(Jack)	Definition	Description	CF1000-EI Default		
			No ECU	ROTAX ECU	UL Power ECU
1	TC1+	Thermocouple 1+	EGT/CHT J/K type	CHT J/K type	Not use when with an AUX BOX. Connect EGT/CHT when with no AUX BOX
2	TC1-	Thermocouple 1-			
3	TC2+	Thermocouple 2+	EGT/CHT J/K type	CHT J/K type	
4	TC2-	Thermocouple 2-			
6	TC3+	Thermocouple 3+	EGT/CHT J/K type	CHT J/K type	
7	TC3-	Thermocouple 3-			
8	TC4+	Thermocouple 4+	EGT/CHT J/K type	CHT J/K type	
9	TC4-	Thermocouple 4-			

2.1 Wiring Diagram

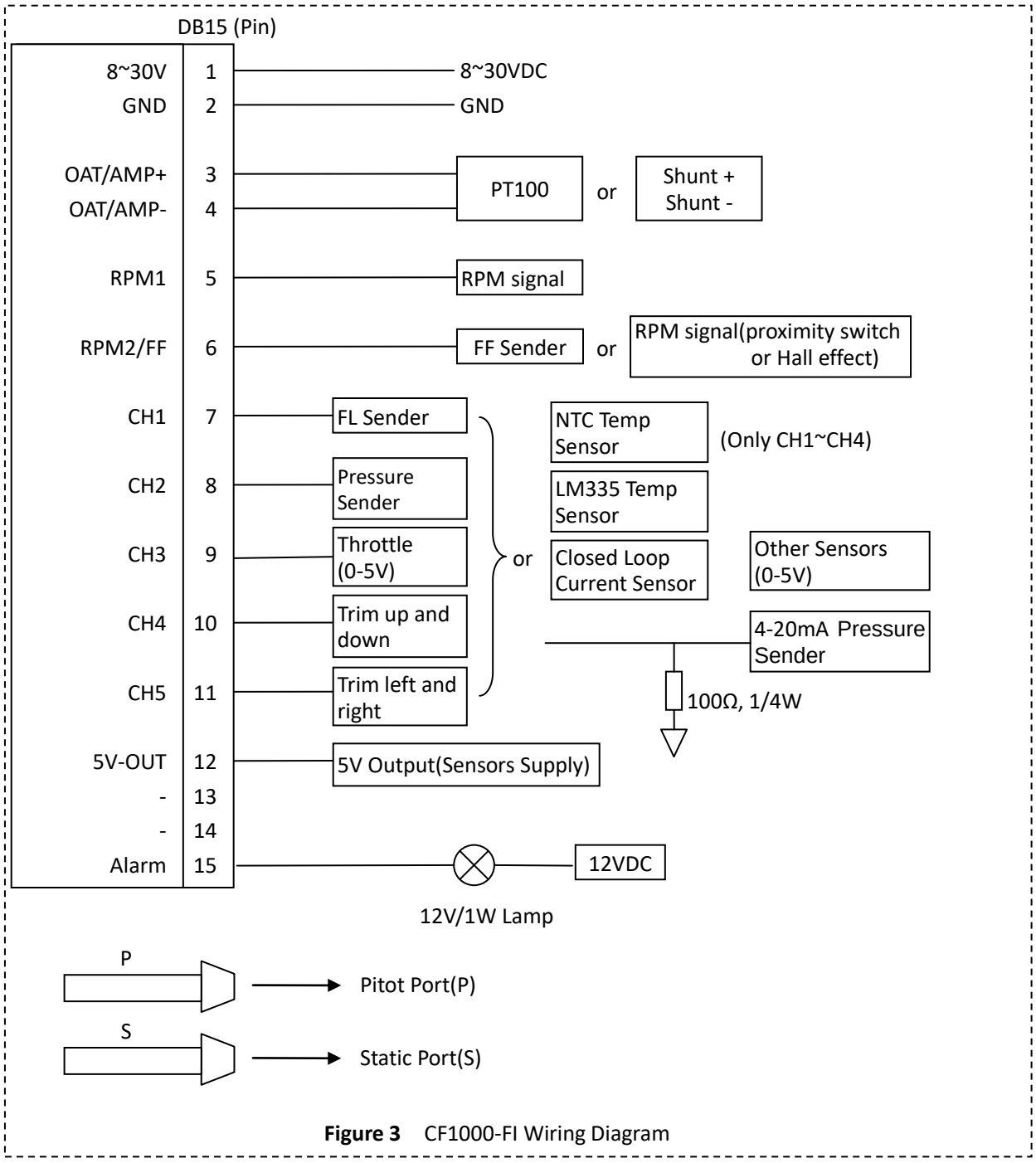


Figure 3 CF1000-FI Wiring Diagram

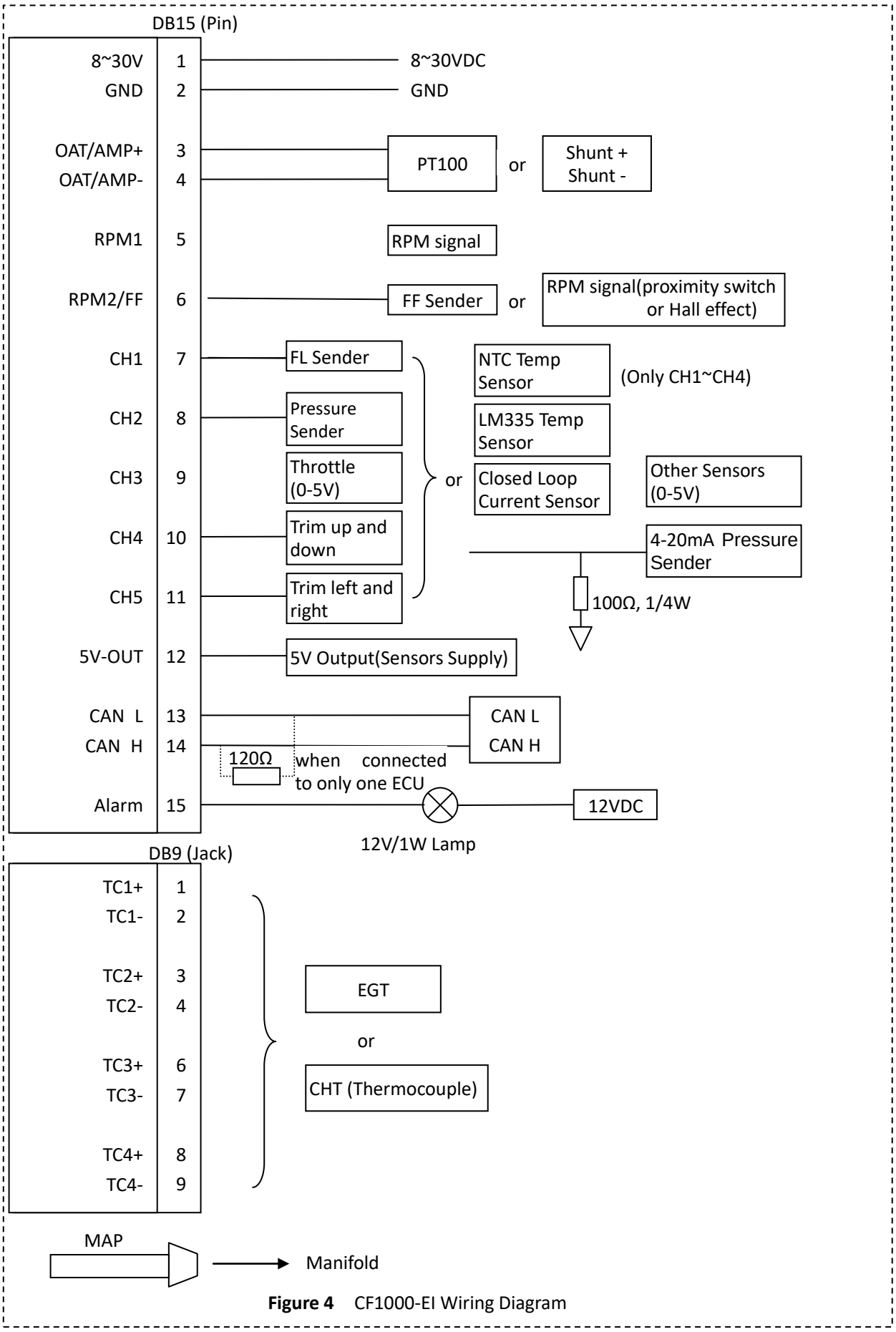


Figure 4 CF1000-EI Wiring Diagram

2.2 Port connection instructions

2.2.1 OAT/AMP

The OAT/AMP port is adapted to connect to a shunt or PT100 type temperature sensor. When connected to the shunt, its positive pole (near the power supply side) is connected to AMP**+**, and the negative pole is connected to AMP**-**; when connected to PT100, it does not distinguish between positive and negative electrodes.

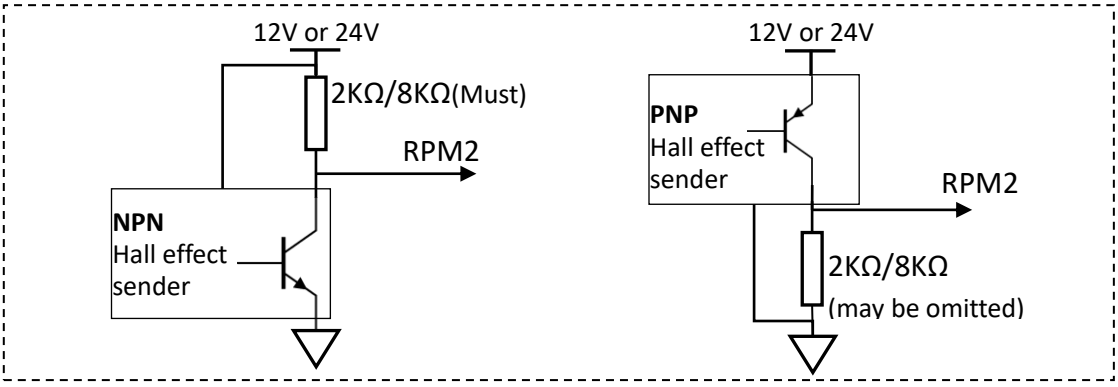
2.2.2 RPM1

The RPM1 port is adapted to be connected to the engine RPM and can withstand a pulse signal of up to 100Vpp. The RPM signal of the Rotax 91X engine can be directly connected.

2.2.3 RPM2

The RPM2 port is adapted to be connected to proximity switches or Hall effect sender and flow sender, and can accept pulses, square waves, and sine waves of 5 to 30V.

Note: Some senders have open-collector/open-drain (OC/OD) outputs and require external pull-up or pull-down resistors. The following figure shows two connection methods for Hall effect sender(or proximity switch sender). When a 12V power supply, a 2KΩ resistor is usually selected. When the power supply voltage is high, the resistance be increased appropriately. Please refer to the sender's instructions for use for specific output types.



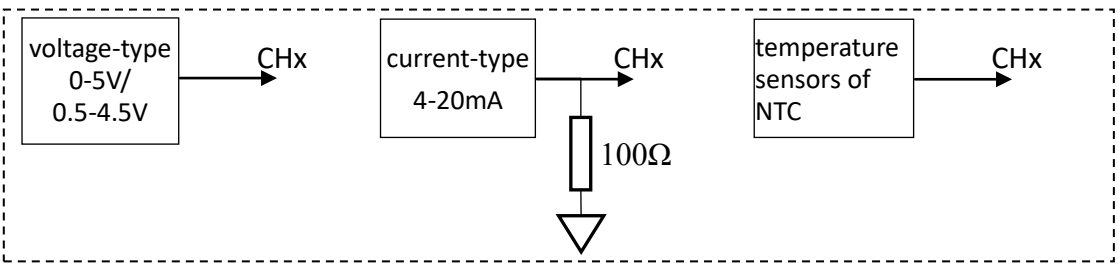
2.2.4 CH1 to CH4

CH1 to CH4 can be connected to senders for voltage-type signals (no more than 5V), senders for current-type signals of 4-20mA, and temperature sensors of NTC.

When the connected voltage signal exceeds 5V, the external voltage-dividing resistor can be increased to ensure that the port voltage is less than 5V;

When a current signal of 4-20mA is connected, an 100Ω precision resistor must be connected between the port and the ground;

When the sensor type is selected as NTC in the menu, the pull-up resistor is automatically turned on internally of the port, eliminating the need for external additions.

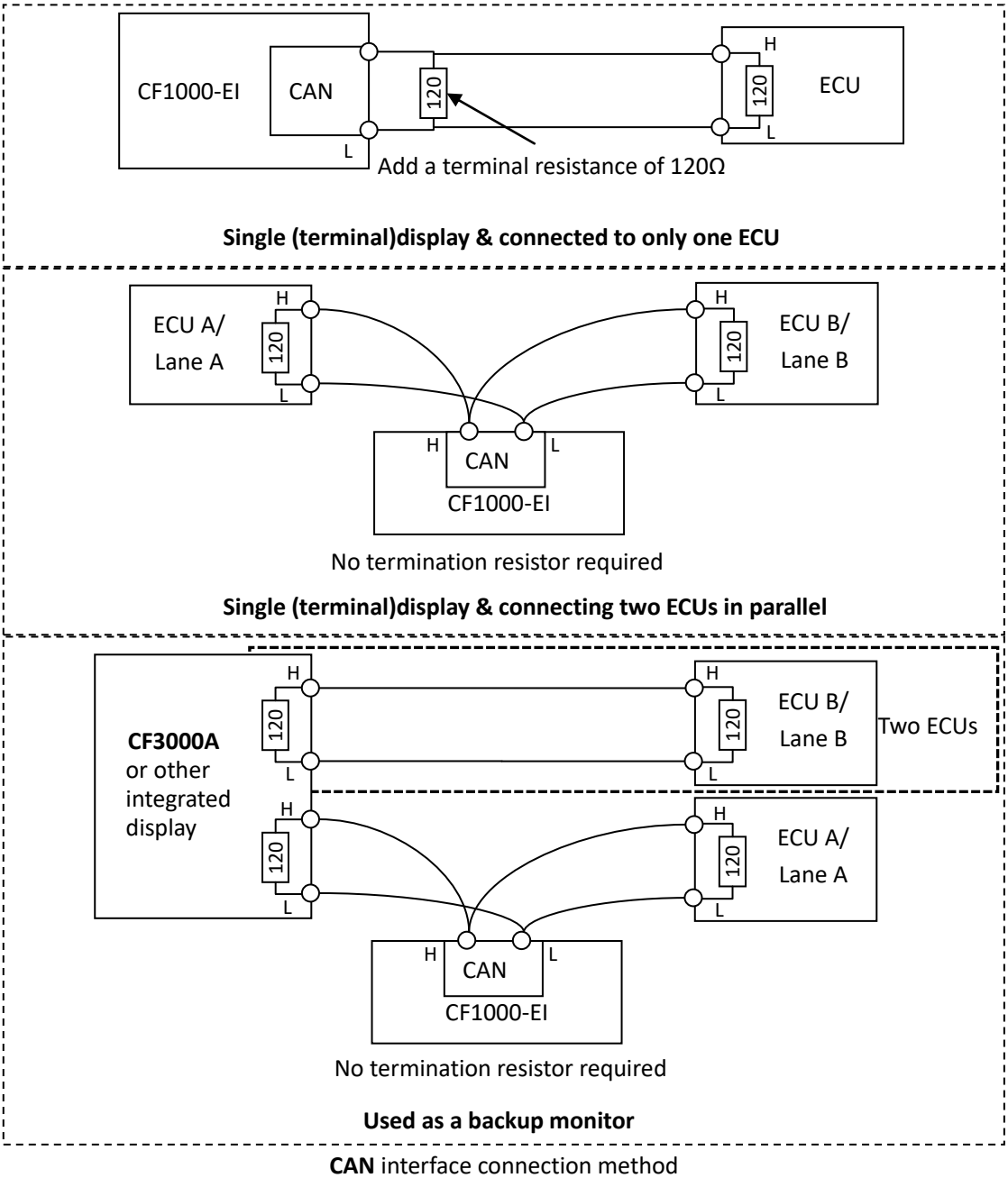


2.2.5 CH5

CH5 can be connected to senders for voltage-type signals (no more than 5V), senders for current-type signals of 4-20mA. Please refer to CH1~CH4 above.

2.2.6 CAN

The CF1000-EI is suitable for Rotax 91Xis and UL Power engines and can read ECU data of the engine. The connection method is as follows:



CAN interface connection method

When two ECUs are connected at the same time, according to the selection in the setting, when AUTO is set, ECU A/Lane A will be displayed first, and ECU B/Lane B will be displayed if A fails.

2.2.7 Alarm

The Alarm port is an open drain (OC) output with a maximum voltage of 30V and a maximum current of 250mA.

2.2.8 TC to TC4

TC1 to TC4 are suitable for J-type or K-type thermocouples. The "+" port is connected to the positive pole of the thermocouple, and the "-" port is connected to the negative pole of the thermocouple. It applies whether the probe housing is grounded or not. Cold junction compensation is provided internally in the CF1000-EI.

Note: Starting from TC1, first connect EGT in turn, and then connect CHT (thermocouple type). The middle should not be skipped. For example: When 1 EGT+2 CHT, EGT is connected to TC1, CHT is connected to TC2 and TC3.

2.2.9 P & S MAP

P is the full (dynamic) barometric input port, connected to the pitot tube.

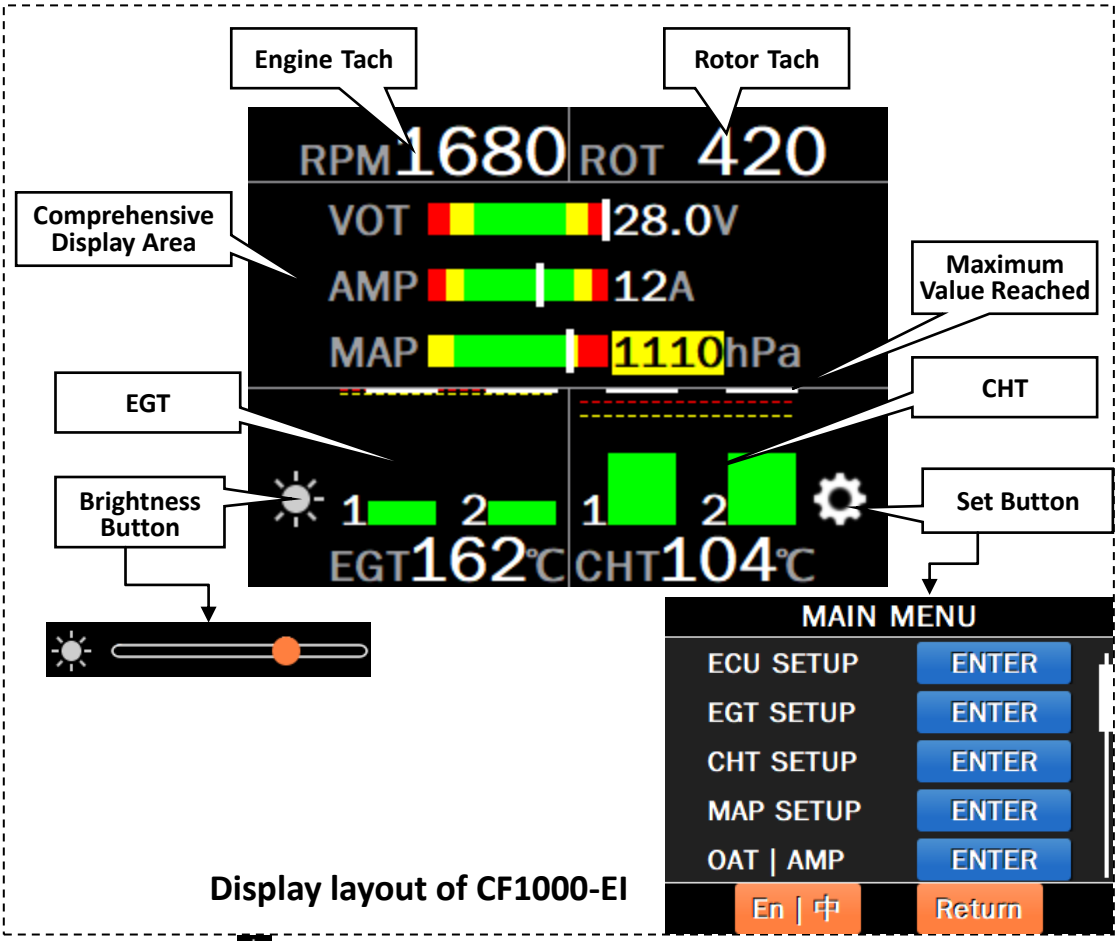
S is the static barometric input port, connected to the static barometric source or vacant. When vacant, a U-shaped tube can be connected to the end of the air pipe to prevent static barometric disturbance.

MAP is the manifold pressure input port and should be connected to the engine manifold through an air pipe. When there is no manifold pressure or display is not needed, it can be turned off in the menu.

3. Instructions for use

Put the switch on the top of the interface to **I** and wait a moment for the CF1000-EI/FI to initialize. When CF1000-EI/FI self check finds that the device is abnormal, Error▼ will pop up on the top right of the screen, click ▽ to pop up the list of abnormal devices, Error▲ ADC and click △ to fold the list.

3.1 Display layout of CF1000-EI

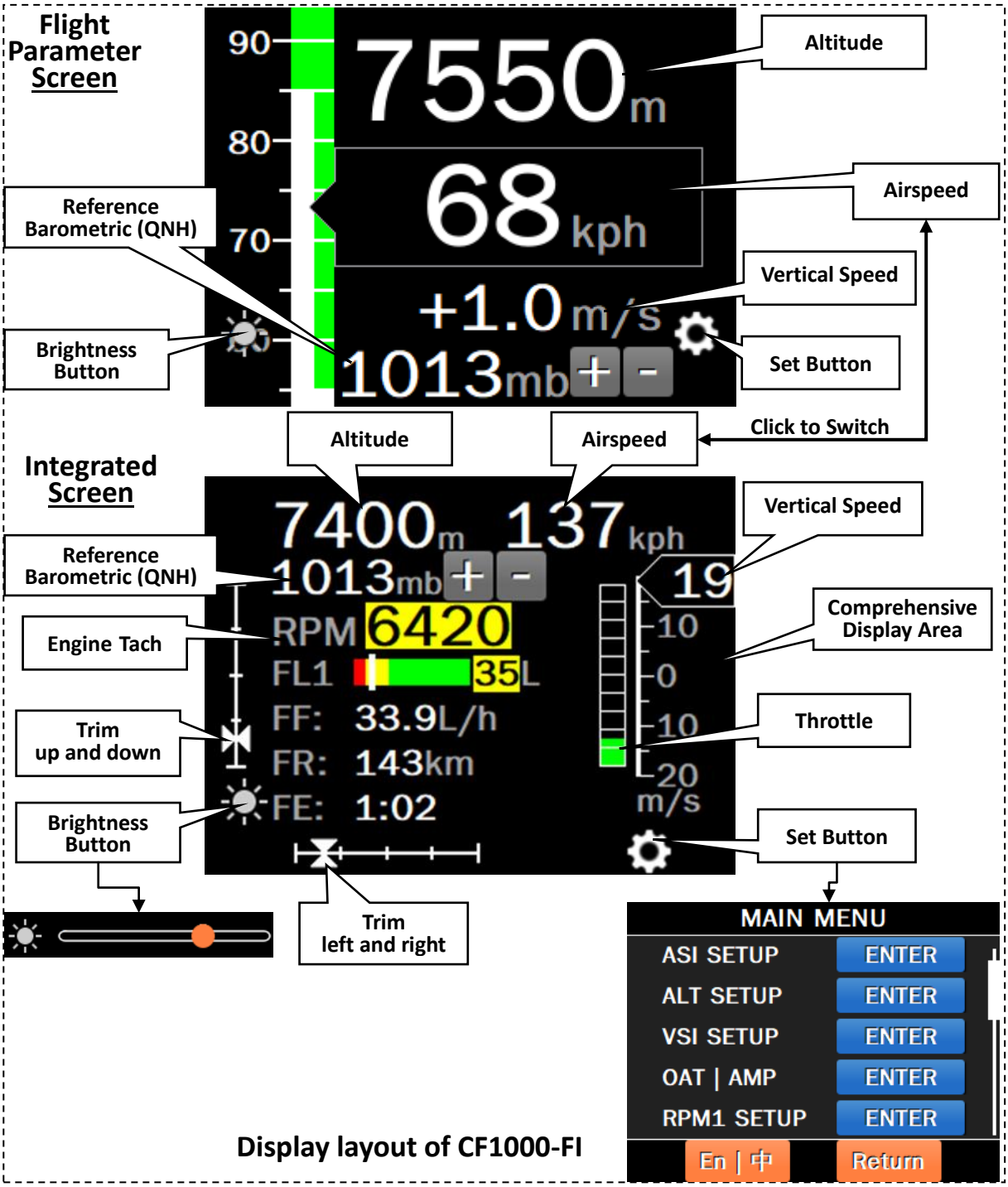


Display layout of CF1000-EI

Brightness Adjustment: Click , to pop up a slider, and slide right/left to increase/decrease the screen brightness. In the screen area (except in and button areas), swipe the screen up or down to quickly increase or

decrease the screen brightness.

3.2 Display layout of CF1000-FI

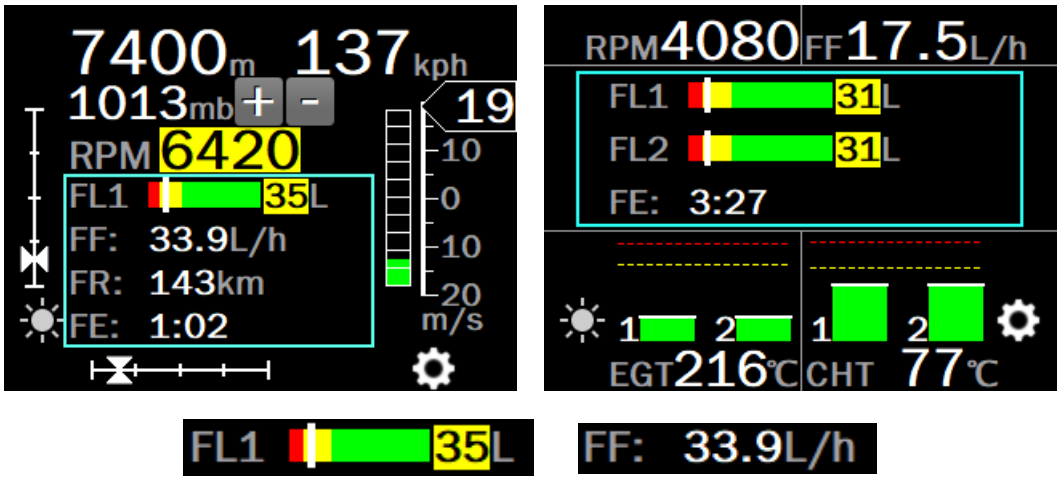


Altitude clearing: CF1000-FI will take the current barometric value sensed as the local barometric value. Press and hold "Altitude", and its display will turn blue, 5790m after 6 seconds, the setting will be completed, and the altitude will turn to 0.

Brightness Adjustment: Click , to pop up a slider, and slide right/left to increase/decrease the screen brightness. In the screen area (except in and button areas), swipe the screen up or down to quickly increase or decrease the screen brightness.

3.3 Comprehensive Display Area

The box in the figure is a comprehensive display area, with two types of display methods: bargraph format and digital. The content displayed varies depending on the settings. If the number of data displayed exceeds 1 page, the default is automatic cycle page turning display at 2 second intervals. You can manually page the page by clicking the box area. **Note:** When data in the comprehensive display area exceeds the alarm value, it will automatically switch to the automatic cycle page turning state.



Bargraph Format **Digital**

Figure 5 Comprehensive Display Area

The parameters that can be displayed in the comprehensive display area of the CF1000 FI and CF1000 EI are summarized as follows:

FL: Fuel Level, display method: Bargraph format

FF: Fuel Flow, display method: Digital

FR: Fuel Range, display method: Digital, display only when FL and FF are both valid.

FE: Fuel Endurance, display method: Digital, the format is: hh: mm, display only when FL and FF are both valid.

TIM: Current Time, display method: Digital, the format is: hh: mm: ss

FT: (this time) Flight Time, display method: Digital

TT: Total Time, display method: Digital

BAR: Barometer, display method: Digital

TAS: True Airspeed, display method: Digital

OAT: Outside Air temperature, display method: Digital

OIL T: Oil temperature, display method: Bargraph format

OIL P: Oil pressure, display method: Bargraph format

FP: Fuel pressure, display method: Bargraph format

VOT: Voltage, display method: Bargraph format

AMP: Ampere, display method: Bargraph format

MAP: Manifold Air Pressure, display method: Bargraph format

The following is the display when connecting the Rotax ECU:

MAT: Manifold Air Temperature, display method: Digital

EAT: Engine Ambient Temperature, display method: Digital

EAP: Engine Ambient Pressure, display method: Digital

The following is the display when connecting the ULPower ECU:

AT: Air temp, display method: Digital

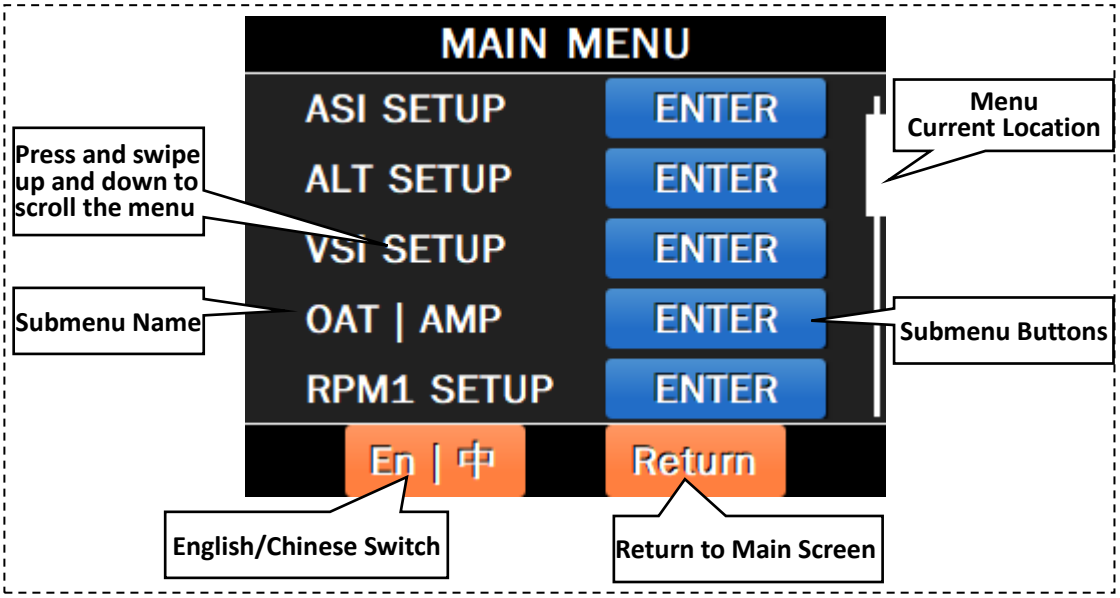
Bar: Barometric, Static pressure (naturally aspirated) or supercharged (turbocharged), display method: Digital

ECUT: Ecu temperature, display method: Digital

ECUV: ECU supply voltage, display method: Digital

Ignition status: Indication with lamp status: ①②, ①=On, ②=Off.

3.4 Settings menu



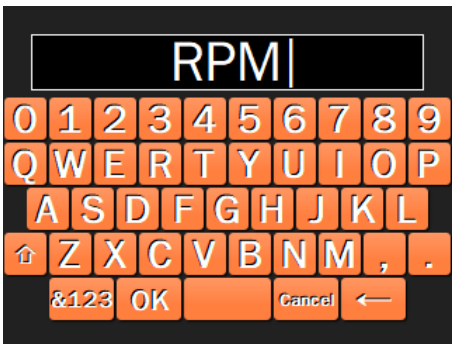
Classification and Functions of Buttons:

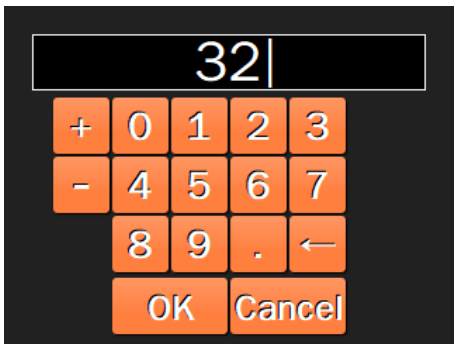
ENTER: Click to enter the corresponding submenu;

SET: Click to clear, restore default settings, etc., and a confirmation prompt will pop up before execution;

V0.81 976.56: Display read-only information such as version number and barometric value;

32 kph: Menu options allow you to modify parameters such as setting values, units, and alarm switches. Clicking the character or numerical class will pop up the corresponding soft keyboard. Clicking the unit class will switch the display unit.

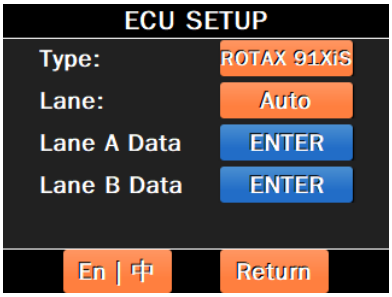




The menu is different depending on the instrument model (CF1000FI/CF1000EI) and ECU type. Refer to the following table:

MENU ITEMS	CF1000 FI	CF1000 EI	CF1000EI Rotax ECU	CF1000EI ULPower ECU
ECU SETUP		✔	✔	✔
EGT SETUP		✔	✔	✔
CHT SETUP		✔	✔	✔
MAP SETUP		✔	✔	✔
ASI SETUP	✔			
ALT SETUP	✔			
VSI SETUP	✔			
OAT | AMP	✔	✔	✔	✔
RPM1 SETUP	✔	✔	✔	✔
RPM2/FF SETUP	✔	✔	✔	✔
CH1~5 SETUP	✔	✔	✔	✔
VOT SETUP	✔	✔	✔	✔
OIL P SETUP			✔	✔
OIL T SETUP			✔	✔
COLT SETUP			✔	
FP SETUP				✔
TIMER SETUP	✔	✔	✔	✔
INPUT INFO	✔	✔	✔	✔
SYSTEM SETUP	✔	✔	✔	✔

3.4.1 ECU SETUP



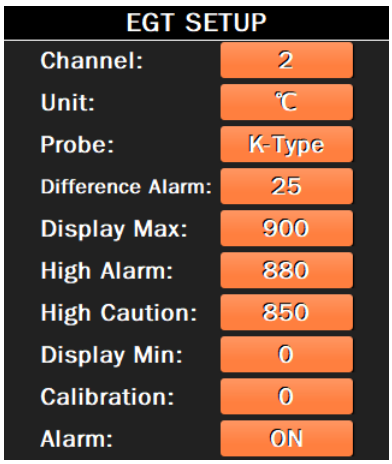
Type: ECU type, options: ROTAX91 XiS, ULPower, OFF;

Lane: ECU's Lane, options: AUTO, A(Lane A), B(Lane B), When two ECUs are connected at the same time, according to the selection in the setting, when AUTO is set, ECU A/Lane A will be displayed first, and ECU B/Lane B will be displayed if A fails;

Lane A Data: Check the data on ECU's Lane A, and if it is invalid, it will all be displayed as 0;

Lane B Data: Check the data on ECU's Lane B, and if it is invalid, it will all be displayed as 0;

3.4.2 EGT SETUP



Channel: Number of EGT channels, range from 0 to 4. Without ECU, it shares TC1 to TC4 channels with CHT (thermocouple type). EGT comes first, and when the total number of EGT+CHT (thermocouple type) exceeds 4, the excess is invalid;

Unit: Temperature units displayed, options: °C, °F;

Probe(be hidden when there is an ECU): Types of EGT sender, options: K-Type, J-Type;

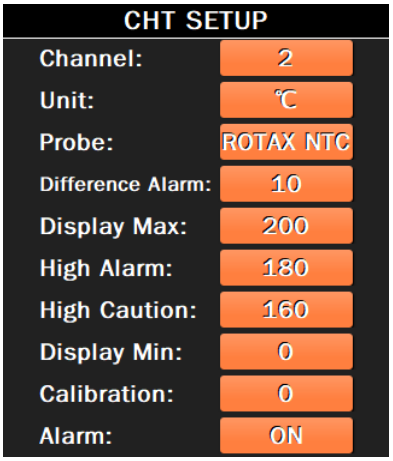
Difference Alarm: The maximum allowable temperature difference between EGT channels. When this value is exceeded, the highest and lowest channels will display red and light up the alarm light;

Display Max: Select the maximum temperature that you want the EGT/CHT bargraph to show;

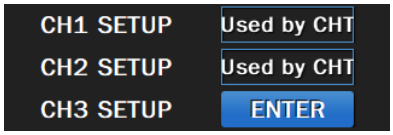
High Alarm: The high temperature threshold. Any temperature above this value

will activate the alarm and temperature display changes to red background with white text;
High Caution: Any temperature above this value, the display will changes to yellow background with black text;
Display Min: Select the minimum temperature that you want the EGT/CHT bargraph to show;
Calibration: Calibration data. When there is a deviation in the data, a correction value can be set, and the display value = original value + correction value;
Alarm: Set whether the warning lamp will light up when above or below the alarm threshold, options: ON, OFF.

3.4.3 CHT SETUP

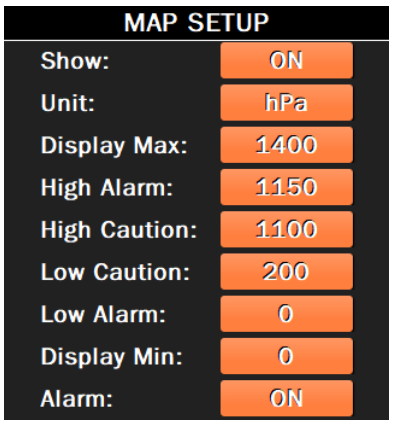


Channel: Number of CHT channels, range from 0 to 4. Without ECU, it shares TC1 to TC4 channels with EGT (thermocouple type). EGT comes first, and when the total number of EGT+CHT (thermocouple type) exceeds 4, the excess is invalid;
Unit: Temperature units displayed, options: °C, °F;
Probe(be hidden when there is an ECU): Types of CHT sender, options: K-Type, J-Type, ROTAX NTC, CH NTC;
When the sensor type is a thermocouple, the sensor is connected to TC1 to 4. When the sensor type is NTC type, it is connected to CH1 to 4 in turn according to the number of channels, covering the original settings of CHx, as shown in the following figure, when the number of channels is 2:



Difference Alarm: The maximum allowable temperature difference between EGT channels. When this value is exceeded, the highest and lowest channels will display red and light up the alarm light;
Display Max: Select the maximum temperature that you want the EGT/CHT bargraph to show;
High Alarm: The high temperature threshold. Any temperature above this value will activate the alarm and temperature display changes to red background with white text;
High Caution: Any temperature above this value, the display will changes to yellow background with black text;
Display Min: Select the minimum temperature that you want the EGT/CHT bargraph to show;
Calibration: Calibration data. When there is a deviation in the data, a correction value can be set, and the display value = original value + correction value;
Alarm: Set whether the warning lamp will light up when above or below the alarm threshold, options: ON, OFF.

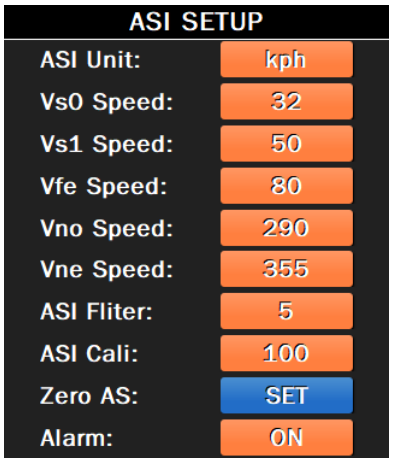
3.4.4 MAP SETUP



Show: Does manifold pressure display, options: NO, OFF;
Unit: Manifold pressure units displayed, options: hPa(mBar), inHg;
Display Max: Select the maximum pressure that you want the MAP bargraph to show;
High Alarm: The high pressure threshold. Any pressure above this value will activate the alarm and pressure display changes to red background with white text;
High Caution: Any pressure above this value, the display will changes to yellow background with black text;
Low Caution: Any pressure below this value, the display will changes to yellow background with black text;
Low Alarm: The low pressure threshold. Any pressure below this value will activate the alarm and pressure display changes to red background with white text;

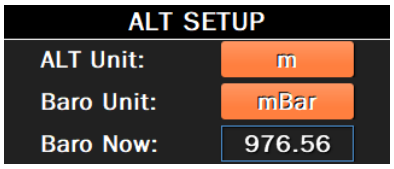
Display Min: Select the minimum pressure that you want the MAP bargraph to show;
Calibration: Calibration data. When there is a deviation in the data, a correction value can be set, and the display value = original value + correction value;
Alarm: Set whether the warning lamp will light up when above or below the alarm threshold, options: ON, OFF.

3.4.5 ASI SETUP



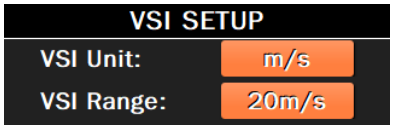
ASI Unit: Airspeed units displayed, options: kph, mph, knot；
Vs0 Speed(Min Safe Speed, Landing): Enter your minimum safe speed for landing your aircraft, when the airspeed is less than this value, the marking band is red;
Vs1 Speed(Min Safe Speed, Normal): Enter your minimum safe speed for normal flight of your aircraft, when the airspeed is less than this value, the marking band is white;
Vfe Speed(Max Flap Spee): Enter the maximum speed that is permissible with the flaps extended, when the airspeed is less than this value, the marking band is white & green;
Vno Speed(Max Maneuvering Speed): Enter your maximum maneuvering speed, when the airspeed is less than this value, the marking band is yellow;
Vne Speed(Max Exceed Speed): Enter you maximum speed you aircraft should not exceed, when the airspeed is less than this value, the marking band is red;
ASI Filter: Airspeed filter coefficient, the larger the value, the smoother the airspeed changes, ranging from 1 to 20;
ASI Cali: Airspeed correction factor, displayed(calibrated) value = original value * correction factor/100;
Zero AS: If the airspeed is not zero after standing for a period of time, press this button to set the airspeed to zero.
Alarm Set whether the warning lamp will light up when the airspeed exceeds the Vne speed.

3.4.6 ALT SETUP



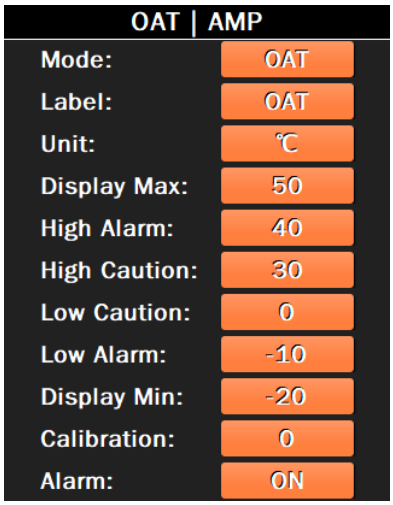
ALT Unit: Altimeter units displayed, options: m, ft;
Baro Unit: Barometric units displayed, options: mbar(hPa), inHg;
Baro Now: Current static pressure value displayed.

3.4.7 VSI SETUP



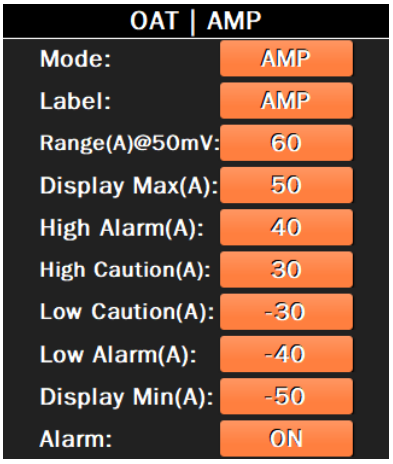
VSI Unit: Vertical speed units displayed, options: m/s, ft/min;
VSI Range: Maximum value of vertical speed scale, options: 10m/s, 20m/s, 30m/s, 40m/s or 2000ft/min, 4000ft/min、6000ft/min, 8000ft/min.

3.4.8 OAT｜AMP SETUP



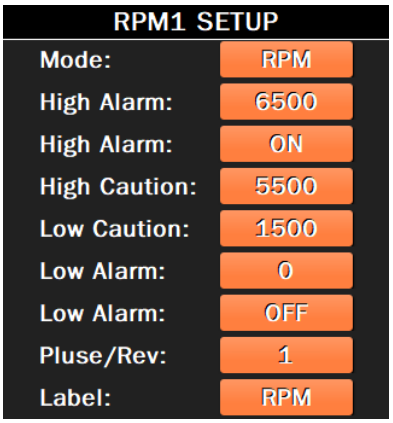
Mode: Select the data to display, options: OAT, AMP, OFF. The remaining options change accordingly based on this option.
Mode at **OAT**:
Label: The label displayed in front of the data, the label can be customized;
Unit: Temperature units displayed, options: °C, °F;
Display Max: Select the maximum temperature that you want the OAT bargraph to show;
High Alarm: The high temperature threshold. Any temperature above this

value will activate the alarm and temperature display changes to red background with white text;
High Caution: Any temperature above this value, the display will changes to yellow background with black text;
Low Caution: Any temperature below this value, the display will changes to yellow background with black text;
Low Alarm: The low temperature threshold. Any temperature below this value will activate the alarm and temperature display changes to red background with white text;
Display Min: Select the minimum temperature that you want the temperature bargraph to show;
Calibration: Calibration data. When there is a deviation in the data, a correction value can be set, and the display value = original value + correction value;
Alarm: Set whether the warning lamp will light up when above or below the alarm threshold, options: ON, OFF.
Mode at **AMP**:
Range @ 50mV: Set the specification of the shunt, that is, set the current corresponding to the 50mV voltage drop of the shunt.
For other settings, please refer to the OAT SETUP above.

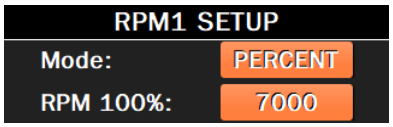


3.4.9 RPM1 SETUP

Mode: Select the type of data to display, options: RPM(number), PERCENT(%), OFF. The remaining options change accordingly based on this option.
Mode at **RPM**(number):
High Alarm: The high RPM threshold. Any RPM above this value will activate the alarm and RPM display changes to red background with white text;
High Alarm: Set whether the warning lamp will light up when above the alarm threshold, options: ON, OFF;
High Caution: Any RPM above this value, the display will changes to yellow background with black text;
Low Caution: Any RPM below this value, the display will changes to yellow background with black text;
Low Alarm: The low RPM threshold. Any RPM below this value will activate the alarm and RPM display changes to red background with white text;

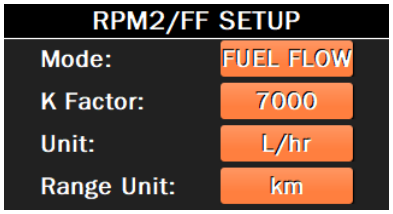


Low Alarm: Set whether the warning lamp will light up when below the alarm threshold, options: ON, OFF;
Pluse/Rev: Set the number of pulses generated per engine revolution. Please refer to the engine manual;
Display Min: Select the minimum RPM that you want the RPM bargraph to show;
Label: The label displayed in front of the data, the label can be customized;
Mode at **PERCENT**:
RPM 100%: The number of revolutions corresponding to RPM 100%;
For other settings, please refer to the RPM set above.

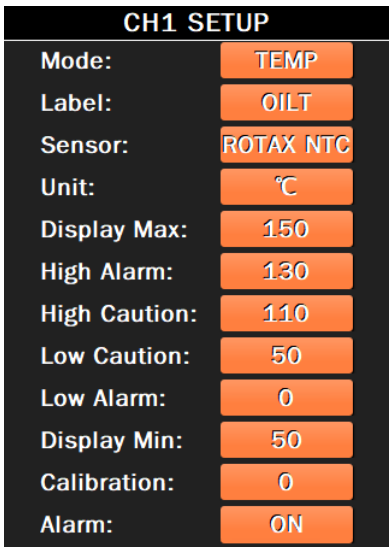


3.4.10 RPM2/FF SETUP

Mode: Select the type of data to display, options: RPM(number), PERCENT(%), FUEL FLOW, OFF. The remaining options change accordingly based on this option.
When the mode is RPM or PERCENT, please refer to the RPM1 SETUP above;
Mode at **FUEL FLOW**:
K Factor: For the K factor (K value) of the flow sender, please refer to the flow senderr manual;
Unit: Fuel flow units displayed, options: L/hr, G/hr;



Range Unit: Units of fuel cruising range, options: km, mile or n mile.



3.4.11 CH1~5 SETUP(General section)

Mode: Select the data to display, options: TEMP; PRESSURE; FUEL LEVEL; AMP; GENERIC; OFF. CH3 ~5 each has a special mode (see below). The remaining options change accordingly based on this option;

Mode at **TIME**:

Label: The label displayed in front of the data, the label can be customized;

Sensor: The type of sensor, options: ROTAX NTC; CH NTC; LM335;

Unit: Temperature units displayed, options: °C, °F;

Display Max: Select the maximum temperature that you want the TEMP bargraph to show;

High Alarm: The high temperature threshold. Any temperature above this value will activate the alarm and temperature display changes to red background with white text;

High Caution: Any temperature above this value, the display will changes to yellow background with black text;

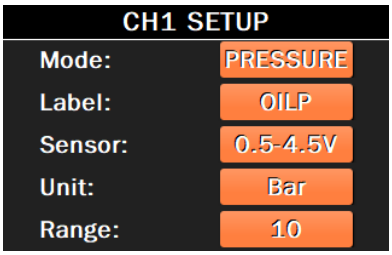
Low Caution: Any temperature below this value, the display will changes to yellow background with black text;

Low Alarm: The low temperature threshold. Any temperature below this value will activate the alarm and temperature display changes to red background with white text;

Display Min: Select the minimum temperature that you want the temperature bargraph to show;

Calibration: Calibration data. When there is a deviation in the data, a correction value can be set, and the display value = original value + correction value;

Alarm: Set whether the warning lamp will light up when above or below the alarm threshold, options: ON, OFF.



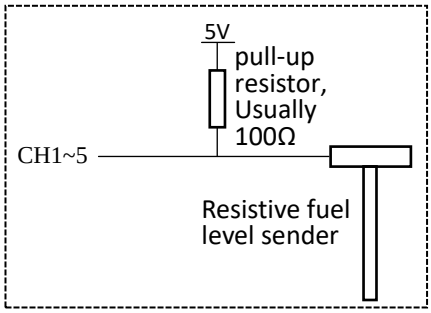
Mode at **PRESSURE**:

Sensor: The type of sende, options: 0.5-4.5V; 0-5V; 4-20mA(An additional 100Ω resistor must be connected);

Unit: Pressure units displayed, options: Bar, Psi;

Range: Range of sender;

For other settings, please refer to the TEMP set above.



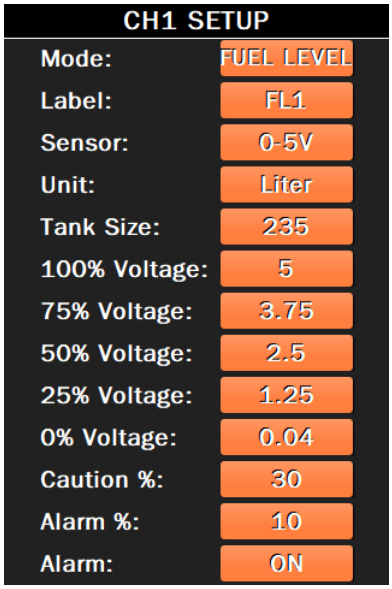
Mode at **FUEL LEVEL**:

Label: The label displayed in front of the data, the label can be customized;

Sensor: The type of sender, options: 0-5V; RESISTIVE(Add additional pull-up resistors and modify the settings of each voltage below);

Unit: Fuel level units displayed, options: Liter, Gallon;

Tank Size: The size of the tank capacity. Units are set by Unit above;



100% Voltage: Sender output voltage value when fuel level is 100%;

75% Voltage: Sender output voltage value when fuel level is 75%;

50% Voltage: Sender output voltage value when fuel level is 50%;

25% Voltage: Sender output voltage value when fuel level is 25%;

0% Voltage: Sender output voltage value when fuel level is 0%;

Caution %: Any fuel level below this %, the display will changes to yellow background with black text;

Alarm %: The low fuel level threshold. Any fuel level below this %, the display

will changes to red background with white text;

Alarm: Set whether the warning lamp will light up when above the alarm threshold, options: ON, OFF;

Mode at **AMP**:

Label: The label displayed in front of the data, the label can be customized;

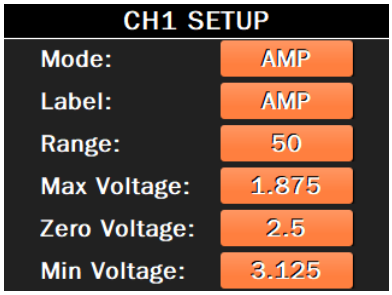
Range: Range of sender;

Max Voltage: The output voltage of the sender at the maximum forward current;

Zero Voltage: The output voltage of the sender when the current is zero;

Min Voltage: The output voltage of the sender at the maximum reverse current;

For other settings, please refer to the TEMP set above.



Mode at **GENERIC**:

Label: The label displayed in front of the data, the label can be customized;

Style: options: Color Bar; Text; Simple Bar;

Unit: Character type, can be customized;

Range: Value corresponding to voltage reaching 100%

100% Voltage: The corresponding voltage value when the sensor output is 100%;

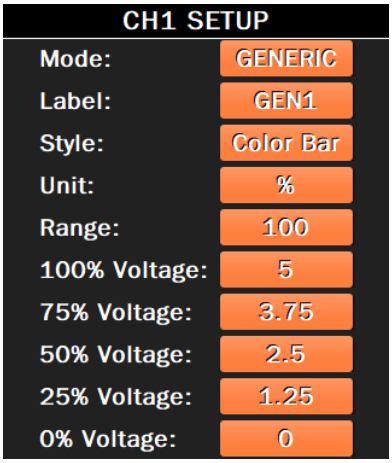
75% Voltage: The corresponding voltage value when the sensor output is 75%;

50% Voltage: The corresponding voltage value when the sensor output is 50%;

25% Voltage: The corresponding voltage value when the sensor output is 25%;

0% Voltage: The corresponding voltage value when the sensor output is 0%;

For other settings, please refer to the TEMP set above.



3.4.12 CH3 SETUP(Special section)

Mode at **THROTTLE**:

100% Voltage: The corresponding voltage value when the throttle is at 100%;

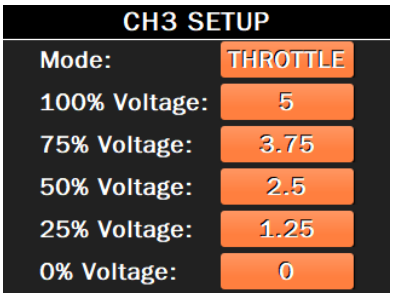
75% Voltage: The corresponding voltage value when the throttle is at 75%;

50% Voltage: The corresponding voltage value when the throttle is at 50%;

25% Voltage: The corresponding voltage value when the throttle is at 25%;

0% Voltage: The corresponding voltage value when the throttle is at 0%;

The maximum voltage value corresponding to the throttle cannot exceed 5V. If you need to adapt to a higher voltage, an external dividing resistor must be connected.



3.4.13 CH4 SETUP(Special section)

Mode at **TRIM UD**:

100% Voltage: The corresponding voltage value when the trim is at 100% (uppermost end);

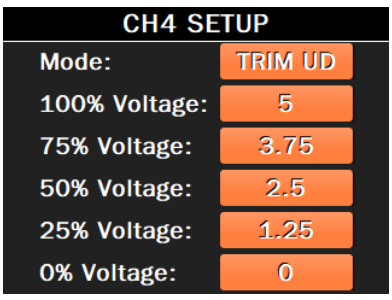
75% Voltage: The corresponding voltage value when the trim is at 75%;

50% Voltage: The corresponding voltage value when the trim is at 50%;

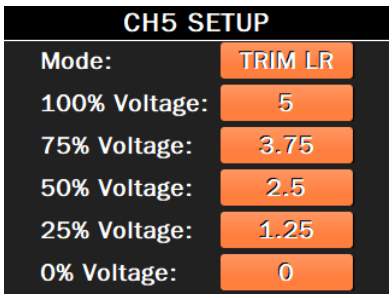
25% Voltage: The corresponding voltage value when the trim is at 25%;

0% Voltage: The corresponding voltage value when the trim is at 0%(lowermost end);

The maximum voltage value corresponding to the trim cannot exceed 5V. If you need to adapt to a higher voltage, an external dividing resistor must be connected.



3.4.14 CH5 SETUP(Special section)



Mode at **TRIM LR**:

100% Voltage: The corresponding voltage value when the trim is at 100% (rightmost end);

75% Voltage: The corresponding voltage value when the trim is at 75%;

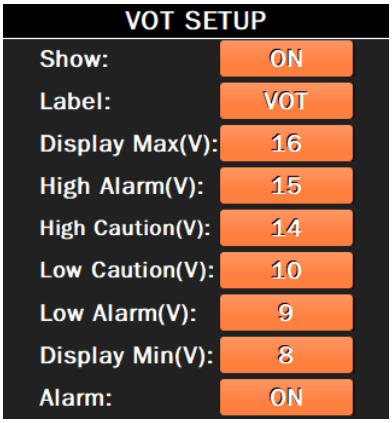
50% Voltage: The corresponding voltage value when the trim is at 50%;

25% Voltage: The corresponding voltage value when the trim is at 25%;

0% Voltage: The corresponding voltage value when the trim is at 0%(leftmost end);

The maximum voltage value corresponding to the trim cannot exceed 5V. If you need to adapt to a higher voltage, an external dividing resistor must be connected.

3.4.15 VOT SETUP

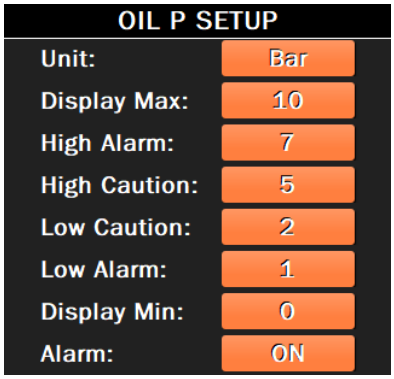


Show: Whether to display VOT, options: ON, OFF;

Label: The label displayed in front of the data, the label can be customized;

For other settings, please refer to the CH1~5 SETUP above.

3.4.16 OIL P SETUP

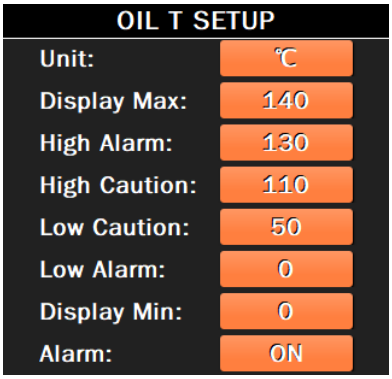


This item is only displayed when the ECU is connected, and the display data comes from the ECU.

Unit: Pressure units displayed, options: Bar, Psi;

For other settings, please refer to the CH1~5 SETUP above.

3.4.17 OIL T SETUP

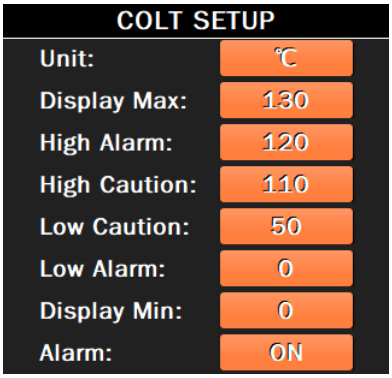


This item is only displayed when the ECU is connected, and the display data comes from the ECU.

Unit: Unit: Temperature units displayed, options: °C, °F;

For other settings, please refer to the CH1~5 SETUP above.

3.4.18 COLT SETUP

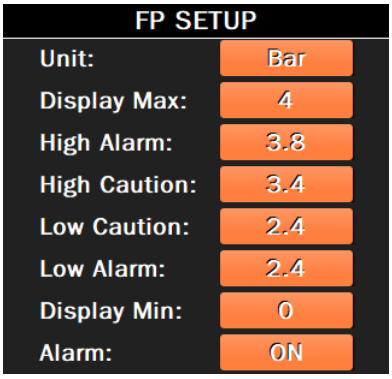


This item is only displayed when the Rotax ECU is connected, and the display data comes from the ECU.

Unit: Temperature units displayed, options: °C, °F;

For other settings, please refer to the CH1~5 SETUP above.

3.4.19 FP SETUP

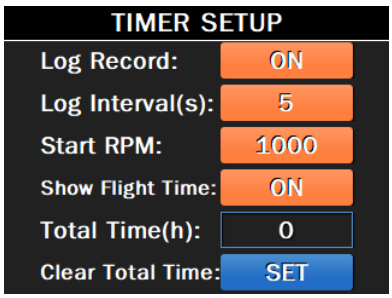


This item is only displayed when the UL Power ECU is connected, and the display data comes from the ECU.

Unit: Pressure units displayed, options: Bar, Psi;

For other settings, please refer to the CH1~5 SETUP above.

3.4.20 TINER SETUP



Log Record: options: ON(Turn on recording function), OFF(Turn off recording function);

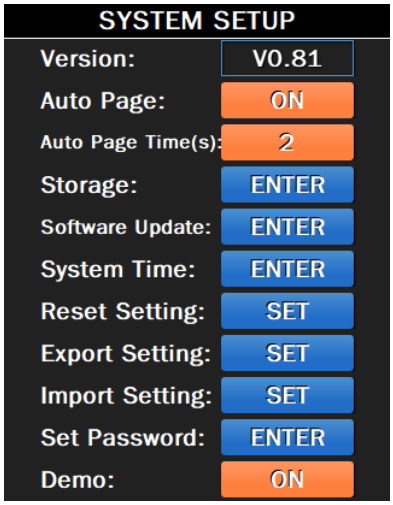
Log Interval(s): The time interval for each piece of data, in seconds, with a minimum of 0.1 seconds;

Start RPM: When RPM1 or RPM2 reaches this value for 10 seconds, the flight timing starts. If it is less than this value, the flight timing stops after 10 seconds;

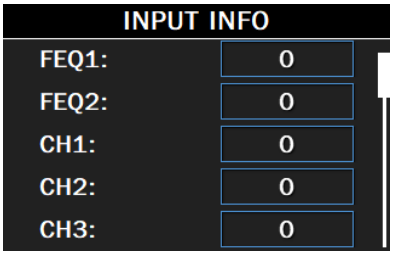
Show Flight Time: Whether the Current Time, Flight Time and Total Flight Time are displayed in the comprehensive display area, options: ON, OFF;

Total Time: Read-only, showing the total flight time of the aircraft;

Clear Total Time: Click and confirm may clear the total flight time.



3.4.21 INPUT INFO

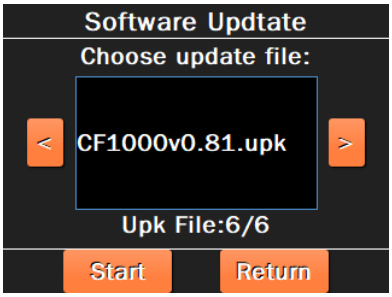


Input the raw data of the sensor for troubleshooting and can be ignored during normal use of the product.

FEQ1/FEQ2: RPM input frequency value.

CH1~ CH5: Analog signal input voltage value.

3.4.22 SYSTEM SETUP

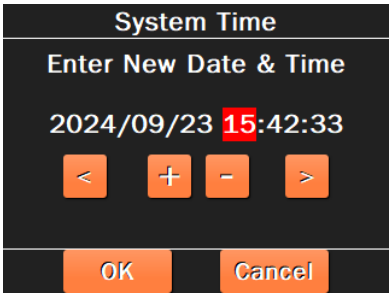


Version: Current software version;

Auto Page: Whether the comprehensive display area automatically pages, options: ON, OFF;

Auto Page Time(s): The interval time for automatically pages, in seconds;

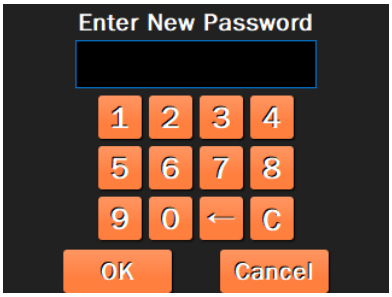
Storage: Click to enter the storage interface, which displays the remaining space of the internal memory. Click **Format** may initialize the memory;



Software Update: Click and enter the software upgrade screen, as shown below:

Prepare a micro USB cable to connect to the front micro USB interface of the CF1000, plug the other end of the cable into the computer, and then turn on the CF1000 power switch. The computer will recognize the CF1000 as a USB flash drive, copy the new software to the “UpdateFiles” folder, and then click Upgrade to enter the software upgrade interface. See the left Figure, press <, > to find the upgrade software, click Start to start the upgrade, and the program will automatically restart later.

System Time: Click to enter the system time setting screen, see the right figure: Press <, >, +, - modification time, click s OK to complete the modification;



Reset Setting: Reset all settings, including passwords;

Export Setting: Export settings. Click SET, OK to generate a file named "exConfig.ini" in the storage root directory, can view and back up after connecting to a computer;

Import Setting: Import settings. Click SET, OK to import the settings with the file name "exConfig.ini" stored in the root directory, and can be view it after connecting to your computer;

Set Password: Change the system password. Click and enter the password input interface, see the right picture; Enter the new password and click OK to set a new password. You must enter the password the next time you enter

the settings menu. The password is empty when the product is shipped from the factory. If the new password is still empty, there is no need to enter it.

If you forget your password, you can first connect the CF1000 to your computer. The CF1000 will be recognized as a USB flash drive. You can skip password entry by creating a new file named "clearpassword.txt" in the UpdateFiles folder. Reset the password and then delete this file to restore the password function.

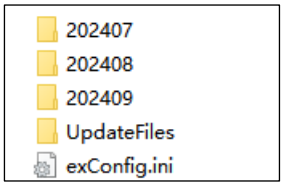
Demo: Turn presentation mode ON or OFF.

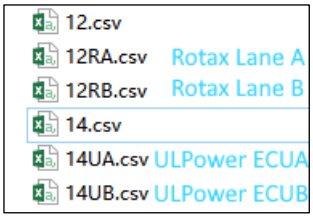
3.5 Reading of Flight Data

Connect the computer: Prepare a micro USB cable to connect to the micro USB interface on the front of AH3A, insert the other end of the cable into the computer, and then turn on the power switch of AH3A. The computer will identify AH3A as a USB flash drive.

Data Fetch: Open the newly recognized U disk folder and see the directory similar to lower right figure.

The flight data is a folder every month. When the folder is opened, there will be a data file as shown in lower left figure. The number before '. csv' represents the date.





Among them, when an ECU is connected, an R (Rotax) or U (UL Power) suffix will be added after the date, and A/B stands for LaneA/B or ECU A/B;

For documents with no suffix after the date, all data therein are collected by this product.

Data Format: Open .csv data file with Notepad or Excel, as shown in lower figure:

Time	TT	FT	OAT|AMP	RPM1	RPM2|FF	MAP	TC1	TC2	TC3	TC4	CH1	CH2	CH3	CH4	CH5	VOT
13:38.6	0	0:00:00	-80 ℃	4740	23.1 L/h	1580 hPa	299 ℃	299 ℃	233 ℃	233 ℃	232 L	232 L	11.1 Bar	-29 ℃	11.1 Bar	11.9 V
13:43.0	0	0:00:00	-80 ℃	0	0.0 L/h	0 hPa	50 ℃	50 ℃	50 ℃	50 ℃	0 L	0 L	0.0 Bar	180 ℃	0.0 Bar	12.7 V

According to the model (CF1000 FI/CF1000 EI) and ECU type, the data content is as follows:

CF1000 FI Data Format: (When CHx is set to OFF, the data displays as---)

Label	Name	Format/ Unit	Example
Time	Current Time	HH:MM:SS.mS	14:56:18.914
TT	Total Flight Time	Hours	1.3
FT	Flight Time	HH:MM:SS	0:04:55
ALT	Barometric Altitude	Data + Unit	5060 m
BAR	Static Pressure	Data + Unit	536 hPa
AS	Airspeed	Data + Unit	485 kph
TAS	True Airspeed	Data + Unit	740 kph
VS	Vertical speed	Data + Unit	7.0 m/s
OAT|AMP	Outside Air Temp | Current	Data + Unit	30 ℃
RPM1	RPM1	Data + Unit	950
RPM2|FF	RPM2| Fuel Flow	Data + Unit	24.4 L/h
CH1	Data from CH1	Data + Unit	44 L
CH2	Data from CH2	Data + Unit	1.1 Bar
CH3	Data from CH3	Data + Unit	12 %
CH4	Data from CH4	Data + Unit	24 %
CH5	Data from CH5	Data + Unit	2 %
VOT	Supply Voltage	Data + Unit	23.1 V

CF1000 EI Data Format: (When CHx is set to OFF, the data displays as---)

Label	Name	Format/ Unit	Example
Time	Current Time	HH:MM:SS.mS	08:13:38.650
TT	Total Flight Time	Hours	1.3
FT	Flight Time	HH:MM:SS	0:04:55
OAT|AMP	Outside Air | Current	Data + Unit	30 ℃
RPM1	RPM1	Data + Unit	4740
RPM2|FF	RPM2| Fuel Flow	Data + Unit	23.1 L/h
MAP	Manifold Pressure	Data + Unit	1580 hPa
TC1	Temp 1 from TC1	Data + Unit	299 ℃
TC2	Temp 1 from TC2	Data + Unit	299 ℃
TC3	Temp 1 from TC3	Data + Unit	233 ℃
TC4	Temp 1 from TC4	Data + Unit	233 ℃
CH1	Data from CH1	Data + Unit	32 L
CH2	Data from CH2	Data + Unit	22 L
CH3	Data from CH3	Data + Unit	11.1 Bar
CH4	Data from CH4	Data + Unit	29 ℃
CH5	Data from CH5	Data + Unit	11.1 Bar
VOT	Supply Voltage	Data + Unit	11.9 V

Rotax ECU Data Format:

Label	Name	Format/ Unit	Example
Time	---	HH:MM:SS.mS	08:13:38.650
RPM	Engine Speed	r/min	1254
FF	Fuel Flow Rate	L/h	31.2
MAP	Manifold Air Pressure	hPa	1015
OP	Oil Pressure, Absolute	hPa	2345
OPC	Oil Pressure, Compensated	hPa	0
OT	Oil Temperature	℃	28
CT	Coolant Temperature	℃	0
EGT1	EGT Cylinder 1	℃	367
EGT2	EGT Cylinder 2	℃	334
EGT3	EGT Cylinder 3	℃	336
EGT4	EGT Cylinder 4	℃	338
MAT	Manifold Air Temperature	℃	135.9
EAT	Engine Ambient Temperature	℃	132
TP	Throttle Position	%	0
EAP	Engine Ambient Pressure	hPa	0
VOT	ECU Bus Voltage	V	0
EState	Engine Status	-	0x01000000
DStateA	Lane A Device Status	-	0x00000000
SStateA	Lane A Sensor Status	-	0x00000000
DStateB	Lane B Device Status	-	0x00000000
SStateB	Lane B Sensor Status	-	0x00000000
ENGINEHOURS	Engine Hours	h	0

ECUHOURS	ECU Hours	h	0
BP	Boost Pressure	hPa	1
AF	Air Flow	g/min	23
TWP	Target Wastegate Position	%	45
BPE	Boost Pressure Error	hPa	101
TS	Timestamp	ms	1234

UL Power Data Format:

Label	Name	Format/ Unit	Example
Time	---	HH:MM:SS.mS	08:51:19.007
IgnitionStatus	Ignition status	-	0x04
SensorStatus	Sensor status	-	0x0c
EngineSpeed	Engine speed	1/min	1234
Throttle	Throttle position	%	34
Barometric	Static(atmo) or boost press(turbo)	hPa	1456
Airtemp	Airtemp	℃	40
OilPressure	Oil pressure	hPa	2345
OilTemp	Oil temp	℃	28
FuelPressure	Fuel pressure	hPa	1015
FuelFlow	Fuel flow	L/h	31
ECUTemp	Ecu temperature	℃	30
ECUVoltage	ECU supply voltage	V	15.3
EngineHours	Engine hours	min	1234
CHT1	CHT 1	℃	132
CHT2	CHT 2	℃	133
CHT3	CHT 3	℃	134
CHT4	CHT 4	℃	135
CHT5	CHT 5	℃	136
CHT6	CHT 6	℃	137
EGT1	EGT 1	℃	332
EGT2	EGT 2	℃	334
EGT3	EGT 3	℃	336
EGT4	EGT 4	℃	338
EGT5	EGT 5	℃	339
EGT6	EGT 6	℃	340
AUX1	AUX sensor1	V	1.12
AUX2	AUX sensor2	V	2.23
AUX3	AUX sensor3	V	3.33
AUX4	AUX sensor4	V	4.12
AUX5	AUX sensor5	V	2.12
AUX6	AUX sensor6	V	3.24
MAP	MAP(atmo) or Static press(turbo)	V	1013

3.6 Troubleshooting

Problem Description	Possible Cause	Solution
The CF1000EI/FI does not power on	On-board power supply failure, and standby battery are not connected or have been fully discharged.	Check the on-borne power supply and connection plug; verify that the standby battery has a power reserve and is connected to the back USB port.
The airspeed shown in CF1000FI does not read 0 when the actual airspeed is 0	The airspeed indicator needs zero calibration	Go to airspeed settings menu > zero calibration, see 3.4.5

3.7 Screen Care

Use a dry, clean, soft cloth to clean the screen. Do not use soap, chemicals, or abrasives to avoid damaging the screen. You may also use commercially available wipes that are designed specifically for LCD screen cleaning. soft cloth. Never use water or solvents when attempting to clean the display.

Avoid excessive pressure to the display to prevent damage to the LCD (Liquid Crystal Display). Take care to prevent impacts to the screen to prevent cracking the display.