



VAL-4Si

**8(4+4)-Channel
Simultaneous Quick Charger**

INSTRUCTION MANUAL

ENGLISH·····Pages 2-16

JAPANESE·····Pages 17-31



I·D·X Company Limited

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IDX Technology thanks you for choosing the VAL-4Si and is sure that you will benefit from its unique features.

Please utilize this instruction manual to best maximize and safely use your VAL-4Si, 8(4+4) Channel Simultaneous Quick Charger. If you have any additional questions, please contact the appropriate IDX office or visit our website <http://www.idx.tv>

General Notes and Safety

- Do not attempt to open or modify this unit. All work should be carried out by IDX authorised service personnel only.
- Use only with compatible batteries listed in this manual. Charging non-compatible batteries may cause fire, electrical shock or other incidents.
- When connecting a battery be sure to insert the battery into the battery socket or connector firmly.
- When in use do not place anything on the charger and do not block ventilation holes. Use in a well ventilated area.
- Do not expose to, use or place the unit in direct sunlight, extreme dust, water or other hazardous environments.
- During charging the temperature of the charger will rise, this is normal and not a malfunction.
- A short between the plus (+) and minus (-) charge pins may cause fire, electrical shock or other incidents. Make sure that the charge connector does not touch any metal parts when a battery is not connected.
- Stop charging immediately if the charging does not complete within the designated time. In case of abnormal smell, leak, colour change or case deformity during use turn the power off and unplug the cable from the socket to avoid possible injury.
- Only use the AC cable included with the charger or ones specified. If fused confirm the fuse rating capacity before use.
- For continued protection replace any fuses with specified type and rating.
- This unit contains no user serviceable parts.
- In case of fault or service, please contact your IDX dealer or appropriate IDX office.

Features

- Multi-chemistry charger for all IDX Li-Ion, Ni-MH and Ni-CD batteries.
- Can charge up to 8 batteries on 4 simultaneous quick charging channels.
 - 8 ENDURA System batteries can be connected at once using the optional C-VAL2E Charge Cabel.
 - NP type batteries can be charged via optional A-E2NP Charge Adaptor.
- Optimum charger for high battery usage, fast and powerful charge capabilities.
- Auto safety & protection features for damaged or misused batteries.
- Robust lightweight polycarbonate case, recessed power switch, built-in AC line spare fuse, convenient carrying handle.
- Universal AC power input for worldwide use.
- LED and LCD display panel gives you status of charger and batteries.
- With "Battery Management System (BMS)" software, the VAL-4Si can be connected to a PC to provide various batteries information to help you manage your batteries.

Specifications

- **Input Voltage** : AC100~240V 50/60Hz Automatic
- **Power Consumption** : 310VA max
- **Quick Charge Current** : 2.3A (Li-Ion) *When all 4 Ch's are charging
3.0A (Li-Ion) *When up to 3 Ch's are charging
1.9A (Ni-Cd / Ni-MH)
- **Quick Charge System** : Li-Ion Constant Current / Constant Voltage
Ni-CD Constant Current
Ni-MH Constant Current
- **Full Charge Detection System** : Li-Ion Current Control Detect
Ni-CD Minus Delta V Detect System
Ni-MH dT/dt Detect System
- **Pre Charge Current** : Approx. 360mA
- **Charge Protection Timer** : Li-Ion Pre-Charge 120 min
Quick Charge 520 min
Ni-CD Pre-Charge 90 min
Quick Charge 240 min
Ni-MH Pre-Charge 90 min
Quick Charge 420 min
- **Operating Temperature** : -10°C ~ 40°C
- **Dimensions** : Approx. 160(W) × 200(H) × 288(D) mm /
Approx. 6.3(W) × 7.9(H) × 11.4(D) inches
- **Weight** : Approx. 4.4 kg / Approx. 9.63 lbs

Compatible Batteries

- All IDX ENDURA System Li-Ion batteries *1
- All IDX NP-Type Li-Ion & Ni-Cd batteries *2
- All IDX BP-Type Ni-Cd & Ni-MH batteries

*1. The Charge Cable C-VAL2E is necessary in order to charge ENDURA batteries on BP charge mount.

*2. NP Type batteries charged via optional A-E2NP Charge Adaptor.

Safety Features

The VAL-4Si has built in safety features to protect the charger and batteries from serious damage in the event of an attempt is made to charge a faulty battery. Low voltage batteries are detected prior to applying a quick charge current. If a battery is found to have a low voltage, it will not be quick charged until it reaches the acceptable quick charge level. This prevents any damage to the unit or to the battery. Batteries reaching an over voltage condition during the charge process will also be detected and charging will be stopped automatically.

〈Battery "Low Voltage" Protection〉

If a battery is detected to have "low voltage" the pre-charge mode automatically starts (Indicated by a Solid Red LED), quick charging will only commence once the battery has reached the required minimum voltage.

Li-Ion (12V) Ni-CD (10.5V) Ni-MH (11V)

If a battery fails to reach the required minimum voltage within a set time, all charging will be stopped and "Battery Fault" displayed. (Indicated by a Flashing Amber LED)

Li-Ion (120min) Ni-CD (90 min) Ni-MH (90 min)

〈Over-Charge Protection〉

If a battery fails to reach "Full Charge" within a set time period of the quick charge starting, charging will automatically be stopped and "Battery Fault" displayed.

(Indicated by a Flashing Amber LED)

Li-Ion (520min) Ni-CD (240min) Ni-MH (420min)

〈Over-Charging "Voltage" Protection〉

If during the charge process a battery exceeds its charge-voltage limit, charging is automatically stopped and "Battery Fault" displayed.

(Indicated by a Flashing Amber LED)

Li-Ion (17.5V) Ni-CD & Ni-MH (21.5V)

Operating Instructions

- ① Connect AC power cord firmly. (If required, use USB cable and connect to a P.C to retrieve BMS data)
- ② Turn the front mounted POWER Switch ON. (Power LED and LCD Display will light)
- ③ Connect a battery: Battery Check Mode starts, the charge channel LED will display solid Red while the charger is checking the battery.

Battery Check: After 5 seconds the LED will remain Red indicating that the VAL-4Si is operating in quick charge mode, if a battery has a fault the LED will flash Amber. If a battery cannot initially enter quick charge a recovery program will start, during which time the LED will also remain solid Red. When the battery has successfully recovered, the VAL-4Si will automatically charge to a quick charge program. If a battery cannot be recovered or is detected to be over-charged, the LED will flash Amber indicating a battery fault.

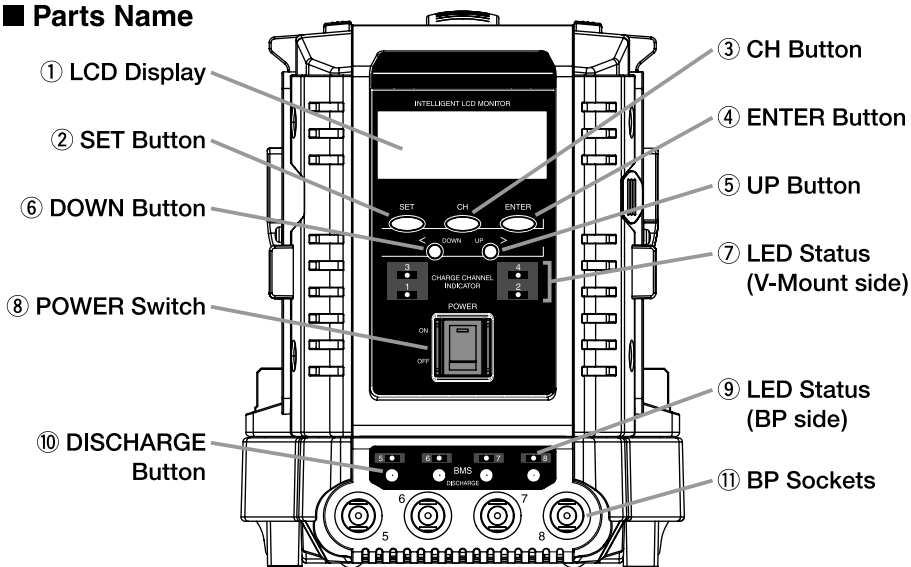
The VAL-4Si can operate as an 8 channel charger using the 4 main V-Mount charge channels on the side of the charger and a further 4 via the 4 connectors on the base unit (Via optional C-VAL2E Charge Adaptor). The 4 main channels correspond with the 4 base channels using the following pairings (1 & 5) (2 & 6) (3 & 7) (4 & 8).

If batteries are connected to a pair of channels e.g. 1 & 5, whichever channel was connected first will have charge priority over the corresponding channel, when the priority battery registers full charge, charging is automatically transferred to the battery in the corresponding channel. However if the charger is switched off, priority will automatically be given to batteries connected to the main V-Mount channels when the unit is switched back on.

- ④ When a battery has been fully charged the charge channel LED will automatically change to solid Green, indicating that the battery is ready for use.
- ⑤ To start Normal Discharge press the corresponding Red DISCHARGE Button. If you wish to discharge all 8 channels first press all DISCHARGE Buttons, once discharging has started press the Red DISCHARGE Buttons a second time, channels 5~8 will then start discharging automatically when their corresponding 1~4 channels have reached their end voltages.
- ⑥ How to set discharge (Normal / BMS Mode) . The VAL-4Si can be set to Normal or BMS Discharge Mode, if the unit is in "Normal Mode" and a DISCHARGE Button is pressed the unit defaults to a Normal Discharge, if a BMS Discharge is required while the unit is set to "Normal Mode" follow the instructions below.
For Normal Discharge press the corresponding Red DISCHARGE Button.
For BMS Discharge recording in "Normal Mode" from channels 1~4 press corresponding DISCHARGE Button and the SET Button together, for channels 5~8 press the corresponding DISCHARGE Button and ENTER Button together to start BMS Recording.
When the unit is set to "BMS Discharge Mode" BMS Discharge recording will start automatically by pressing the corresponding Red DISCHARGE Button.
Note: When using the "BMS Discharge Mode" a battery will be automatically charged after discharge.
- ⑦ To remove a battery from the charger, while holding either of the Release Buttons located on top and side of each channel, slide the battery upwards.

Identification

Parts Name



Function

- ① **LCD Display** : The LCD has three modes, [B-Mode] displays battery information, [C-Mode] displays charger information and [S-Mode] displays set up functions.
- ② **SET Button** : Together with the CH Button it is used to switch between S-Mode pages and previously displayed pages (B-Mode or C-Mode).
- ③ **CH Button** : Together with the SET Button it is used to switch between S-Mode pages and previously displayed pages (B-Mode or C-Mode). Together with ENTER Button it is used to switch between B-Mode and C-Mode.
- ④ **ENTER Button** : Together with CH Button it is used to switch between B-Mode and C-Mode.
- ⑤•⑥ **UP & DOWN Button** : Scrolls between pages in each Mode.
- ⑦•⑨ **LED Status** : Displays status of charging / Discharge status of battery using three colours.
- ⑧ **POWER Switch** : Turns power on / off. (When unit is on the POWER Switch LED will show solid Amber)
- ⑩ **DISCHARGE Button** : These buttons are used to start discharging batteries. Each DISCHARGE Button operates the following channels. (Button 1: CH1 and CH5, Button 2: CH2 and CH6, Button 3: CH3 and CH7, Button 4: CH4 and CH8)
* Detailed operating instructions can be found in the Set Up page section (S Mode 5~7)
- ⑪ **BP Sockets** : For charging & discharging ENDURA batteries (using C-VAL2E Charge Cable) or 3 Pin type BP batteries.

LED Colour Status

- Light Off : No Battery Connected
- Solid Red : Battery Check / Quick Charge / Battery Recovery in progress
- Solid Green : Charge Complete
- Flashing Amber : Battery Fault
- Flashing Red : Charger Fault
- Flashing Green : Discharging
- Flashing Red and Green : BMS Recording

How to Operate LCD Display

■ LCD Display Mode

The LCD Display has three modes

B Mode [B1] ~ [B7] Battery related information

C Mode [C1] ~ [C5] Charger related information

S Mode [S1] ~ [S7] Set up functions

■ How to Change LCD Display and Pages

Pressing CH and SET Buttons together, selects **S Mode** [S1] ~ [S7].

Pressing them again reverts back to the previous page.

Pressing CH and ENTER Buttons together, switches between **B Mode** [B1] ~ [B7] and **C Mode** [C1] ~ [C5]

■ B Mode : Battery Pages (B1 ~ B7)

Operation To scroll between pages, use the UP & DOWN Buttons

UP Button: scroll pages up

DOWN Button: scroll pages down

「 B1 」 : Status of Each Battery Channel (2 pages)

1 ▶ Charging	B1
2 ▶ Discharging	
3 ▶ None	
4 ▶ Charge Done	

5 ▶ Discharging	B1
6 ▶ Wait Discharge	
7 ▶ Discharge 	
8 ▶ Wait Charge 	

Charging : Charging in operation

Charging Done : Charge Complete

Error # : Error Code No.

None : No Battery

Charging : Charging in operation

Discharging : Battery Discharging

Wait Discharging : Wait for Discharging

Wait Charge : Wait for Charging

Wait Discharge : Wait for BMS

Discharging

Wait Charge : Wait for BMS

Charge

Discharging : BMS Discharging

in operation

「 B2 」 : Battery Charge Status in % (Li-Ion Battery Only)

Different Displays by Battery Type :

- E-10, E-7, E-80, E-50.....

Shows battery charge status from 0% to 100% in 1% steps.*

- E-10S, E-80S.....

Shows 「 <80% 」 when 80% or less.

Shows from 81% -100% in 1% steps when the charge status is above 80%

- E-7S, E-50S.....

Shows 「 <70% 」 when 70% or less. Shows from 71% -100% in 1% steps when the charge status is above 70%

- Other batteries..... Shows 「 --- 」

* Note: For E-50, Serial No. F015001 and earlier are non-digital batteries, therefore, it will display the same as E-50S ~ 「 <70% 」

Note: **During Discharge** : The remaining capacity figure will start to flash and the value decrease. When the discharge has finished, charging will start automatically, and the charge status will be displayed.

- E-10S, E-80S, E-7S, E-50S.....

During Discharge: When the discharge has finished, the display shows 0%, when charging starts the charge status is shown.

STATUS	B2
3 ▶ 100%	<80% ◀ 4
1 ▶ <80%	90% ◀ 2

[B3] : Battery Charge Status in Watt Hours (Wh's) (2 pages)

CAPACITY		B3
3 ▶ 85Wh	63Wh	◀ 4
1 ▶ 75Wh	90Wh	◀ 2

CAPACITY		B3
7 ▶ 85Wh	98Wh	◀ 8
5 ▶ 75Wh	76Wh	◀ 6

Different Displays by Battery Type :

- E-10, E-7, E-80, E-50 Displays Wh from 0Wh in 1Wh steps*
- Other batteries Displays 「---」

* Note: For E-50, Serial No. F015001 and earlier are non-digital batteries, therefore, display shows 「---」 only.

Display During Discharge :

The capacity figure on the LCD display starts to flash and the value shown will decrease. When the discharge has finished, charging will start automatically, and the charge status will be displayed. During Discharge the LCD display shows 0Wh when charging starts it will show Wh and increase in 1Wh increments.

[B4] : Voltage and Current Readings During Charge (2 pages)

1 ▶ 16.78V	0.00A
2 ▶ 14.00V	2.16A
3 ▶ 13.90V	2.18A
4 ▶ 16.79V	0.00A

5 ▶ 16.78V	0.00A
6 ▶ 14.00V	▼ 2.16A
7 ▶ 13.90V	▼ 2.18A
8 ▶ 16.79V	0.00A

Note: During Discharge: The display shows the higher discharge current with the ▼ mark, and the voltage will decrease.

[B5] : Number of Charge Cycles (E-10, E-7, E-80, E-50 Only)

CYCLES		B5
3 ▶ 35	16	◀ 4
1 ▶ 56	---	◀ 2

- Other non-digital Li-Ion battery Shows 「---」

* Serial No. A306201 and earlier of E-80 and Serial No. F015001 and earlier of E-50 are non-digital type. Displays shows 「---」 only.

「 B6 」 : Remaining Charge Time Estimate (Li-Ion Battery Only)

CHG	TIME	LEFT	B6
3 ▶	2:21	1:30	◀ 4
1 ▶	---	1:30	◀ 2

* 「---」 Will be shown when it is discharged.

Different Displays by Battery Type :

- E-10, E-7, E-80, E-50
Remaining charge time in minutes to reach full charge.
- Other Li-Ion batteries
Shows 「---」 for Li-Ion, non-digital batteries, until constant voltage charge status is reached, the remaining time is displayed in minutes.

「 B7 」 : Full Battery Information on Single Page

(Digital battery internal IC recorded information available only on CH1-CH8.)

CH1	G024258	B7
16.79V		0.85A
62Wh	99%	0:43
Ver 6.1		12C

Line 1 : Battery Serial No.
(E-10, E-7, E-80, E-50 Only)*
Line 2 : Charge Voltage / Current
Line 3 : Charge Capacity (Wh & %),
remaining charge time to full charge
Line 4 : Battery Version No. / No. of Cycles

- Other non-digital Li-Ion batteries Shos 「---」
(Including Serial No. F015001 and earlier of E-50)

* Serial No. A306201 and earlier of E-80 are non-digital type, therefore, Cycle No. shows 「---」 only.

■ C Mode : Charger Pages (C1 ~ C5)

Use the UP & DOWN Buttons to scroll between pages.

「 C1 」 : Number of Charge Units on Each Channel (2 pages)

Displays the number of charge units the particular charger channel has been used to charge a battery. (1 X charge unit is counted when a battery has been subjected to a charge of 30 minutes or more.)

Charge Units	C1
3 ▶ 2	6 ◀ 4
1 ▶ 8	5 ◀ 2

Charge Units	C1
7 ▶ 5	3 ◀ 8
5 ▶ 9	6 ◀ 6

[C2] : Displays Charge Version Information

Displays the chargers Serial No. / Program Version / Revision No. and Date of Program Install.

IDX	A303030	C2
VAL-4Si	V0.15	
Rev.	05-05110	
Mdate	2005/07/07	

Line 1 : Serial No.
 Line 2 : Version No.
 Line 3 : Revision No.
 Line 4 : Date of Program Install

[C3] : Error Code (2 pages)

When the LED status indicators flashes Red or Amber to warn of a fault, the LCD display will support this by displaying an error code to help identify and solve problems. (The full Error code list is on page 16.)

1 ▶ Error # 07	C3
2 ▶ Normal	
3 ▶ Normal	
4 ▶ Normal	

5 ▶ Normal	C3
6 ▶ Normal	
7 ▶ Normal	
8 ▶ Error # 09	

[C4] : Power Supply Unit (PSU) Voltage

Displays the actual DC voltage. Records the minimum voltage of Power Supply to aid fault finding and service.

P · S · U	Voltage	C4
Real	24.4V	
Min	24.4V	

Real·····Current Voltage
 Min·····Display the lowest voltage of Power supply if faulty.

* When output error (minimum output voltage value) is detected, normal display cannot be retrieved by resetting the minimum output voltage value on the charger display. Please contact your IDX dealer or appropriate IDX office for resetting.

[C5] : VAL-4Si Discharge Counter (2 pages)

(1 X discharge unit is counted when a battery is discharged for 30 mins or longer)

Discharge Unit	C5
3 ▶ 2	6 ◀ 4
1 ▶ 2	5 ◀ 2

Discharge Unit	C5
7 ▶ 2	6 ◀ 8
5 ▶ 8	5 ◀ 6

■ S Mode : Set Up Pages (S1 ~ S7)

Use the UP & DOWN Buttons to scroll between pages.

「 S1 」 : Setting Up a User Default Page

Any page can be set up as your preferred own default or favorite page. This default page is displayed as the first screen whenever POWER Switch is turned on.

SET - UP	S1
Selection of favorite page B2	

How to Set the Default Page : For example, if you wish set page B2 as the default page.

- ① From the S1 page, push the CH Button. The current default page will flash.
- ② Scroll pages using UP & DOWN Buttons, and when the required page [B2 in this example] is flashing, push ENTER Button to set up your default page [B2]

「 S2 」 : Change the Charging Voltage

From this page, you can change the charging voltage for Li-Ion batteries, channel by channel.

SET - UP	S2
Charge Voltage	
3 ▶ 16.8V	16.8V ◀ 4
1 ▶ 16.4V	16.4V ◀ 2

* Voltage setting range : 16.4V ~ 16.8V

* Please contact your nearest IDX office to discuss the relative benefits and decision process in changing the charge voltage

How to Operate :

- ① From the S2 page push the CH Button and select a channel. When you push CH Button, voltage figures start flashing from ALL to Ch1, Ch2, Ch3 to Ch4.
- ② After choosing a channel or ALL, use the UP & DOWN Buttons to select the required voltage.
- ③ When the chosen voltage is reached, press the ENTER Button to set.
Remark : When [ALL] is flashing, all channel charging voltages are changed.

「 S3 」 : Channel ID

The channel ID is designed for use with the BMS function.

SET - UP	S3
Channel ID	
999 - 3	999 - 4
999 - 1	999 - 2

* To change Channel ID, refer to the BMS software operation manual.

* Setting of Channel ID can be done via PC & installed BMS software.

Note: The charger does not have a direct setting function.

[S4] : Factory Reset (2 pages)

Various parameters that can be changed through the "User Pages" can be reset to the factory setting.

SET - UP	S4
Rset to Factory setting	
Yes	

S4 First Page

SET - UP	S4
Confiem	
Yes	No

S4 Second Page

How to Operate :

- ① From the first page of S4, push CH Button.
- ② When the second page is displayed, select Yes / No using UP or DOWN Buttons
Yes : Reset to Factory setting = Push SET Button.
No : Return to the first page of S4 = Push ENTER Button.

[S5] : Setting up BMS Discharge Load Value (2 pages)

SET - UP	S5
Discharge load	
3 ▶ 30W 15W ◀ 4	
1 ▶ 30W 45W ◀ 2	

SET - UP	S5
Discharge load	
7 ▶ 25W 15W ◀ 8	
5 ▶ 30W 25W ◀ 6	

How to Operate :

- ① Select Page S5, press the CH Button and all channels and their wattage figures will flash.
- ② Select required channel or ALL then use the UP & DOWN Buttons to select required wattage, to confirm the setting press ENTER.

Note: When [ALL] is flashing and the wattage is changed and enter is pressed the chosen wattage will be set on all channels.

- In BMS Discharge Mode channels are paired, CH1 and CH3, CH2 and CH4, CH5 and CH7, CH6 and CH8.
 - Please note that there is a maximum discharge wattage per pairing: For example, when CH1 and CH3 batteries are discharged simultaneously in BMS Mode, the total wattage of both channels should not exceed 60W. If the total wattage of a pairing exceeds 60W the battery connected first will have discharge priority and the second battery will be held in a waiting mode until the first reaches the cut off voltage, at this point the second battery will begin discharging automatically.
- ③ If the total wattage of each pairing is less than 60W, both channels will discharge simultaneously.
 - ④ Using the BMS Discharge Mode, the wattage of each discharge channel can be set within the range of 15W~45W in 1W increments.

[S6] : Setting the End Voltage Value in BMS Discharge Mode (2 pages)

* Voltage setting range : 10.0V ~ 14.0V

SET - UP	S6
Lower Limit Volt	
3 ▶ 12.0V	12.0V ◀ 4
1 ▶ 12.0V	12.0V ◀ 2

SET - UP	S6
Lower Limit Volt	
7 ▶ 12.0V	12.0V ◀ 8
5 ▶ 12.0V	12.0V ◀ 6

How to Operate ;

- ① Select Page S6, press the CH Button and all channels and their Voltage figures will flash.
- ② Select required channel or ALL then use the UP & DOWN Buttons to select required End Voltage, to confirm the setting press ENTER.
Note: When [ALL] is flashing and the voltage value is changed and enter is pressed the chosen voltage will be set on all channels.
- ③ Using the BMS Discharge Mode, the End Voltage of each discharge channel can be set within the range of 10.0V ~ 14.0V, in 0.1V increments

[S7] : Setting up Discharge Mode Default (2 pages)

Using page S7 the discharge default mode can be set to Normal or BMS Mode.

SET - UP	S7
Discharge button	
<NORMAL>	
(Onry Discharge)	

SET - UP	S7
Discharge button	
<BMS>	
(Auto start BMS)	

How to Operate ;

- ① Select page S7, push the CH Button and [Normal] will start to flash, use the UP & DOWN Buttons to choose between NORMAL & BMS, then use the ENTER Button to confirm your required mode.

Notes: If discharging in Normal Mode the discharge load is set at 30W and the End Voltage at (12V Li-Ion) (10.5V Ni-Cd) (11.V Ni-MH) start flashing.

* Push ENTER Button to change a page from S Mode page to other mode pages.

Error Code List

VAL-4Si / VL-4Si

ERROR NO.	ERROR	ERROR DETAIL
1	Li-Ion batteries : exceeds pre-charge time limit	Battery Pack does not reach the correct voltage within the pre-charge time limit
2	Li-Ion batteries : incorrect pre-charge current value	Pre-charge current is incorrect (too low or too high)
3	Li-Ion batteries : exceeds charge voltage	Charge voltage exceeds the 17.5V limit for Li-Ion batteries
4	Li-Ion batteries : over-discharged	Battery is over-discharged (during pre-charge a cell was detected with a voltage below 1.5v) and cannot be charged
5	Li-Ion batteries : exceeds quick charge time limit	The quick charge time limit has been exceeded
6	Li-Ion batteries : quick charge current too low	The quick charge current is detected below the minimum level of 15V
7	Li-Ion batteries : exceeds charge voltage	Charge voltage exceeds the 17.5V limit for Li-Ion batteries
8	Ni-CD and N-MH batteries : exceeds pre-charge time limit	Battery Pack does not reach the correct voltage within the pre-charge time limit
9	Ni-CD and Ni-MH batteries : incorrect pre-charge current value	Pre-charge current is incorrect (too low or too high)
10	Ni-CD and Ni-MH batteries : exceeds charge voltage	Charge voltage exceeds 21V during quick charge
11		
12		
13	Ni-CD and Ni-MH batteries : incorrect quick charge current value	Quick charge current is incorrect
14	Ni-CD and Ni-MH Batteries : high temperature detected	Charging stopped as battery pack temperature exceeds 60°C
15	Incorrect Power supply voltage	PSU is supplying incorrect voltage (too low)
61	High temperature on Heat Sink (CH 1 & 3)	Heat Sink temperature exceeds 100°C (CH 1 & 3)
62	Temperature sensor fault (CH 1 & 3)	Thermistor is open (CH 1 & 3)
63	High temperature on Heat Sink (CH 2 & 4)	Heat Sink temperature exceeds 100°C (CH 2 & 4)
64	Temperature sensor fault (CH 2 & 4)	Thermistor is open (CH 2 & 4)
65	Discharge current exceeds the highest limit (VM, CH1)	AC / DC converted current exceeds 300mA
66	Discharge current exceeds the highest limit (VM, CH2)	AC / DC converted current exceeds 300mA
67	Discharge current exceeds the highest limit (VM, CH3)	AC / DC converted current exceeds 300mA
68	Discharge current exceeds the highest limit (VM, CH4)	AC / DC converted current exceeds 300mA
69	Discharge current below the lowest limit (VM, CH1)	AC / DC converted current has dropped below 300mA
70	Discharge current below the lowest limit (VM, CH2)	AC / DC converted current has dropped below 300mA
71	Discharge current below the lowest limit (VM, CH3)	AC / DC converted current has dropped below 300mA
72	Discharge current below the lowest limit (VM, CH4)	AC / DC converted current has dropped below 300mA
73	Discharge current exceeds the highest limit (BP, CH5)	AC / DC converted current exceeds 300mA
74	Discharge current exceeds the highest limit (BP, CH6)	AC / DC converted current exceeds 300mA
75	Discharge current exceeds the highest limit (BP, CH7)	AC / DC converted current exceeds 300mA
76	Discharge current exceeds the highest limit (BP, CH8)	AC / DC converted current exceeds 300mA
77	Discharge current below the lowest limit (BP, CH5)	AC / DC converted current has dropped below 300mA
78	Discharge current below the lowest limit (BP, CH6)	AC / DC converted current has dropped below 300mA
79	Discharge current below the lowest limit (BP, CH7)	AC / DC converted current has dropped below 300mA
80	Discharge current below the lowest limit (BP, CH8)	AC / DC converted current has dropped below 300mA
81~98	Allocated to the system	Allocated to the system
99	P12 LINE FIX LOW	JP1



<http://www.idx.tv>



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