digital controlled devices

dicodes

2380 / 2380T

manual

01 dicodes 2380 / dicodes 2380T

The dicodes 2380 is an electronically controlled MOD to be used with various atomizers of different sizes and diameter. It is prepared to use one or two stacked batteries (18350/18500/18650 batteries). The name 2380 stands for 23mm diameter and up to 80W power. The headpiece has a slightly bigger diameter ring so that any atomizer in the range 20 to 23mm optically fits perfect onto the device. The dicodes 2380 can provide temperature controlled vaping with many different kinds of wire-materials (dicodes-wire, nickel, titan, appr. stainless steel, and others). We recommend the dicodes-wire for optimal performance and unique liquid flavor.

The product is offered in two versions

a) with different length tube pieces to have one 18350 or 18500 or 18650 battery or two stacked batteries of (2x) 18350 or (2x) 18500 (2x 18650 is possible by using a separately offered extension tube)

b) as a telescope version dicodes 2380T with additional tube pieces

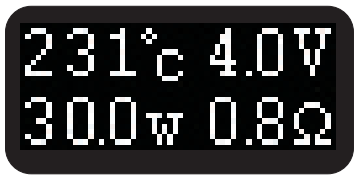
02 Features

- 5 to 40W with one Li-Ion battery
- 5 to 80W with two Li-Ion batteries
- Adjustable battery discharge level (2.5-3V and 6.2-6.8V)
- Up to 12V output voltage (one or two batteries)
- Up to 15A output current
- Temperature controlled vaping mode with various wire-types
- Mechanical MOD mode (protected)
- 10 Power boost modes
- 10 Heater protection modes
- Atomizer resistance range 0.05 to 5 Ohms, total
- Atomizer resistance 0.2-3.5 Ohms (40W), 0.4-1.7 Ohms (80W)
- Reverse battery protection
- Versatile menu structure
- Individual user preferences selection
- spring loaded center pin
- 2Year warranty on electronic

03 Display Operation

The MOD is equipped with a graphical OLED display which provides all important informations about the status for 4 seconds after each vape.

Temperature controlled mode:
Temperature at the end of vape
Other modes: battery symbol

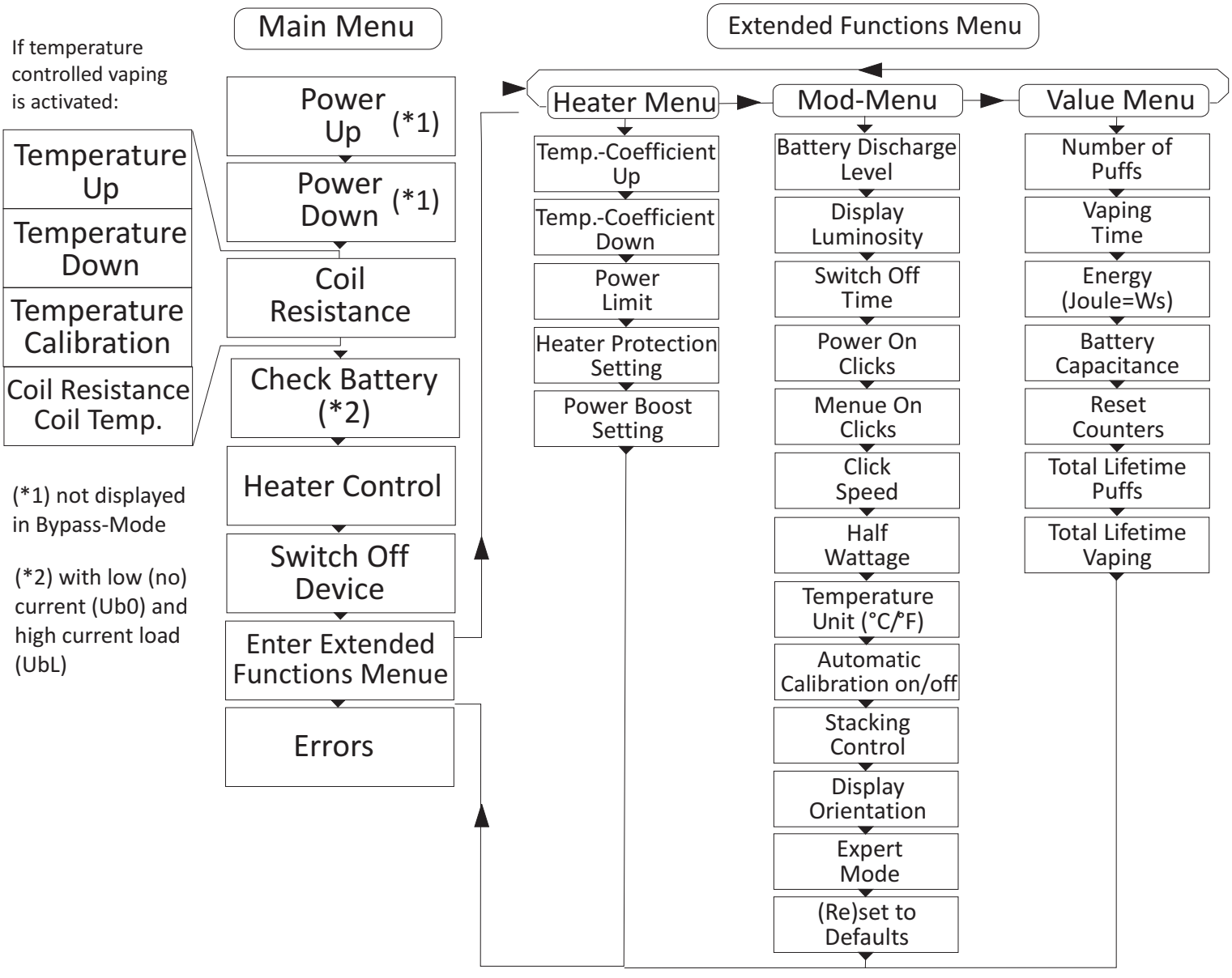


Battery-voltage at the end of the vape, including voltage drop during vape.

Wattage setting
In Direct-Mode (Bypass) it shows the actual power applied to the coil.

Coil-Resistance at end of vape, including temperature dependent increase.

04 Menu Overview



05 Main Menu (Page 1)

Power Up and *Power Down*

Power Up increases the power to the Power-Limit value and then rolls over to 5W. Power Down decreases the power down to 5W and then rolls over to the Power-Lim value. The Power-Limit value is adjusted in the Extended Functions Sub-Menu “Heater” and provides a protection feature for atomizers which are not prepared for high wattage or to reduce the power range intentionally. The wattage step size is 1 Watt below 20, 2W up to 40W and 5W above 40W , but can be set to 0.5W, 1W and 2.5W respectively in the mod-menu with “Half Watt=1”.
With temperature controlled vaping activated, the power setting is the power limit for the temperature regulator. If the power level is smaller than the value needed to achieve the selected temperature, the operation changes from a temperature regulator to a temperature limiter. If the power level is sufficiently high, it sets the heating up speed of the coil until the set-point temperature is reached.
In the operation mode “Bypass” (mechanical mod), the power setting is not available, because the power is defined by the battery voltage and coil resistance. The menu items “Power Up/Down” are not displayed in this case.

Temperature Up and Temperature Down

This Menu items are ***only available and displayed if temperature controlled vaping is selected*** (see Heater-Control menu item below). So the menu structure adapts to the selected operation mode. The Temperature Up/Down menu sets the setpoint for the coil temperature during vaping. The temperature setpoint can be selected from 120°C to 280°C (250°F- 540°F) in steps of 5°C (10°F). To achieve a high precision temperature control, a correctly performed reference measurement (TempCal Init) is mandatory, see next item.

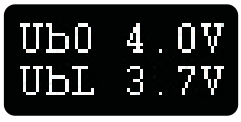
Manual Coil Temperature Calibration

This Menu item is ***only displayed if temperature controlled vaping is selected*** (see Heater Control menu item below). The Temperature calibration measures the coil resistance at room temperature (20°C) as the reference for temperature controlled vaping. The calibration must be confirmed in a second step to avoid accidential activation.
The dicodes mods with temperature control are adjustable to perform the calibration manually or automatically, with the manual option always available. With the automatic calibration enabled, the reference measurement is performed after each switching on of the mod immediately before the first puff, or - with an already switched on mod - when the atomizer is replaced. To get additional information on this, please read the “application note for temperature controlled vaping”.
To get a high precision it is important for the atomizer and coil to have cooled down to room termperature. Otherwise the temperature display and control will have an offset. If, for example, the calibration is done at 40°C coil temperature with a set-point of 220°C, the actual temperature will be regulated to 240°C instead of 220°C.
Also take the ambient temperature during the temperature setting into account .

Coil Resistance and Coil Temperature

This is a display only menu item. The coil resistance is displayed in a range from 0.00 to 9.90 Ohms. If temperature controlled vaping is selected, the current measured coil temperature is also displayed, if not, the display shows T ---.
If the display does not show 20°C even with colled down atomizer, it is recommeded to perform a manual calibration.

05 Main Menu (Page 2)



Battery Status

The Check Battery item shows the battery voltage with little current drained (Ub0) and the battery voltage under load during the last puff (UbL). The difference is the voltage drop of the battery. A high drop (>0.4V) indicates a poor battery or contact problems.

Please note that every battery has an inner resistance and that therefore the voltage at its contacts always drops when current is drained. The more current is drained, the higher the drop will be. Always remember this behaviour.

Commonly used batteries of 18650 size have inner resistances of about 15mOhm up to 80mOhm. Smaller sized batteries even have higher resistances. Generally speaking, the batteries with high capacity have higher inner resistance (e.g. 2500mAh NCR has 75mOhm) and those with lower capacity also have lower inner resistance (e.g. 2100mAh Sony Konion has 15mOhm).

Heater Control (Operation modes)

The mod can be used in up to 5 operation modes. The mode can be selected in this menu. The default operation is either standard (0, power setting) or temperature controlled vaping (1). With the “Expert Mode” (Extended Functions Mod-Menu) enabled, additional operation modes are Heater Protection (2), Power Boost (3), and Bypass (4, mechanical mod). With Expert Mode disabled, the menu options 2..4 are masked out.

0. Standard Mode

In the standard operation mode the wattage selected in the power setting menu is applied to the coil, unless the voltage would be greater than 12V or the current greater than 15A, which depends on the coil resistance.

For example with a coil resistance of 4 Ohms and a power setting of 40W, the required voltage at the coil is 12.7V. With 4 Ohms the maximum wattage is 36W ($(12V)^2/4R=36W$). Or, if the coil resistance is 0.1 Ohm the maximum power is 22.5W, because $(15A)^2*0.1Ohm=22.5W$.

As can be seen from the examples, with high coil resistance the power is limited by the maximum voltage of 12V and with low resistances by the maximum current of 15A. The fact is also reflected in the feature list: A power of 80W is guaranteed from 0.4 to 1.7 Ohms. Resistances of 0.05 to 5 Ohms are possible but with a reduced power.

1. Temperature controlled vaping

In this mode the mod will regulate the temperature of the coil to the pre-set value, except the power setting is too low to achieve the temperature. So please note to adjust the power setting to a value high enough, if you choose temperature controlled vaping. Otherwise the temperature regulation changes to a temperature limitation mode.

2. Heater Protection Mode

The heater protection mode is a periodic interruption of the power applied to the coil. The duration and the repetition rate of the interrupts is selected by means of the parameter “Heater Prot” in the extended functions mod-menu. The repeated power interrupt helps to avoid a break in liquid flow and thus an increase in temperature.

05 Main Menu (Page 3)

Extended Functions
Heater Menü

The table below shows the relation between power interrupt and appliance time in dependence of the parameter “Heater Prot”:

Value Heater Prot	On-Time [ms]	Off-Time [ms]	Powerfactor
1	400	100	0.80
2	600	100	0.86
3	800	110	0.88
4	1000	120	0.89
5	1350	150	0.90
6	2000	200	0.91
7	2000	180	0.92
8	2000	150	0.93
9	2000	100	0.95
10	2000	80	0.96

Main Menu

Parameter

3. Power Boost Mode

The Power Boost Mode enables an initial short term high power pulse applied to the coil (boost). The boost power is the value of the parameter “Power Limit”.
Beside 3 selectable initial boost lengths, further options generate a periodic boost pulse with different length and repetition rate.
An initial boost is for quick coil heat-up. The periodic boost lets the coil temperature pass a certain range all the time. In this case different flavours within the liquid, which all develop their taste at different temperatures, are all addressed by the varying temperature.
We recommend to set the normal power (not the boost) to much lower values, when using the periodic boost, because the average power is increased by the boosts and temperature gets higher therefore.

Extended Functions
Heater Menu

Wert Power Boost	Boostzeit [ms]	Zeit auf Nennleistung [ms]	Effektive Leistung (bei 5W Nennleistung)
1	300	-	Start-Boost
2	450	-	Start-Boost
3	600	-	Start-Boost
4	50	500	6.18
5	80	600	6.53
6	120	700	6.9
7	160	800	7.17
8	200	900	7.36
9	250	1000	7.6
10	300	1000	8.0

Note: If the power setting equals the power limit value, the boost has no function, as it is limited to that value as well.
For a graphical diagram showing the boost operation options, please refer to the document “Explanations refering to the Power Boost on dicodes mods” or have a look to the manual of model Tiny.

05 Main Menu (Page 4)

Switch Off Device

Beside the Auto-Power-Off feature, the user can actively switch off the device. It is recommended to switch the device off or to wait for auto-power-off, before the battery is replaced, because then the statistic counters (see below) are saved. Otherwise the changes since the last power up are lost.

To switch off the device wait on this menu item until the display of the 0 is inverted, the press the button.

Extended Functions Menu

The Extended Functions Menu provides three logically grouped sub-menues:

Heater Menu ➡ Settings related to the heater or coil
Mod Menu ➡ Settings related to the individual usage and appearance
Value Menu ➡ Provides several statistics of vaping

The Extended Functions Menu offers a lot of setting options of the mod, to provide the highest possible flexibility for the user to individually adjust it to whatever preferences. Normally, once the settings were made, the user will need to change the parameter rarely. In order to keep the main menu as short as possible, the extended functions menu was created.
The many options may frighten some of the users initially. But without the extended functions menu the mod would not be able to address all different customer requirements. Please take a bit of time to get familiar with the menu. We are sure, as soon as you have gained an overview, the individual setup is a walk-over.

Error Messages

If an error occurs, the mod directly jumps to the error menu and displays the error number and a mnemonic (short-term) description.
The possible error messages are:

0 OvrVolt: The input voltage is too high. The dicodes 2380 is prepared for the use of one or two batteries. If one battery is selected in the stack mode menu (value=1) in the extended functions mod-menu, and the input voltage exceeds 4.5V, this error message is displayed. With two batteries selected (value=2), the error occurs for an input voltage >8.6V.Reduce the input voltage to the specified range. With stack mode set to 0 (automatic detection) the error is dsplayed for voltages >8.6V.

1 ChkAtom: No atomizer detected or open coil.

2 TempRef: A problem during the temperature reference measurement occured

3 HighR: The resistance of the coil is too high for the selected output power. The maximum output voltage is 12V and current is 15A. This specification together with a maximum output power of 80W leads to a resistance range of 0.4-1.7 Ohms. Also see “8 LowR”. Higher and lower resistances are possible, but the power has to be reduced accordingly.
Example 1: With a 4Ohm coil the maximum power is $(12V)^2/4$ Ohm=36W.
Example 2: With a 0.12Ohm coil the maximum power is $(15A)^2$*0.12 Ohm= 27W.
Note: To achieve the selected power, the maximum of 12V and 15A limit the usable resistance range.

4 OverCur: Short on coil or coil breakdown (open)

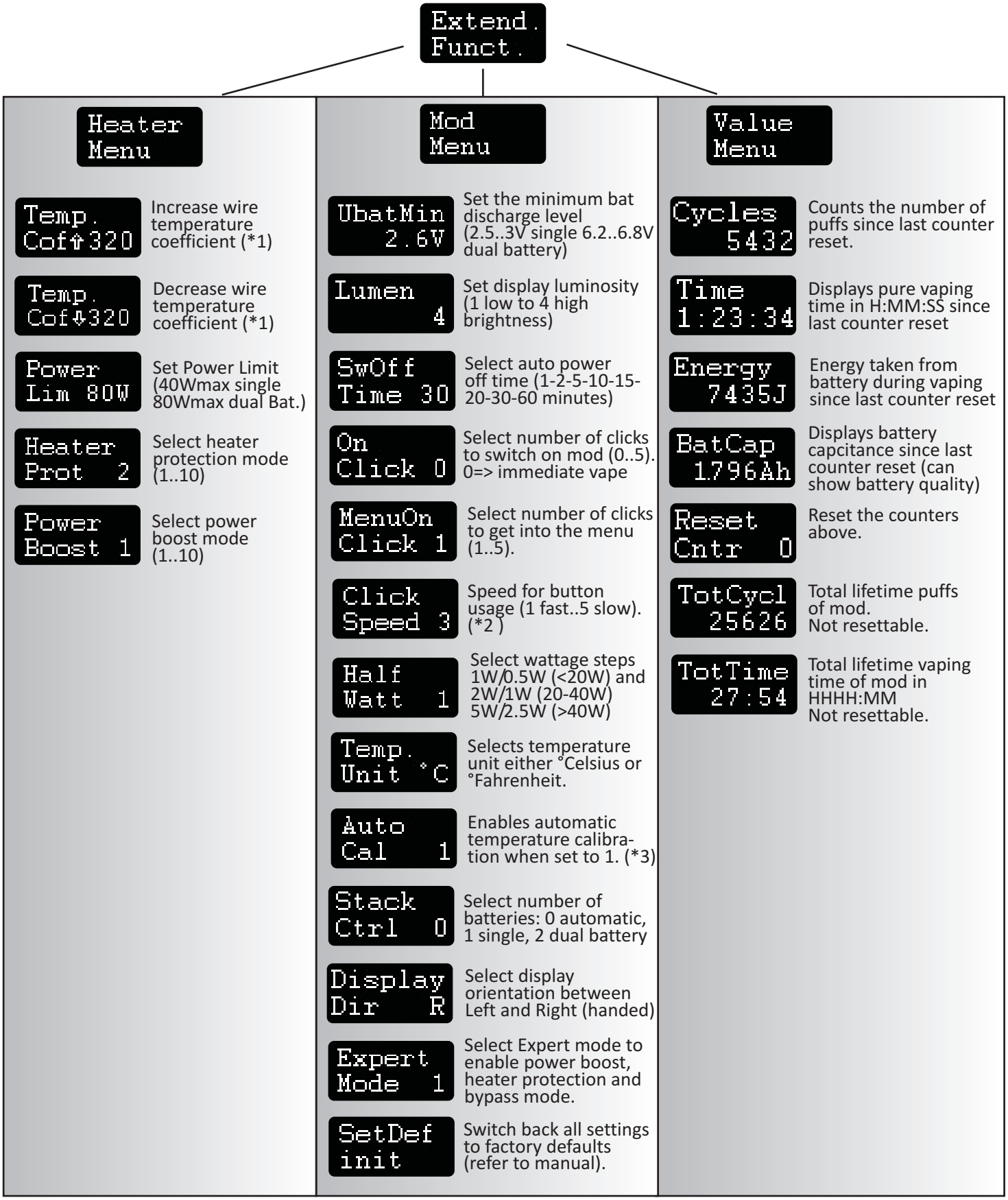
5 LowBat: The battery voltage under load (with current drained from it) has reached the minimum discharge level, defined with parameter UbatMin in the extended function mod-menu. The Ubatmin range depends o nthe number of batteries used.

6 EleHot: The electronics have heated up too much and needs to cool down. This error will not occur with normal usage of the mod.

7 TimeOut: The maximum puff-time is limited depending on power. For a power <20W it is 20seconds. Above 20W it decreases by 0.5seconds per Watt, down to 10seconds. Above 40W it stays at 10 seconds.

8 LowR: The coil resistance is too low for the selected power, please see “3 HighR”.

06 Extended Functions Menu (Page 1: Overview)



(*1) The temperature coefficient selects the type of wire material, range 100 to 650: 320=dicodes-wire, 620=Nickel, about 105=Stainless Steel, 350=Titanium (varying literature values, danger: fire harzard), 480=Tungsten (Wolfram). Value to select = Literature-value*10E5 K. Example: Ni 6.2E-3*1/K * 10E5*K => 620

(*2) Setting 1 (fastest) as 2 but without animation (visual shift effect), setting 5 (slowest) as 4, but without fast auto-repeat.

(*3) Autocalibration is performed, when MOD is switched on, or when atomizer was removed and new atomizer is applied (when MOD is already on).

06 Extended Functions Menu

Additional Explanation to several menu items, page 1

In the following paragraphs, explanations are given for those parameters and items, which are not self explanatory or which have inter-dependencies with other parameters or functions.

The selection of the correct wire-temperature-coefficient is very important for the correct operation of the mod, when temperature controlled vaping is selected.
Note that the coefficient of stainless steel can vary a lot, depending on the alloy composition, the manufacturer and production lot. For Titanium the literature value also varies significantly.
The TempCof item in the menu is present, even if the operation mode is not selected to temperature controlled vaping.

The Power Limit has an effect on several functions of the mod:
- Power Limit defines the adjustment range of the power in the main menu. As stated in the main menu already, the limit value sets the roll-over point of the menu items “Power Up” und “Power Down”. The power limitation makes sense especially in the standard vaping mode and the use of small atomizers or coils, to avoid a coil break.
- Power Limit sets the power during the boost-phase in the Power Boost Mode.

All dicodes devices have a functionality to adjust the minimum discharge level of the battery between 2.5V and 3.0V (single battery, older models up to 3.5V). On the 2380 and the use of two batteries, the discharge level can be set between 6.2 to 6.8V. Almost all available batteries on the market specify the minmum discharge level of 2.5V to 2.7V. For two batteries care must be taken , because theoretically one battery could be discharged to 2.5V, whereas the other still could have 4.2V. As the voltage of a fully charged battery quickly drops to 3.7V, the discharge level for two batteries is set to minumum 6.2V. If the user is unsure, whether her/his specific battery meets this specification, the level should be set to 2.7V or 6.4V respectively.
The selected voltage is the voltage at the poles of the battery when current is drained from it (the current drained depends on the power at the coil). In contrast to other available tube- and box-mods on the market, which stop operation already at 3.4V (or 7.0V) the lower discharge level on dicodes mods lead to a better battery utilization (about 20%).

The time to automatic power off of the mod can be selected between 1 minute up to 60 minutes. We recommend to choose 2 or 5 minutes in conjunction with immediate vaping enabled (”OnClick”=0). This is the best utilization of the battery. In this combination, though, there is one situation to be considered: If the mod is transported in a bag, e.g., and the button is accidentially pressed all the time, it theoretically could happen that the mod exceeds the maximum vape time, error 7, goes into auto power off, is immediatle switched on again and so forth in an endless loop.
To overcome this potential problem, the mod has an implemented secure behaviour: If “OnClicks”<2 **AND** Error 7 (TimeOut) happened **AND** the mod has an auto-power-off, the mod can only be switched on again by pressing the button short term 5 times. This behaviour happens only one time. Afterwards the operation is as selected by the user. The 5 OnClicks is also activated, when “Onclick”<2 **AND** the devices is actively switched off by the user (not auto-power-off).
As indicated, the OnClick range is from 0 (immediate vape) to 5. Note that the mod is always on after the first click, and then detects whether the selected number of clicks is performed in a certain time. If this is not the case, it switches off immediately.

06 Extended Functions Menu

Additional Explanation to several menu items, page 2

For the use of temperature controlled vaping, the calibration measurement is a very important part of it. The calibration measurement is neccessary to tell the mod, what the coil resistance is at ambient temperature (20°C). With this information and in combination with the wire material's temperature coefficient, the mod can measure the coil's temperature by measuring its resistance.
It is extremely important to understand, that, if the calibration is performed at a temperature other than 20°C, the control will regulate a constant temperature, but with an offset deviation. Similiar, if a wrong temperatuer coefficient was adjusted, the actual temperature might deviate dramatically from the set-point (here it is a factor and not an offset).
The user should consider this, if another atomizer is attached, even when the coil is made from the same material. In the main menu the item Calibr Temp should be initiated. There is an additional confirmation step added to avoid an accidental calibration measurement. After the second step "Confirm" the calibration is done showing "process" in the mod display.

The Extreme V2 also offers the option to activate an automatic calibration. To enable automatic calibration this menu item needs to be set to 1. The automatic calibration is always performed when the mod is switched on and just before the first puff, or if the mod is already on, when the atomizer is changed. If OnClick is set to 0 for immediate vaping, the calibration delays the puff by about 0.1 second.

The 2380 can work with one or two batteries. With the stack control the user can select an automatic detection (0) of the numbers of batteries, or deliberately set one or two batteries. Settings 1 or 2 add a safety margin for the system, because if the user accidentially combines two discharged batteries both at 2.2V,, the total voltage is in the range of 4.4V, which is within the permitted range for one battery. Disacharging the batteries further will destroy them.

The Dani Extreme V2 can be used in 5 different modes. But in order to keep the menu as short and simple as possible, 3 of the 5 modes are only available, if the Expert-Mode is set to 1. The name is Expert-Mode, because the use of the additional operation modes requires additional knowledge about their functionality.

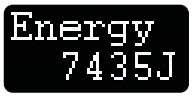
Here again the modes in an overview:

- Standard: Vaping with a constant power setting. The selected power is applied to the coil, unless the coil's resistance affords a different power setting.
- Temperature Control: The power applied to the coil is calculated by a temperature controller which keeps the coil's temperature constant. Important to note: Set the right temperature coefficient and perform a calibration at room temp.
- Power Boost: The coil is quickly heated up initially. Moreover an repetitive boost can be selected. Note to not to set the power limit to a value too low and use lower normal power setting.
- Heater Protection: The power to the coil is repetively interrupted to enable a liquid flow und to limit the temperature.
- Bypass: The mod behaves like a mechanical mod, i.e. the battery voltage is directly applied to the coil. This with the restriction, that the maximum current is limited 15A. Note that the vape now depends on the charging level of the battery, and the coil should not be very low in resistance as then 15A is reached soon.

06 Extended Functions Menu

Additional Explanation to several menu items, page 3

The Extended Functions Menu has another sub-menu showing several statistical values. Ther are two types of value-counters, either re-settable to zero or not.
The statistic counters are saved whenever the mod is automatically or manually switched off. In contrast, if the battery is removed from the mod before switching off, the changes of the counters since the last switching on are lost.



The following statistical values are stored:

- Cycles Number of puffs. The counter can be reset to 0.
- Time The timespan during which power was applied to the coil, i.e. vaping time. The counter can be reset to 0.
- Energy This is the energy consumption during vape in Joules=Watt-Seconds. This value is the true integrated vape power over time. It is the power integral, because during temperature controled vaping (and also in bypass mode) the power is not constant, but varies a lot over time due to the regulation. The counter can be reset to 0.
- BatCap This is a quite interesting counter: If it is reset imemdiately after the insertion of a fully charged battery, and checked before a new battery is inserted, it shows the batteries capacity. With this function the user can check, whether the battery has a capacity as declared by the manufacturer or whether the battery is wear-out. This counter can be reset to 0. With stacked batteries used, the value shows the average capacity of the two.
- TotCycl "Total Cycles" is the number of puffs throughout the entire mod's life. It cannot be reset.
- TotTime "Total Time" is the total time of vaping (not stand by) in a format HHHH:MM that is 4digits of hours and 2 for minutes. It cannot be reset.

The menu item **Reset Cntr**, i.e the resetting of the counters, is intentionally positioned between resettable counters and those which cannot be reset. So it is easier to remember, which are reset.

Remark about stacking: The efficiency of the system, that is battery and mod, is higher when using two batteries instead of one. In other words the total vape time of a stacked-batteries mod is somewhat longer than two times the vape time of a single-battery mod. This is because the currents at the same power output is half for two batteries compared to one. Example: A current drained from the battery of 10A, with an inner resistance of 70mOhms generates a power loss of 7W during vape. A current of 5A from two batteries (both 70mOhm) generates a power loss of just 3.5W distributed to two batteries! Moreover the voltage drop which increases the current needed for the same output power is half.

There is often the request for a recommendation regarding types of batteries.
Without claiming completeness nor undue preference of a manufacturer we can recommend:

Samsung INR18650 25R
LG ICR18650 Hd2
Sony Konion US18650UTC4

07 Remarks and Notes

Battery
Always use batteries with high drain current or very high current capability (even with lower cpacitance, except power is below 20W). Avoid to use no-name products. Insert the battery with the plus terminal in the direction towards the atomizer and in angular position.

Electronic cigarettes
Electronic cigarettes are NOT healthy. But so far all studies indicate, that they are less harmful compared to tobacco- cigarettes.
Electronic cigarettes are an alternative to tobacco-products, but should not be regarded as an dehabituation to smoking.
Electronic cigarettes are not suited for children and youngster below 18years of age, non-smokers, pregnant women, persons with allergies against Nicotine, Propylene Glycol and persons with cardiovascular disease.
Selling to persons below 18years of age prohibited!

Battery Disposal
You bought a rechargable battery powered product. The rechargable battery lasts long, but wears out nevertheless. Li-Ion batteries may not be disposed in houshold waste. Customers are obligated by law to dispose wear out batteries to apporiate gathering points.

Mod Disposal
The symbol below indicates that this product should not be treated as house-hold waste, but according to WEEE (waste electrical/electronical equipment) should be reused or recycled.

dicodes GmbH
Friedrich der Große 70
DE-44628 Herne
Germany
Phone: +49 2323 1463635
Email: info@dicodes.de