User Manual - Full Version

for Electronic Speed Controller *OXIDE 1/10*

Dated: 22.5.2024

The latest version of manual you will find here

http://www.elceram-rc.cz/download/

Datum of Revision	Description

MANUAL CONTENTS

1. Introduction

Thank you for purchasing OXIDE 1/10 and for your trust in ELCERAM product. By this decision, you have chosen a new generation electronic speed controller (ESC) for brushless motors developed especially for 1/10 RC cars, endowed with many unique features and functions.

Using the advanced technologies, OXIDE is a high-performance device requiring a professional approach. Improper usage and unauthorized modification to our product is extremely dangerous and may damage the product and related devices. We, ELCERAM, are not responsible for any damages occurred by unprofessional or unsuitable way of using our product.

Please, take your time and read the following instructions carefully before you start using your ESC!

We reserve rights to modify our product design, appearance, features and usage requirements without notification.

2. Warning and Safety

- Please read all instructions carefully before using the product!
- To avoid short circuits, ensure that all wires and connections are well insulated before connecting the ESC to related devices. Ensure all devices are well connected to prevent poor connections and avoid damage to your electronic devices.
- Read through the manuals of all power devices and chassis and ensure the power configuration is rational before using this unit.
- Please use a soldering iron with the power of at least 60W to solder all input/output wires and connectors.
- The device has to be disconnected from battery if not used!
- It is the high-power electronic device, please double check the polarity of battery interconnection! We are not responsible for a product damage caused by the incorrect connection to the battery.
- It is professional top level racing product and it is extremely important to double check the setting before use!
- This product is not a toy and it is not intended for children. Users under 18 years should use this product only with the direct supervision of a

responsible and knowledgeable adult. Keep this product away from the reach of small children.

- Do not touch the device Immediately after using, it can generate high temperatures. If the temperature of ESC is higher than 70°C, the buttons can be hot. Please, wait until it cools down to 50°C before you switch it off by button, or switch the ESC from the battery for switch off.
- Stop the usage immediately once the temperature of the ESC exceeds 130°C, as this may cause damage to both the ESC and motor. We recommend setting the "ESC Thermal Protection" to 130°C (this refers to the internal temperature of the ESC).
- Never leave the device unsupervised while it is switched on, in use or connected with a power source. If a defect occurs, it could cause a damage or fire of the product or the surroundings.
- Never wrap your product in plastic film, metal foil or similar, if it is switched on.
- Never allow this product to come in contact with water, oil, fuels or other electroconductive liquids.
- Never place this product near the source of fire or very high temperatures.
- Never disconnect ESC from the battery while the motor is turning (while pressing the throttle).
- We recommend to use OXIDE together only with the compatible devices listed the chapter 4. Usage OXIDE with other devices was not tested yet and we are not responsible for any disfunctions or damages caused by using OXIDE together with unauthorized devices.

3. Key Features and Specifications

- Developed especially for 1/10th professional RC cars. Buggy, Touring, Drift, etc.
- For sensored BLDC motors from 6T up.
- Ideal solution for high level stock racing (standard, expert, open stock).
- Suitable also for modified with motors from 6T up.
- TFT LCD color display with resolution 160 x 80 pixels.
- Size: 38,3 (L) x 34,3 (W) x 20 (H) mm.
- Weight: 45 g without wires / 75 g with wires AWG14 - 180 mm.
- Ultra low centre of gravity.
- Power supply: 2S LiPo.
- Current cont. / pulsed: 145 A / 1500 A.
- BEC: 6 - 7,4 V adjustable, step 0,05 V
- Extreme low internal resistance based on silver conductive layer.
- Advanced Cooling Technology based on Aluminium Oxide Ceramic Flat Cooler.
- Designed for high level RC racing.
- Zero Timing (Blinky Mode) supported.
- Continuous BEC voltage monitoring.
- Continuous motor speed monitoring.
- RPM limiter supported.
- Revolutionary easy Rx calibration.
- Realtime monitoring: battery voltage, ESC and motor temperatures.
- Self-diagnostic before the race: motor temperature, sensor cable, battery.
- Post-race data evaluation.
- Easy programming: throttle, brake, boost and turbo timing, hall angle, BEC and many other functions.
- Race data logging, temperature and other curves, histograms and more.
- Adjustable maintenance reminder for easy check.
- No programming interface needed.
- Designed and produced in Czech Republic.
- Thoroughly tested under race conditions.

4. Compatible Devices

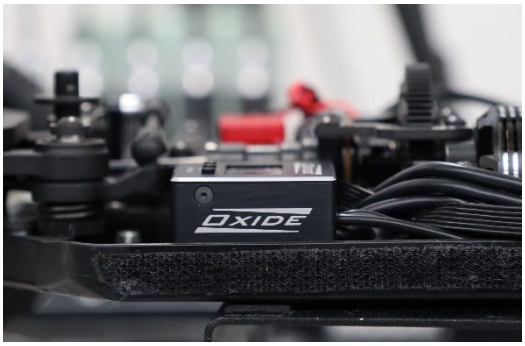
We recommend to use OXIDE together only with the compatible devices listed below. Usage OXIDE with other devices was not tested yet and we are not responsible for any disfunctions or damages caused by using OXIDE together with unauthorized devices.

Transmitters	Receivers	Motors
Sanwa MT-17	Sanwa Rx 493-i	Hobbywing
Sanwa MT-4	Sanwa Rx 482 FH4	Trinity
Sanwa MT-44	Sanwa Rx 492 FH5	LRP
Sanwa MT-5	Futaba Rx R304SB	Muchmore
Futaba T4PM Plus	Futaba R202GF-E	Yokomo
Flysky Noble Pro	Futaba R203GF-E	Konect
	Flysky FGr4v2 micro	Dash

5. Installation

OXIDE installation is very easy. You can stick it directly to the chassis of your car using the double-sided tape sticked on the Aluminium Oxide Cooler at the bottom side of ESC. The double-sided tape is included in the package. We recommend for example tape type 3M 5915.

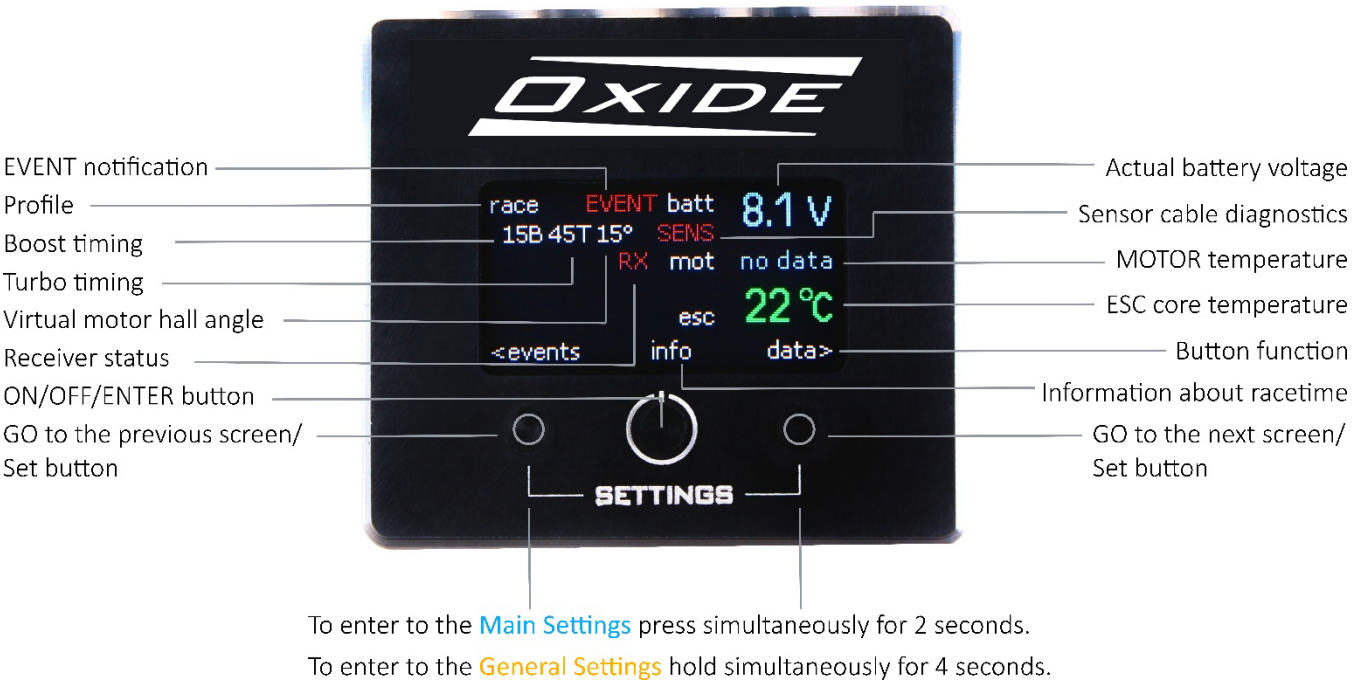
If better cooling effect desired, you can stick OXIDE on any thermal conductive plate (for example aluminium) in the car, or use the ELCERAM Advanced Passive Heatsink (ELC007).



6. Connections

! WARNING ! Please, double check the polarity of battery interconnection! Make sure, that positive (+) of ESC is connected to the positive (+) of battery. If polarity is reversed, the ESC will be damaged!

7. Main Screen Description and Basic Control of ESC



Basic Description of ESC Using

The using of ESC is very simple and there is no other programming interface needed.

Turning on

After short pressing of ON/OFF/ENTER button, the ESC will be switched on.

Turning off

If you press ON/OFF/ENTER for about 3 seconds the ESC will be switched off. The ESC can be switched off also by disconnecting from the battery (always allow motor to fully stop before disconnecting battery).

8. Programming and Screens schema

GUI uses following design patterns:

White is static text.
Blue numbers are values updated in real time.
Pink are settings that you can change.

Exception to that is main screen which is optimized for maximum readability during quick checks before race. Temperature and voltage numbers there use “semaphore” color scheme: low temperatures and full voltage are green to indicate ready for race status and they go up to red when hot and discharged.

Buttons are multifunctional. There is the help text on the display just above every button showing what will happen if you press the button. The text above the ENTER button is underlined sometimes. That means you have two possibilities depending on how long you press the button. For example: reset/next. Short press = reset, Long press = next.

Changing values: value being edited flashes, you can increase/decrease it by left and right button. These buttons can also have special meaning in rare cases - follow description above button. Values are applied immediately and saved to ESC’s internal flash memory after last item on the screen has been entered.

Features are accessible for setting in real-time, even when the motor is running. You have to be careful and have on your mind that it can cause destruction of some components if used without proper caution.

There are 3 Menu loops available - picture below:

1) Race data loop - LCD backlight Black

In this menu loop you can monitor race data and events before race, there is no ESC setup here. You can move through the Race data loop using left or right buttons. For any action on the screen press ENTER button - see the help above the button. The most of race information will be reset after the ESC is switched off. Exceptions are maintenance and data on ESC history screen.

2) Setting 1 loop - LCD backlight Blue

For entry to this Setting hold right and left button simultaneously for about 2 s. For return, hold both buttons again.

You can set all the most important parameters of your ESC for the race in this loop.

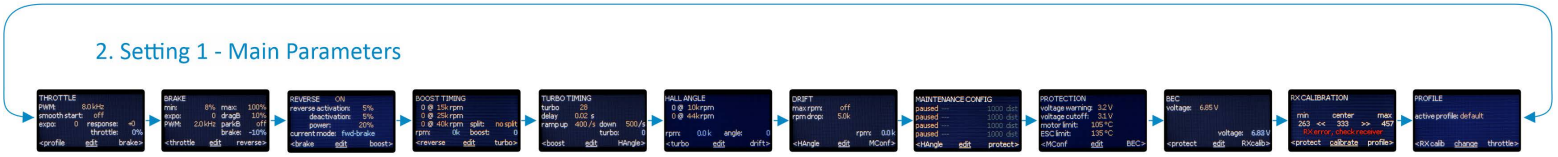
3) Setting 2 loop - LCD backlight Yellow

For entry to this Setting hold right and left button simultaneously about 4 s. For return, hold both buttons again.

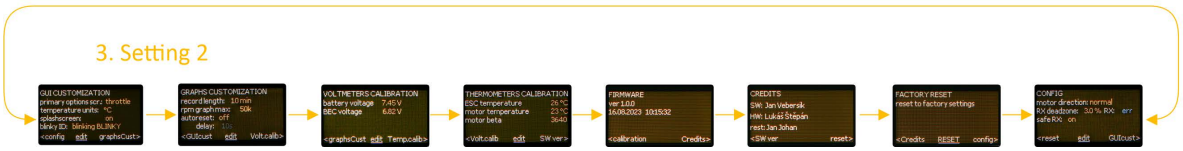
You will probably use this loop less frequently than Setting 1. Here you can set basic parameters shared across all profiles.

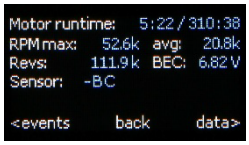
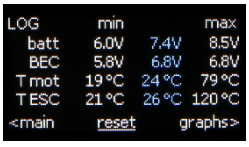
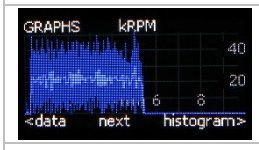
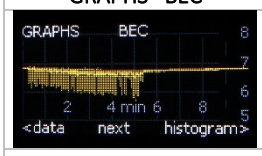
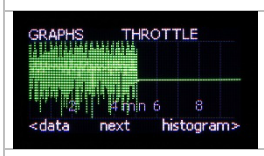
Screens schema:

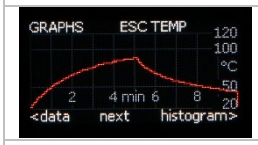
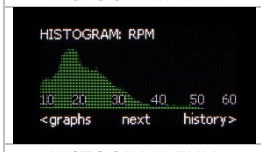
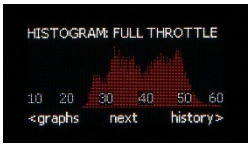
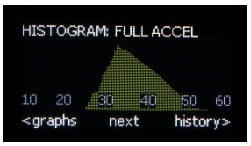
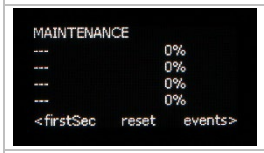
Push Settings buttons for **2** sec.

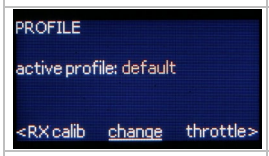
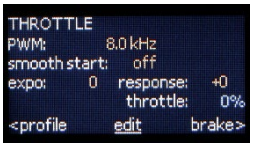
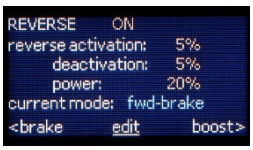
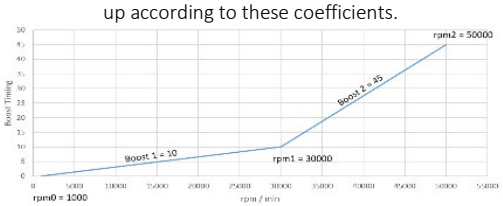


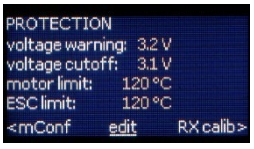
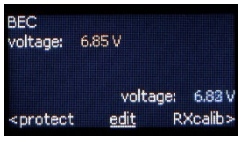
Push Settings buttons for **4** sec.

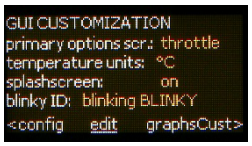
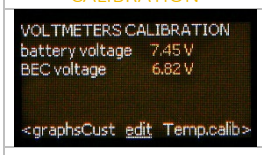
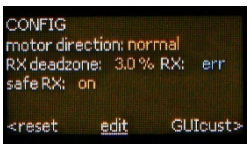


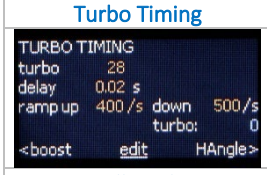
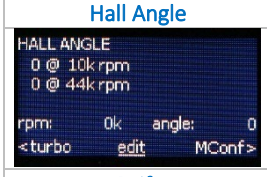
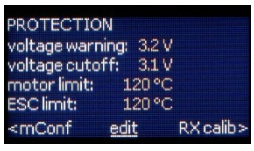
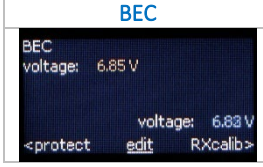
RACE DATA	Item	Comments
Main screen		
	Active profile name	In top left corner. You can switch profiles in blue PROFILE screen.
	EVENT flag	Shows up when there was at least one event generated. Flag is yellow for warning events, red if there is at least one error event. You can see the events on separate screen to the left, see description below.
	batt	Battery voltage shown in “semaphore” colors: green is fully charged, ready for race, blue is standard color, yellow and then red when discharged to the selected battery protection limit. Voltage limit can be set in blue PROTECTION screen. Number will be flashing for a moment after each battery overload.
	Timing setting	Shown in format: boost setting (with B), turbo setting (T) and virtual hall angle (°). Set timings in blue configuration screens. Special green string will be shown for stock racing with zero boost, you can customize it in GUI CUSTOMIZATION yellow screen.
	SENS flag (blinking)	Motor sensor cable problem detected. Check connector, wire insulation etc. You can use sensor readout on Main screen/info for easier diagnostics.
	RX flag (blinking)	No RX signal detected. Most likely you do not have your transmitter turned on. For more troubleshooting tips check later chapters of this manual. There is a numerical Rx value in this place if radio link is established.
	mot	Motor temperature. Color scheme is “semaphore” – green = cold, ready for race; blue = standard readout, yellow and red= heated up to the selected limit. Motors without temperature sensor will show “no data”.
	esc	ESC temperature. Color scheme is “semaphore” – green = cold, ready for race; blue = standard readout, yellow and red= heated up to the selected limit. Temperature limits are set in blue PROTECTION screen.
Main screen/info		
	Motor runtime	First number: how long was motor running during this session, second number: length of this session. Session starts at power up and ends when you turn the ESC off.
	RPM max	Highest rpm reached during this session
	avg	Average rpm in this session. Computed only from the time when motor was turning (first number on top line)
	Revs	Motor revolutions in this session.
	BEC	BEC voltmeter. You can set required voltage in BEC blue settings screen.
	Sensor	Input from motor sensor cable. Normally in blue, one or two letters shown. Shown in red if an invalid state is detected. Turn the motor one full revolution to check all signals from motor.
LOG	Screen shows minimum, current and maximum values recorded during this session.	
	Batt	Battery voltage
	BEC	BEC voltage
	T mot	Motor temperature
	T ESC	ESC temperature
GRAPHS kRPM		
	Shows motor rpm history during this session. Horizontal axis is in minutes, vertical in thousands of rpm. You can customize axes in yellow “GRAPHS CUSTOMIZATION” screen. Darker blue shows extremes, averages are brighter.	
GRAPHS BATTERY		
	Shows battery voltage history during this session. Horizontal axis is in minutes, vertical in volts. Darker yellow shows extremes, averages are brighter. You can customize horizontal axis scale in yellow “GRAPHS CUSTOMIZATION” screen.	
GRAPHS BEC		
	Shows BEC voltage history during this session. Horizontal axis is in minutes, vertical in volts. Darker yellow shows extremes, averages are brighter. You can customize horizontal axis scale in yellow “GRAPHS CUSTOMIZATION” screen.	
GRAPHS THROTTLE		
	Throttle position history during this session. Horizontal axis in minutes, vertical from full brake to full throttle. Darker green shows extremes, averages are brighter. You can customize horizontal axis scale in yellow “GRAPHS CUSTOMIZATION” screen.	

GRAPHS ESC TEMP	
	ESC temperature history during this session. Horizontal axis in minutes, vertical is temperature. You can customize temperature units in GUI CUSTOMIZATION yellow screen and horizontal axis scale in yellow "GRAPHS CUSTOMIZATION" screen.
GRAPHS MOTOR TEMP	
	Motor temperature history during this session. Horizontal axis in minutes, vertical is temperature. You can customize temperature units in GUI CUSTOMIZATION yellow screen and horizontal axis scale in yellow "GRAPHS CUSTOMIZATION" screen.
HISTOGRAM RPM	
	Histogram of motor rpm during this session. In this case motor have spent most time just below 20k rpm and only very small time above 40k. Use this histogram to optimize your car and/or driving habits: most of time on this track is spent in rather slow speed and you should focus on car control these regimes.
HISTOGRAM FULL THROTTLE	
	Histogram of motor rpm when on full throttle. Similar to rpm histogram but time at brake or partial throttle is not shown here. Use this histogram to optimize your motor power and/or driving habits: your car has spent most of time at low speed but you do not need more power there because you only need press the throttle more. But you are using full power above 30k and getting more power there through ESC settings or different motor or gearing etc. would be beneficial. For more power at slower speeds, you may consider using throttle expo.
HISTOGRAM FULL ACCEL	
	Similar to full throttle histogram but this one is biased towards time when you *begin* to use full power. Rationale behind this is simple – you have to optimize power at the beginning of straights, because any velocity advantage you gain here helps you to be faster during whole time until braking. In our example, car has spent most time below 20k (green histogram), went on straights between 30 and 50k (red histogram), but most important accelerations and most power needs are just above 30k rpm (this histogram). Use this histogram to optimize your motor power and/or driving habits: explore the envelope, find most important power needs and optimize drivetrain accordingly.
HISTORY	
	These are values collected during whole ESC's lifetime. They cannot be reset. Please note: these are not zero when you buy new ESC – values come from output stress tests in the factory.
MAINTENANCE	
	List of tracked maintenance items together with their current life cycle percent. See MAINTENANCE CONFIG blue screen for instruction how to set it up. Press middle button and choose an item to reset it to zero.
EVENTS	
	List of events generated in this session. Time of first occurrence is on the left, event count is on the right. See later chapter of this manual for more info on event system.

SETTING 1	Parameter Name	Default value	Typical value	Min. value	Max. value	Comments
Profile						
	You can choose active profile here. Each profile has its own set of parameters (blue screens, listed below).					
Throttle						
	PWM	8 kHz	8 kHz	0.1 kHz	45 kHz	Lower PWM frequency = more current through motor and more aggressive throttle response
	expo	0	0	-64	+64	Zero = linear / line Positive expo = logarithmical curve = more mid throttle power Negative expo = exponential curve = less mid throttle power
	response	0	0	-15	+10	Changes sensitivity of your throttle. Bigger value means quicker response of the throttle Use positive value if you want sharp reactions and you have quality transmitter/receiver combo. Use negative value if you want calmer, less nervous behavior.
Brake						
	min	0 %	5 %	0 %	50%	Initial brake force – at the point where you move the throttle from neutral position to the brake. If Drag brake is activated, min brake = drag brake
	max	100 %	95 %	1 %	200 %	Maximum brake force
	expo	0	0	-125	125	Zero = linear / line Positive expo = more mid brake Negative expo = less mid brake
	dragB	off	10 %	0 %	100 %	Drag brake: amount of brake when the throttle is in neutral position
	PWM	2 kHz	2 kHz	0.1 kHz	45 kHz	Brake PWM frequency. Lower value = more current through motor during braking = more aggressive brake
	parkB	off	off	off	on	Park brake: brakes will be fully engaged when the car is stationary
Reverse						
	activation	5 %	5 %	1 %	50 %	Percentual position of brake for activation of reverse. You have to go across this threshold twice to activate reversing.
	deactivation	5 %	5 %	0 %	50 %	Percentual position of throttle for deactivation of reverse. ESC will switch back to braking mode once you add more power than deactivation threshold.
	power	20 %	20 %	1 %	100 %	Power limit when reversing. More power = more speed during reverse, less power = better control
Boost Timing						
	rpm 0	15000	5000	1000	48000	Boost timing will add power to the motor at the price of increased power draw, higher temperatures and lower efficiency. It is always zero in low rpm and then can go up according to these coefficients. 
	rpm 1	25000	20000	2000	49000	
	rpm 2	50000	50000	3000	50000	
	boost1	0	0	0	63	
	boost2	0	0	0	63	
Turbo Timing	Turbo timing has same effect as boost timing but is activated at full throttle.					
	turbo	0	40	0	63	Turbo timing amount. More value = more top speed and battery strain.
	delay	0.2 s	0.03 s	0.00 s	1.00 s	Required time at full throttle until turbo activates
	ramp up	100 / s	300 / s	10 / s	1000 / s	Higher value = faster turbo increase. When Rx reaches full throttle, system will wait *delay* time and then the timing will increase at *ramp up* rate until *turbo* value is reached.
	ramp down	100 / s	300 / s	10 / s	1000 / s	More Ramp down = faster turbo decrease

Hall Angle	Similar function like mechanical timing by motor but in specific rpm range using software. It brings more power efficiency for your ~~power~~ system.					
	rpm 0	10000	30000	5000	49000	Start of Hall Angle increase
	rpm 1	44000	45000	6000	50000	End of Hall Angle increase
	hall angle	0	0	0	63	This value of mechanical timing = Hall angle will be progressively reached between rpm0 and rmp1. The hall angle value will be kept above rpm1 at constant level.
Drift						
	max rpm	off	45000	10000	60000	Max. rpm value limits motor rpm. You can use this for example to protect drivetrain from excessive rpm in air on jumps.
	Rpm drop	5	5	0	10	Rpm will have to drop this amount before motor power will be reengaged. If you set rpm drop for example 5k and max. rpm 50k, the rpm will be fluctuating between 45k - 50k.
Maintenance	Using this function, you can keep track of the wear of components of your car. Each line contains four values:					
	status	Paused = maintenance item disabled On = maintenance item set up and running Silent = up and running but maintenance events will not be generated				
	item name	name of item to track				
	number	Selected motor runtime in minutes or motor revolutions in distance units (depending on next option)				
	dist/min	Switches between minutes or runtime or distance covered. 1 distance unit = 100.000 rotations of motor. That is distance usually covered in approx. one 5 min race (depending on track and gear ratio).				
Protection						
	voltage warning	3.6 V	3.4 V	3.1 V	4.1 V	ESC begins to limit power when battery voltage drops to this value
	voltage cutoff	3.4 V	3.3 V	3.0 V	4.0 V	ESC power will be reduced to zero when battery voltage drops to this value
	motor limit	100 °C	100 °C	70 °C	150 °C	ESC begins to limit power when motor reaches this temperature
	ESC limit	125 °C	125 °C	125 °C	150 °C	ESC begins to limit power when ESC reaches this temperature
BEC						
	voltage	6.00 V	6.00 V	6.00 V	7.4 V	Using this value, you can change BEC voltage for your servo and receiver in 0.05V steps. ~~Expected accuracy is +/- 2 %.~~ Higher voltage means more speed and power for your servo. If the battery voltage is below approx. 7.8 V, BEC voltage output will be decreased accordingly because of voltage drop on the switching regulator.
Rx Calibration						
	**! WARNING !** Keep the sensor cable disconnected during the first power on until ESC is calibrated with your radio system, to avoid unexpected motor start! Hold calibrate (middle) button for 1s to activate. Push full throttle, full brake and return to neutral. Push Ok button to confirm. The calibration is done. Calibration is shared across all profiles.					

SETTING 2	Item	Comments
GUI CUSTOMIZATION		
	Primary options screen	Sets up which blue settings screen shows up first. All of them will be accessible through left/right buttons, this just allows you to set up fast access to your favorite one.
	Temperature units	°C or °F
	Splashscreen	ELCERAM splashscreen enable. Pease not that disabling splashscreen will not speed up boot – ESC starts controlling motor as soon as valid Rx signal is received regardless of screen content.
	Blinky ID	Customizes main screen identification if you have no timing set up (stock category).
GRAPHS CUSTOMIZATION		
	Record length	Horizontal axis range in minutes
	Rpm graph max	Rpm (blue) graph vertical axis range
	autoreset	On = system starts to record data from fresh after specified period of inactivity. Use this if you need to have ESC powered up for a long time before race and want to have graphs showing the race.
	Delay	Minimum inactivity period for autoreset which will cause reset
VOLTMETERS CALIBRATION		
	Battery voltage	Voltmeter is calibrated from factory. Edit this number if recalibration is needed. See chapter below for details.
	BEC voltage	Voltmeter is calibrated from factory. Edit this number if recalibration is needed. See chapter below for details.
THERMOMETERS CALIBRATION		
	ESC temperature	Thermometer is calibrated from factory. Edit this number if recalibration is needed. See chapter below for details.
	Motor temperature	Thermometer is calibrated from factory. Edit this number if recalibration is needed. See chapter below for details.
	Motor beta	Characteristics of motor thermometer. Obtain exact value from motor manufacturer to get precise data. Default value of 3640 is acceptable for most motors.
FIRMWARE		
	Firmware version and manufacture date of this batch of CPU board.	
FACTORY RESET		
	This will reset ESC settings to factory values. Please not that history will *not* be erased (see black HISTORY screen).	
CONFIG		
	Motor direction	Choice between normal/reversed rotation.
	RX deadzone	Deadzone close to min/neutral/max. This is necessary to compensate for transmitter mechanical inaccuracy. You can try to decrease this number if you have high quality radio set, increase in case of any problems.
	Safe RX	Safe Rx will prevent motor from suddenly turning during power up if you have the throttle pressed. You have to return the throttle to neutral before going forward.

Setup sheet	Parameter	TC Car STOCK carpet	TC Car STOCK asphalt	TC Car Stock carpet	2WD STOCK carpet	2WD STOCK carpet	4WD STOCK carpet	4WD STOCK carpet	Default value
Motor Rotor (mm)		13.5T	13.5T	17.5T	13.5T	17.5T	13.5T	17.5T	-
Motor Timing (°)		-	-	-	-	-	-	-	-
Active FAN		No	No	No	No	No	No	No	-
Throttle	Lower PWM frequency, more current through motor and more aggressive throttle response								
	PWM	1 kHz	2 kHz	1 kHz	1 kHz	1 kHz	1 kHz	1 kHz	8 kHz
	expo	0	0	0	0	0	0	0	0
Brake	Lower PWM frequency, more brake torque, more aggressive brake response								
	min	10 %	10 %	10 %	10 %	15 %	10 %	10 %	0
	max	125 %	125 %	150 %	125 %	125 %	100 %	100 %	100 %
	expo	0	0	0	0	+20	0	0	0
	dragB	off	off	off	off	off	off	off	off
	PWM	2 kHz	2 kHz	1,5 kHz	2 kHz	2 kHz	2 kHz	2 kHz	2 kHz
Boost Timing	More boost timing, more power in rpm range, less efficiency of power system								
	rpm 0	-	-	-	-	-	-	-	15000
	rpm 1	-	-	-	-	-	-	-	25000
	rpm 2	-	-	-	-	-	-	-	40000
	boost1	-	-	-	-	-	-	-	0
	boost2	-	-	-	-	-	-	-	0
Turbo Timing	More turbo value, more top speed. More ramp up = faster turbo increase								
	turbo	-	-	-	-	-	-	-	0
	delay	-	-	-	-	-	-	-	0.2 s
	ramp up	-	-	-	-	-	-	-	100 / s
	ramp down	-	-	-	-	-	-	-	100 / s
Hall Angle	Hall Angle = SW controlled Mechanical timing. More hall angle, more rpm, less torque, less efficiency of power system								
	rpm 0	-	-	-	-	-	-	-	10000
	rpm 1	-	-	-	-	-	-	-	44000
	hall angle	-	-	-	-	-	-	-	0
Drift									
	-	-	-	-	-	-	-	-	-
Protection	**! Warning** voltage cutoff ~~is~~ below 3.4 V can decrease life of your batteries and/or cause direct damage to your battery								
	voltage warning	3.2 V	3.2 V	3.2 V	3.2 V	3.2 V	3.2 V	3.2 V	3.6 V
	voltage cutoff	3.1 V	3.1 V	3.1 V	3.1 V	3.1 V	3.1 V	3.1 V	3.4 V
	motor limit	105 °C	105 °C	105 °C	105 °C	105 °C	105 °C	105 °C	100 °C
	ESC limit	125°C	125 °C	125 °C	125 °C	125 °C	125 °C	125 °C	125 °C
BEC									
	6 V	6 V	6 V	6 V	6 V	6 V	6 V	6 V	6 V

9. RX Calibration

! WARNING ! Keep the sensor cable disconnected during the first power on until ESC is calibrated with your radio system to avoid unexpected motor start!

! WARNING ! We recommend to use one of the radio control systems compatible with OXIDE – listed in chapter 4. The table will be extended during the time.

! WARNING ! If you have Futaba Radio system, please reverse throttle on the transmitter before first turn on!

For radio system calibration, choose the RX CALIBRATION in the Blue menu (picture above) using the buttons. Press calibrate button and hold it for approx. 1s. Push full throttle, full brake and return to neutral. Then press the Ok button. The calibration is done.

10. Temperature and Voltage Calibration

ESC Temperature Calibration

The temperature of your ESC was calibrated in factory. If needed you can re-calibrate it.

For this case use the thermometer for ensuring the ambient temperature. Then choose the THERMOMETERS CALIBRATION in the Yellow menu (picture below) using the setting buttons. Set the ESC temperature according to the ambient temperature using edit button and then +/- buttons and press Ok. The temperature calibration is done.

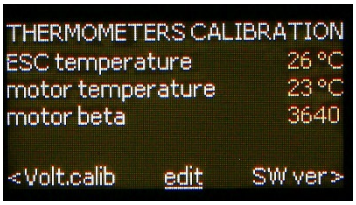
! TIP ! The calibration should be finished short time after switching on, because ESC heats up itself.

Motor Temperature Calibration

If temperature NTC sensor is included in your motor, the motor temperature has to be calibrated.

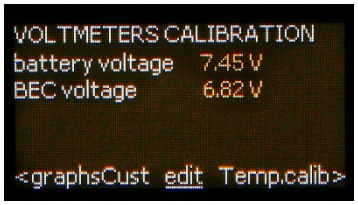
For motor temperature calibration let the car with motor to stabilize in ambient temperature for approx. 20 minutes without using. Choose the THERMOMETERS CALIBRATION in the Yellow menu (picture below) using setting buttons. Set the motor temperature according to ESC temperature using +/- buttons. Then press Ok. The temperature calibration is done.

! TIP ! In some cases, you will need to change motor beta dependence according to temperature sensor used by motor manufacturer. Default value 3640 is acceptable for most motors.



Battery and BEC voltage Calibration

Measure battery/BEC voltage using a multimeter. Then choose the VOLTMETERS CALIBRATION in the Yellow menu (picture below) and set the measured value using edit button and +/-.

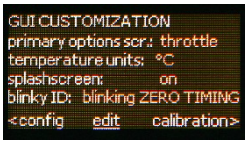


11. Zero Timing / Blinky / Stock Mode

OXIDE also supports the Zero timing / Blinky / Stock mode.

Switching to Zero Timing Mode

If all of these parameters - Turbo Timing, Boost Timing and Hall Angle in Blue menu (Setting 1) - are set to 0, the ESC is switched to Zero Timing Mode. In this case, the inscription “ZERO TIMING” is blinking green on the main screen.



Alternatively, the user can change this sign for the inscription “BLINKY” or “STOCK” and choose, if the inscription will be static or blinky. The option can be made in Yellow menu (Setting 2): Setting 2 → Gui Customization → blinky ID

Changing of inscription does not affect the function of Zero Timing Mode, it´s just an ID to display on main screen. Please use ID which complies with rules of races you are in.

Switching the Zero Timing Mode Off

If any of these parameters - Turbo Timing, Boost Timing or Hall Angle - are set to a different value than 0, the Zero Timing mode is switched off and the inscription “ZERO TIMING” disappears from the display.

12. The Motor Choice

OXIDE was tested with the most of sensored motors available on the market, with or without temperature sensor. If motor has no temperature sensor, “no data” will be displayed.

OXIDE has very linear and smooth throttle characteristics especially if boost timing is set to zero. From this point of view consider carefully the choice of your Motor Turns.

For motor type recommendation for use in various types of RC cars at various track types, please refer to the Setup sheet in chapter 8.

13. Troubleshooting and EVENTs Description

OXIDE has revolutionary self-diagnostics and you can see the event notifications before and after race immediately on the display.

The example of the events you can see in the picture bellow:

These events inform you that:

In the time 0:00 the ESC has no Rx signal from your Receiver.

In the time 0:12 was your battery overloaded with high current consumption. This happened 2 times during this session.

In the time 0:20 you reached maximum temperature limit of your motor. Your motor was hotter than limit more than 99 times in this session.

Description of Possible Events:

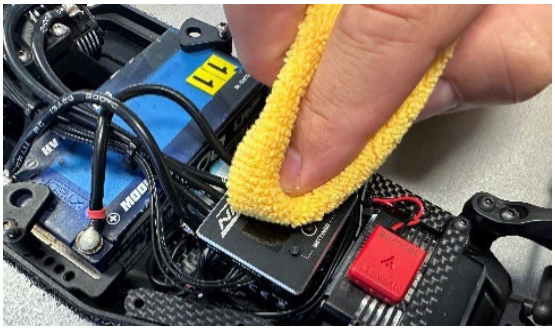
Displayer	Event Description, common problems and Recommendation
no Rx signal	The ESC does not see a signal from your receiver - Rx. Will be displayed if you switch on ESC before the transmitter is turned on. Transmitter and Receiver not paired. Bind your radio system.
sensor cable	Data from motor sensors are invalid - check your sensor cable connection
motor temp limit	Motor reached “motor limit” temperature - ESC starts to limit max. power
motor temp OVER	Motor temperature exceeded “motor limit” + 5 °C - Motor power will be reduced to the minimum
ESC temp limit	ESC reached “ESC limit” temperature - ESC starts to limit max. power
ESC temp OVER	ESC reached “ESC limit” + 5 °C - ESC power will be reduced to the minimum
battery EMPTY	Battery was discharged below “voltage cutoff” level
low battery	Battery was discharged below “voltage warning” level
battery overload	Current flow was too high for your battery - reduce boost timing, use motor with more turns, get bigger/stronger/less worn battery
unexpected reset	Current flow was extremely high for your battery and subsequent voltage drop caused ESC reset. Session data are lost and all graphs etc. will start from this moment. Reduce boost timing, use motor with more turns, get bigger/stronger/less worn battery.
maintenance interval	At least one of your maintenance counters reached 100%
MAINTENANCE INTERVAL	At least one of your maintenance counters reached 200%. Lifetime of an item is not tracked beyond 200%.
check RX cable	Poor Rx signal from receiver (noise in data). Check Rx connector, check Rx cable. Verify Rx calibration.
flash read error	Some settings or history will not be saved. Flash memory may be worn out. Try reset to factory settings.
flash write error	Some settings or history will not be saved. Flash memory may be worn out. Try reset to factory settings.
BEC voltage low	BEC voltage under 2V. May be generated by servo in big crashes or battery voltage dips during battery overload. Check insulation of Rx and servo cables for possible short circuit. Bad servo motor, replace servo.

Additional Troubleshooting

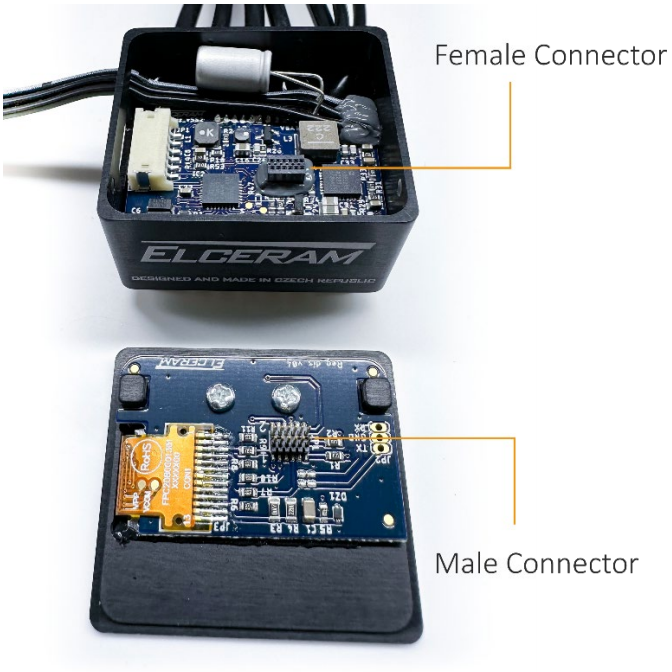
Problem	Cause	Solution
Display is frozen, white or any other visible artifacts are present	Dirty connector or contact momentarily lost during crash	- Hold settings buttons to reset display. - Check and clean the connector. - Use new cover.
Motor is tugging and ECS temperature rises	Wrong phase connection	Check cables to motor (A B C).
BEC voltage drops or inaccurate	Discharged battery or battery voltage dips	BEC voltage will be always slightly below battery voltage. High motor draw makes therefore both battery and BEC voltage to drop. Typical BEC voltage accuracy is +-2% due to extreme nature of ESC (size/weight/temperatures).
Motor does not run	Red “RX” flashing on main screen? ➔ Rx problem	Turn on transmitter. Check BEC cable to receiver. Re-calibrate Rx
	Red “SENS” flashing on main screen? ➔ Sensor cable problem	Check sensor cable and connectors – use main screen/info to verify signals.
	Rx number on main screen is not blue? ➔ ESC protection active	Safe Rx active – return throttle to neutral. Overheat/undervoltage – see below
	Voltage number on main screen is red? ➔ Discharged battery or incorrect protection setup	Charge battery or battery protection not set up correctly – re-calibrate battery voltmeter and check blue “Protection” screen.
	Temperature on main screen is red? ➔ Motor or esc overheated	let it cool down
Motor temperature shows “no data”	Sensor cable fault.	Replace sensor cable.
	Motor has no temperature sensor	Replace motor.
	Too low ambient temperature	ESC is not able to measure temperatures deep below freezing point. Wait for motor to warm up.
Motor temperature starts at strange temperature and then settles down.	Motor uses temperature signal for other purposes for some time after power up.	Some motor manufacturers do this. Just wait for temperature to settle down or replace motor for well behaving.

14. Display and Maintenance

Display is very resistant and does not need any maintenance. We suggest cleaning using microfiber cloth – see picture on the right side.



! TIP ! For unscrewing use the allen key screwdriver 0,05 " / 1,27 mm



Please be informed, that the cover with display and buttons is replaceable in case of any incident – spare part number ELC009.

There is very reliable connector in your ESC. During mounting you have to avoid any dust contamination or damage of the female part on control board – see picture on the left.

There is very small probability that the image on display will be frozen or display will turn backlight to white after big car crash. This can happen because of display connector losing contact for a short time. In this case you can reset display by holding settings buttons the same way as to switch to Blue Setting.

15. Option parts

Part number	Description	Picture
ELC009	**New OXIDE Aluminium Cover** with display and buttons. Allen key Tool 0,05 '' (1,27 mm) and new screws included	
ELC004	**Universal Graphite Plate** 50 x 60 x 1 mm	
ELC005	**External Low ESR Capacitors** soldered on the ceramic PCB with thick silver layer	
ELC010	**ELCERAM RC Cables** AWG14 - 1 m	
ELC007	**ELCERAM Advanced Passive Heatsink**	

16. Recycling

Electronic devices marked with the crossed-out dustbin symbol must not be disposed of in normal household waste, but must instead be handed in at a specialized collection and recycling facility.

17. Conformity and Declarations

The producer, company ELCERAM a.s., hereby declares that Electronic Speed Controller OXIDE 1/10 complies with the requirements of relevant directives, regulations and harmonized European standards.

The full text of the EU Declaration of Conformity is available at following website: www.elceram-rc.com.