JetCat v5.0 ECU Quick Reference

Model # P- _____   Serial # _____   ECU Ver. _____   Purchase Date _____

I/O Board LED Descriptions

Color	Name	LED On	LED Blinks
Yellow	Standby/Man.	Starter Motor engaged	Yellow & Red Blinking :
Red	Ignition On	Glow Plug is on	Recharge Battery
Red	Pump Running	Fuel pump is on	Glow Plug is defective
Green	OK / Reset…	Turbine running: throttle control active	1. If the turbine is running, the EGT is exceeding the maximum temperature. 2. If the turbine is off, **SlowDown** mode active

Yellow & Green LED Blinking : Recharge battery

Turbine Shut Down States

Code	Value	Explanation
1	R/C Off	AUX switched to **Off** position or throttle stick and throttle trim moved to the minimum position.
2	OverTemp	Turbine running over temperature. Exceeded high temperature parameter and time out.
3	IgnTimOut	Turbine did not ignite within programmed time interval.
4	AccTimOut	Turbine achieved ignition, but did not accelerate within programmed time interval.
5	Acc.Slow	Turbine achieved ignition, but acceleration was less than the programmed value, during startup.
6	Over-RPM	Turbine exceeded the maximum RPM, by 5% and a delay of 0.5 seconds.
7	Low-RPM	Turbine running under the minimum RPM, by 10% and a delay of 3 seconds. Usually triggered by a flame out.
8	BattryLow	Battery pack is dead. Cell voltage is < 1.0V.
9	Auto-Off	Turbine shut down via the **AutoOff** sequence, using the AUX channel.
10	LowTemp	EGT dropped below the minimum value. A dislodged EGT sensor can trigger this shut down.
11	HiTempOff	EGT exceeded the maximum range (~950 °C).
12	GlowPlug!	Defective glow plug.
13	WatchDog	ECU processor was locked out usually from static discharge or voltage spike in power supply.
14	FailSafe	Turbine was shut down from a failsafe timeout condition.
15	ManualOff	Turbine was shut off by using the GSU.
16	PowerFail	The power failed to the ECU when the turbine was running. This will occur if the power was lost because of a defective battery, connection or if the switch is turned off before the engine is shut-down. **Note: If this state is displayed the Info, Min/Max and Statistics menus retain information from the previous run.**
17	TempSensor Fail	EGT sensor failed. **Note: This could happen only during startup.**

To view last 4 seconds of flight:
• While pressing "+" key on GSU, switch on receiver.
• Use (+ or -) keys to scroll through data.
• Use (Info or Min/Max) keys to scroll through time.

Tim: Time	R: RPM	S: Set-RPM	EGT: Temp	Pmp: Pump V	Sta: State	Th: Thr. pulse	Au: Aux. pulse	Bat: Batt volts	AirS: Air Speed	SetS: Set Air speed

Fuel:
• Jet A1 or K-1 Kerosene with 5% oil (Aeroshell 500), 1 Quart of oil in 5 gallons of fuel.

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To Learn R/C: While pressing "Select Menu" key on GSU, switch on receiver.

CHECK FAILSAFE : Set failsafe to low throttle, low throttle trim, **100%** servo travel. Teach ECU at low throttle, low throttle trim, **75%** of servo travel.

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To Change Pump Voltage:
• While pressing "Change Value/Item" key on GSU, switch on receiver.
• "Run" key: run pump, "+" key: increase voltage, "-" key: decrease voltage
• Press "Manual" key to store new setting.

To Change Glow Plug Voltage:
• Change value in either 'Test Functions' or 'Limits' Menu.
• McCoy MC-9: 2.45-2.5V, OS A3, A5: 2.25-2.3V

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MIN / MAX

Value	Explanation
Upump-Max	Maximum pump voltage.
Upump-Min	Minimum pump voltage.
MaxTemp	Maximum EGT.
MinTemp	Minimum EGT.
AvgPump	Average pump voltage
AvgTemp	Average temperature
MaxRpm	Maximum turbine RPM.
MinRpm	Minimum turbine RPM.
AvgRpm	Average RPM
MaxRTmp	Average temperature at maximum RPM during the last run.

RC CHECK

Value	Explanation
StickPuls	Position of the throttle stick (by percentage, 0-100%). An 'F' signals a failsafe condition.
Throttle%	Position units of the throttle stick.
AuxInp%	Position of the 3-position AUX channel (0-100%).
AuxPulse	Position units of the AUX channel.
Aux.Position	Position of the AUX channel control (0=**Off**; 1=**Start/Standby**; 2= **AutoOff**)
FailSafe Count	Displays the number of times the receiver went into failsafe during the flight.
FailSafeTime (Seconds)	Displays the time the receiver was in failsafe.

INFO

Value	Explanation
Rest Fuel	Remaining fuel in tank. Tank size can be entered using the **LIMITs** menu. Value is reset every time the ECU is switched on (or can be reset manually by pressing the **Change Value/Item** key on the GSU).
Fuel Flow ml/min	Actual fuel consumption in ml/min.
BattCnd / Ubattery	The condition of the battery is indicated in the upper line: 1. --OK-- 2. !WEAK! 3. --EMPTY-- 1. If the battery voltage is 1.1V/Cell or higher "--OK--" will be displayed. 2. If the battery voltage drops under 1.1V/Cell, the display will read "**!WEAK!**". Red **Standby** and green **OK** LED's will blink simultaneously (at a rate of twice per second). Starting the turbine is not possible, until the battery is recharged. If the turbine is already running and the battery warning function is enabled, the warning function will be activated. 3. If the battery voltage drops under 1.0V/Cell "—**EMPTY**--" is displayed. Starting the turbine is not possible until the battery is recharged. If the turbine is running, it will be immediately shut off, to avoid a malfunction of the ECU. Current voltage of the battery. Displayed on bottom line.
Last Run Time	Last turbine run time.
Last Fuel Count	Quantity of fuel consumed, during the last turbine run.
Last-Off PmpVolt	Volts applied to the pump when it was switched off.
Last Off RPM	RPM of the turbine, when it was switched off.
Last Off TEMP	Temperature of the turbine, when it was switched off.
Last Off Cond	Last stored Off condition.
Last MaxTemp	Maximum temperature during the last run.
Last MinTemp	Minimum temperature during the last run.
Last AvgTemp	Average temperature during the last run.
Last MaxR AvgTmp	Average temperature during the last run at maximum RPM.
Last StartTemp	Maximum temperature during startup during the last run.
Last MaxRPM	Maximum RPM during the last run.
Last MinRPM	Minimum RPM during the last run.
Last AvgRPM	Average RPM during the last run.
Last MaxPump	Maximum pump voltage during the last run.
Last MinPump	Minimum pump voltage during the last run.
Last AvgPump	Average pump voltage during the last run.
Last FailSafeCnt	Number of failsafe conditions during the last flight.
Last FailSafeTim	Time in a failsafe condition.

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STATISTICS

Value	Explanation
Total Run-Time	Total turbine running time (excluding startups).
Runs-OK	Number of successful turbine runs, without errors.
Runs aborted	Number of turbine shut downs, caused by the ECU's safety system.
Ignitions OK	Number of successful ignitions.
Ignitions failed	Number of failed ignitions.
Starts failed	Number of failed starts.
Total fuel Count	Total fuel used.
LoBatt Cut-Outs	The number of low battery shutoffs.

TEST FUNCTIONS

Value	Explanation
Pump TestVolt	Opens fuel valve and runs the pump. Default = 0.500 volts. **Note:** Can be used to prime the pump and fuel system. Make sure the fuel line is disconnected from the turbine.
GlowPlug Power	Test and / or change glow plug voltage. Default = 2.100 volts.
GasValve Test	Test starting gas valve.
SmokerValve Test	Test smoker valve.
FuelValve Test	Test fuel valve.
Temp AD	Temperature value and offset. Analog Converter value and offset

LIMITS

Value	Explanation
Minimum RPM	Turbine idle speed
Maximum RPM	Turbine maximum speed
LowBat Warning	Battery warning function, Enabled/Disabled Default = Disabled (OFF)
Fueltank size	Actual capacity of the fuel tank in ml
LowFuel Limit	Remaining fuel in the tank when the fuel warning function activates
LowFuel Warning	Fuel warning function, Enabled/Disabled Default = Disabled (OFF)
GlowPlug Power	Glow plug voltage, The glow plug will glow with the selected voltage when the **Change Value/Item** key is pressed. Default = 2.100V
Gas Flow	Sets the amount of starting gas that will flow when the turbine is started. The range is from 10 to 100% adjustable in 10% increments.

AUX Channel Function	Remark	AUX-Learn R/C Active?	Airspeed Control
NOT USED	AUX has no function at all	No	Limiter function remains active
ON, TrbCtrl ON	AUX switch controls-> - Turbine (OFF/RUN/AutoOff) - Airspeed control	Yes	Normal function
ON, TrbCtrl OFF	AUX switch only controls-> - Airspeed control - Smoker valve (if enabled)	Yes	Normal function

Value	Explanation
FailSafe delay	Delay before the failsafe function is activated. Range = 0.1 to 20.0 seconds.
FailSafeTimeOut	Delay before turbine shuts off because of a failsafe. Range = 0.1 to 20.0 seconds.
FailSafeRPM	RPM the turbine will throttle to during a failsafe time out period. Range = Minimum RPM to Maximum RPM
Drain GasTank	If enabled, after turbine is started and throttled up, the starting gas valve will open, draining the tank. Default – Disabled (Off)

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LIMITS

Pump Menu for V 5.0K and above ECU: Press and hold LIMITS key and then press "+" key. To exit, press any blue key. 1=U-accelr1, 2=U-accelr2, 3=number of NiCad cells (6-10)

To Calibrate EGT Probe: Press "Select Menu" key, switch on receiver. Hold until "Calibrate Temp" is displayed.

Aux-ch Smoker Ctrl	Remark	Function	Test Function
DISABLED	Smoker Valve not used, always closed		
Open if AuxSw=0	Smoker Valve is opened if: (Turbine is running)	Valve opens if AUX is set to the OFF position AUX-Channel Option must be set to Enabled, Turbine control off.	The function of smoker valve can be tested with the smoker valve selection in the Test Function menu.
Open if AuxSw=2	Smoker Valve is opened if: (Turbine is running)	Valve opens is AUX is set to Auto-Off position AUX-Channel Option must be set to Enabled, Turbine control off	The function of smoker valve can be tested with the smoker valve selection in the Test Function menu.

Value	Explanation
Smoker WarnFunct	When this function is assigned a condition value and the suggested smoke system in the manual is implemented, the smoke valve is pulsed on for 0.2 seconds and off for 0.4 seconds if that condition occurs. This function can be very useful in determining several dangerous situations and giving the pilot a visual warning. This function is especially useful for the helicopter pilot that cannot have the throttle change automatically for these warnings. These are the possible settings for this function: **DISABLE,** no function **BATTERY LOW,** if the ECU battery is getting weak. **FUEL LOW,** if the fuel level reaches the pre-programmed **LowFuel Limit**. **BATTor FUEL LOW,** if any of these conditions exist. **BATT, FUEL, FAILS,** if any of these conditions exist. **FAIL-SAFE,** if the ECU is detecting a failsafe condition. **Note:** If the throttle is at idle, the smoke warning is temporarily disabled.
GPS-Receiver	Enables or disables the GPS menu for the optional GPS receiver. Default = Disabled
AirSpeed units	Set airspeed and distance display in km/h or mph.
StartUp Mode	This function allows for different engine start procedures for multi engine models. The possible methods are: **SEQUENCE,** default, with the throttle trim at maximum, start the engine by switching the AUX control to the center **START/RUN** position and then moving the throttle stick to maximum. If in single channel mode, start the engine by moving the throttle trim to maximum and then moving the throttle stick to maximum. • **THROTTLE MAX,** with the throttle trim at maximum and the throttle stick at maximum, start the engine by switching the AUX control to the center **START/RUN** position. If in single channel mode, the turbine will be started as soon as the throttle stick is set higher than 95% of maximum. • **IMMEDIATE,** with the throttle trim at maximum, start the engine by switching the AUX control to the center **START/RUN** position. If in single channel mode,

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AMA Number _____ **Expiration** _____

AMA Turbine Waiver # _____

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