

IMPORTANT SAFETY WARNING
READ MANUAL in its entirety before use.

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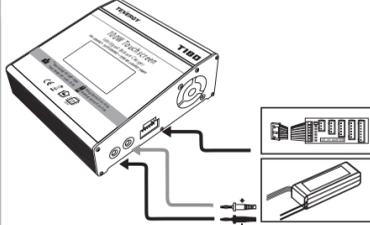
INSTRUCTION MANUAL

Technical Specifications

Input Voltage	DC 11~18V AC 100~240V
Charge Current	0.1~10.0A
Discharge Current	0.1~5.0A
Charge Power	max. 100W
Dischge Power	max. 20W
Balance current	max. 350mA
Balance tolerance	±0.01V
Charging Capability	NiMH/NiCd 1~16 cells LiPo/LiFe/Li-ion 1~6 cells
Pb battery voltage	2~20V
Discharge	LiPo/LiFe/Li-ion 2.0~4.2V/cell
Weight	1.61 lb
Dimensions	5.51 x 5.91 x 2.20 Inches

Connection

Connection diagram in the balance charging/storage/discharge mode

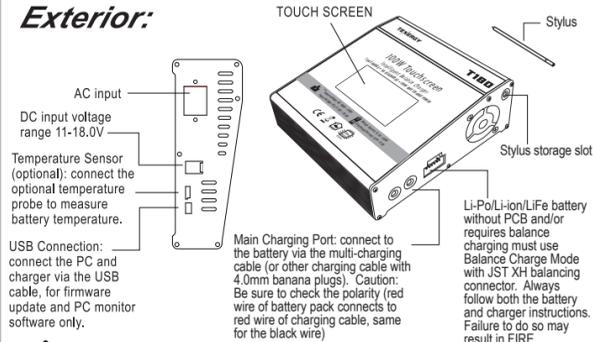


WARNING: Read the ENTIRE instruction manual to become familiar with the features of the product before operating.

WARNING: Never leave charger unattended, exceed maximum charge rate, charge with non-approved batteries or charge batteries in the wrong mode. Failure to comply may result in excessive heat, fire and serious injury.

CAUTION: Always ensure the battery you are charging meets the specifications of this charger and that the charger setting sare correct. Not doing so can result in excessive heat and other related product malfunctions, which can lead to user injury or property damage.

Exterior:

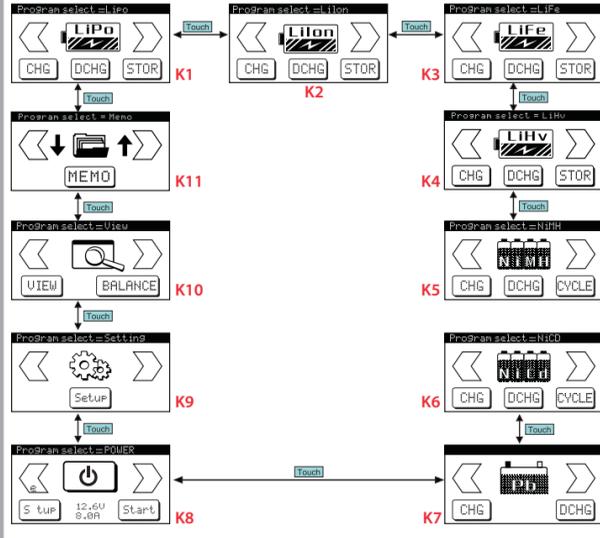


CAUTION: Always power on the charger before connecting a battery to the charger, or damage to the charger and the battery can result.

1. Connect charger to power source.
2. Connect balance board to charger (for LiXX batteries)
3. Connect a battery to charger's Main Charging Port using Multi-Charging Cable
4. Connect the battery's balance connector to the charger using the included balance board (for LiXX batteries only)
5. Select the desired program/function mode
6. Choose the desired program setting, and start the program

Menu Navigation

After power on the charger, the main menu will appear. Touching the left and right arrow keys to access various function screens as follows.



- K1. LiPo Battery Program
- K2. Li-ion Battery Program
- K3. LiFe Battery Program
- K4. LiHV Battery Program
- K5. NiMH Battery Program
- K6. NiCd Battery Program
- K7. Pb Battery Program
- K8. Digital Power Mode
- K9. Setup Mode
- K10. Battery Status/Balance Mode
- K11. Memory Mode

Lithium-based Battery Program

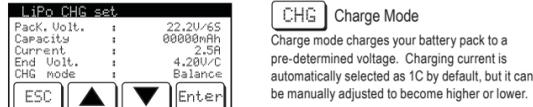
This charger can accept 4 types of Lithium-based batteries: LiPo, Li-ion, LiFe (LiFePO4), and LiHV.

Warning:
- Check your battery carefully to identify its type in order to choose the correct program. Selecting the wrong program can damage your battery and/or result in explosion/fire!
- Only choose the LiHV program if your battery is specifically labeled as such. Using LiHV to charge standard LiPo will overcharge your battery and can lead to explosion/fire.

Each LiXX program has the 3 operating modes. Selecting each mode will take you to its setting screen.



- CHG Charge Mode
- DCHG Discharge Mode
- STOR Storage Mode



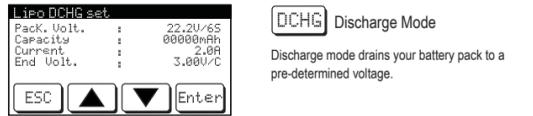
- CHG Charge Mode

WARNING: Li-Po/Li-ion/LiFe battery without PCB and/or requires balance charging must use Balance Charge Mode with JST XH balancing connector. Always follow both the battery and charger instructions. Failure to do so may result in FIRE.

Return to main menu: Highlight the field to customize, and change the value of selected field.
Touch briefly to select a field or to save the changes made to it; press and hold for 2 seconds to begin the program

Available settings:

Setting Name	Setting Descriptions	Option
Pack. Volt.	Input the nominal voltage of the battery pack, based on # of cell in series	1-6S
Capacity	Input the Capacity of the battery to be charged	50-50000mAh, in 50mAh increments
Current	Charging Current	0.1 to 10A in 0.1A increments
End Volt.	Termination Voltage	3.8V - 4.3V (LiPo) 3.8V - 4.2V (Li-ion) 3.3V - 3.8V (LiFe) 3.85V - 4.4V (LiHV)
CHG Mode	Select between standard charging (without balancing), and balance charging	Balance / No -Balance

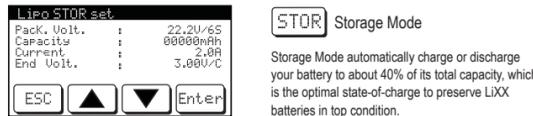


- DCHG Discharge Mode

Discharge mode drains your battery pack to a pre-determined voltage.

Available settings:

Setting Name	Setting Descriptions	Option
Pack. Volt.	Input the nominal voltage of the battery pack, based on # of cell in series	1-6S
Capacity	Input the Capacity of the battery to be charged	50-50000mAh, in 50mAh increments
Current	Discharging Current	0.1 to 5A in 0.1A increments
End Volt.	Termination Voltage	3.0V - 4.2V (LiPo) 3.0V - 4.1V (Li-ion) 2.0V - 3.6V (LiFe) 3.15V - 4.35V (LiHV)



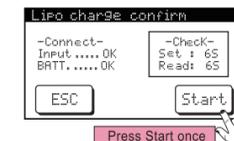
- STOR Storage Mode

Storage Mode automatically charge or discharge your battery to about 40% of its total capacity, which is the optimal state-of-charge to preserve LiXX batteries in top condition.

Available settings:

Setting Name	Setting Descriptions	Option
Pack. Volt.	Input the nominal voltage of the battery pack, based on # of cell in series	1-6S
Capacity	Input the Capacity of the battery to be charged	50-50000mAh, in 50mAh increments
Current	Charging Current	0.1 to 5A in 0.1A increments
End Volt.	Termination Voltage	3.7V - 4.2V (LiPo) 3.6V - 4.1V (Li-ion) 3.3V - 3.6V (LiFe) 3.85V - 4.35V (LiHV)

*Changing the End Voltage in Storage Mode would also increase/decrease the end capacity level accordingly. Please keep the default setting unchanged if the 40% state-of-charge for storage is desired.



Confirmation Screen

A confirmation screen appears when you press and hold the START button in the previous screen. It tells you if the physical connection between the charger and your battery is valid. If an error is detected, an error screen will appear. If no problem is detected, you can either press "START" again to begin the program, or touch "ESC" to cancel.

Program selected and elapsed time

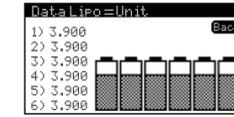


Operation Screen

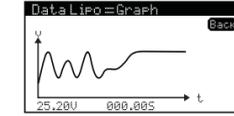
The Operation Screen shows you details of the battery and the current program that is running.

LiXX Operation Screen Info

Operation	Name	Descriptions
Discharge, Charge, Balance	Capacity	Capacity that's been charged into or discharged from the battery pack so far
	Current	Charging / Discharging Current
	Voltage	Battery Voltage
	Stage	For LiXX batteries: CC (constant current) or CV (constant voltage)
	Input Volt	DC Input Voltage, either from the charger's internal power supply or its DC Input port
	End Volt	Target battery voltage to achieve
	Int Temp.	Internal temperature of the charger
Charge, Balance, Storage	Safety Timer	Safety Timer Duration (After which the charger will turn off automatically)
	CAPA Cut-off	Capacity Cut-off Threshold (Beyond which the charger will turn off automatically)
	Resistance	Internal resistance of the battery
	Peak Temp.	Highest temperature detected during the program (requires the optional temperature sensor accessory)
	CHG Power	Charging Power (= Charging voltage multiplied by charging current)
Discharge, Storage	DCHG Power	Discharging Power (= Battery voltage multiplied by discharging current)



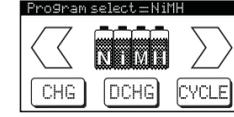
Unit Screen
(For cell voltage display)



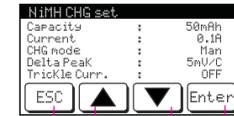
Graph Screen
(For voltage curve display)

NiMH/NiCd Battery Program

Each NiXX program has the 3 operating modes. Selecting each mode will take you to its setting screen.



- CHG Charge Mode
- DCHG Discharge Mode
- CYCLE Cycle Mode



- CHG Charge Mode

Charge mode charges your battery pack to a pre-determined voltage. Charging current is automatically selected as 1C by default, but it can be manually adjusted to become higher or lower.

Return to main menu: Highlight the field to customize, and change the value of selected field.
Touch briefly to select a field or to save the changes made to it; press and hold for 2 seconds to begin the program

Available settings:

Setting Name	Setting Descriptions	Option
Capacity	Input the Capacity of the battery to be charged	50-50000mAh, in 50mAh increments
Current	Charging Current	0.1 to 10A in 0.1A increments
CHG Mode	This setting changes the Delta Peak used (see below): Manual: select your own Delta Peak Auto: use default Delta Peak setting of 8mV/Cell for NiMH and 5mV/Cell for NiCd	Man (Manual) / Auto
Delta Peak	Select the voltage drop that is used to determine when a battery is fully charged. When unsure, choose Auto CHG Mode, or consult the specs of your battery.	5-25mV/Cell
Trickle Curr.	If this is on, a small current will be used to continue charging the battery after it's been fully charged, to offset self-discharging.	Off, 50-200mA in 10mA increments



- DCHG Discharge Mode

Discharge mode drains your battery pack to a pre-determined voltage.

Available settings:

Setting Name	Setting Descriptions	Option
End Volt.	Termination Voltage Note: NiCd/NiMH batteries should not be discharged to less than 0.9V/Cell, except for old batteries that you are ready to dispose.	0.10V to 24.00V in 0.1V increments
Capacity	Input the Capacity of the battery to be charged	50-50000mAh, in 50mAh increments
Current	Discharging Current	0.1 to 5A in 0.1A increments



- CYCLE Discharge Mode

Cycle mode allows you to repeatedly charge/discharge your NiCd/NiMH batteries.

Available settings:

Setting Name	Setting Descriptions	Setting Range
Capacity	Input the Capacity of the battery to be charged	50-50000mAh, in 50mAh increments
CHG Curr.	Select the charge current	0.1A to 10.0A in 0.1A increments
DCHG Curr.	Select the discharge current	0.1A to 5.0A in 0.1A increments
DCHG End Volt.	Termination Voltage Note: NiCd/NiMH batteries should not be discharged to less than 0.9V/Cell, except for old batteries that you are ready to dispose.	0.10V to 24.00V in 0.1V increments
Cycle Mode	Select the cycle order: charging before discharging, or vice versa	CHG>DCHG, DCHG>CHG
No. of Cycle	Select how many cycles to run	1T to 5T
Delay Timer	Select the rest time between each charging and discharging cycle. This will allow the battery to cool down in the cycling process. We recommend using 10 mins for most situations.	1 min to 60 mins



Confirmation Screen

A confirmation screen appears when you press and hold the START button in the previous screen. It tells you if the connection between the charger and your battery is valid. If an error is detected, an error screen will appear. If no problem is detected, you can either press "START" again to begin the program, or touch "ESC" to cancel.

Program selected and elapsed time



Operation Screen

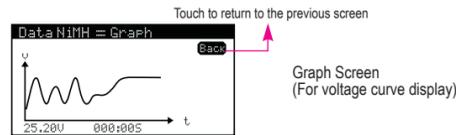
The Operation Screen shows you details of the battery and the current program that is running.

NiMH Operation Screen Info

Operation	Name	Descriptions
Discharge, Charge, Cycle	Capacity	Capacity that's been charged into or discharged from the battery pack so far
	Current	Charging / Discharging Current
	Voltage	Battery Voltage
Discharge, Charge, Cycle	Stage	CC (constant current) CV (constant voltage) Trickle (trickle charging)
	Input Volt	DC Input Voltage, either from the charger's internal power supply or its DC Input port
	Delta Peak	The voltage drop threshold used to determine when the battery is fully charged

NiMH/NiCd Program - Continued

Discharge, Charge, Cycle	Int Temp.	Internal temperature of the charger
	Safety Timer	Safety Timer Duration (After which the charger will turn off automatically)
	Resistance	Internal resistance of the battery
	Peak Temp.	Highest temperature detected during the program (requires the optional temperature sensor accessory)
Charge, Balance, Cycle	CHG Power	Charging Power (= Charging voltage multiplied by charging current)
Discharge, Cycle	DCHG Power	Discharging Power (= Battery voltage multiplied by discharging current)



Lead Acid Battery Program

The Pb battery program is used to charge lead acid batteries. It has the 2 operating modes: Charge and Discharge. Selecting each mode will take you to its setting screen.

Program select = Pb

CHG Charge Mode
DCHG Discharge Mode

Pb Charge Set.

CHG Charge Mode

Charge mode charges your battery pack to a pre-determined voltage. Charging current is automatically selected as 1C by default, but it can be manually adjusted to become higher or lower.

Return to main menu

Highlight the field to customize, and change the value of selected field

Touch briefly to select a field or to save the changes made to it; press and hold for 2 seconds to begin the program

Available settings:

Setting Name	Setting Descriptions	Option
Pack. Volt.	Rated voltage of the battery	2V - 24V
Capacity	Rated capacity of the battery	50-5000mAh, in 50mAh increments
Current	Charging Current. Pb/lead acid batteries are typically charged at low current, and the optimal charging current for is 0.1C (e.g. 0.1C for a 10Ah battery is 1A). When unsure, please follow the charging instructions from the battery manufacturer.	0.1A to 10.0A

Pb Discharge Set.

DCHG Discharge Mode

Discharge mode can be used to fully discharge your lead acid battery.

Press Enter >2S=Start

Available settings:

Setting Name	Setting Descriptions	Option
Pack Volt.	Rated voltage of the battery	2V - 24V
Capacity	Rated capacity of the battery	50-5000mAh, in 50mAh increments
Current	Discharging Current.	0.1A to 5.0A, in 0.1A increments

Program selected and elapsed time

Next page

Pb-6S CHG 000.00s

Capacity : 0000mAh
Current : 10.0A
Voltage : 25.00V
Resistance : No
Peak Temp. : No sens

STOP Graph

Operation Screen

The Operation Screen shows you details of the battery and the current program that is running.

Program and Battery Info

Stop the current program

Display the real time voltage curve (battery voltage vs time) for the current program

Pb Operation Screen Info

Operation	Name	Descriptions
Discharge, Charge	Capacity	Capacity that's been charged into or discharged from the battery pack so far
	Current	Charging / Discharging Current
	Voltage	Battery Voltage

Discharge, Charge	Stage	CC (constant current) CV (constant voltage) Trickle (trickle charging)
	Input Volt	DC Input Voltage, either from the charger's internal power supply or its DC Input port
	End Volt	The target battery voltage to achieve.
	Int Temp.	Internal temperature of the charger
	Safety Timer	Safety Timer Duration (After which the charger will turn off automatically)
Discharge, Charge	Resistance	Internal resistance of the battery
	Peak Temp.	Highest temperature detected during the program (requires the optional temperature sensor accessory)
Charge	CHG Power	Charging Power (= Charging voltage multiplied by charging current)
Discharge	DCHG Power	Discharging Power (= Battery voltage multiplied by discharging current)



Digital Power Program

This operation mode turns the charger into a DC power supply. Simply connect the charger to your device through its red/black Main Charging Port, and configure the power output from the charger's touch-screen control.

Program select = POWER

Touch the "Setup" button to configure the power output.

Configure the power output

Select Voltage / Current Output

Press and hold for 2 seconds to begin

36.0V 0.1A

POWER Setup set

Out Volt. : 22.2V
Current : 10.0A
Max. Power : 0000W

Digital Power Output Settings

Touch briefly to select a field or to save the changes made to it; press and hold for 2 seconds to begin the program

Return to main menu

Navigate to the desired field; change the value of selected field.

Available settings:

Setting Name	Setting Descriptions	Option
Out Volt.	Output DC Voltage	3.0V - 24.0V in 0.1V increments
Current	Output DC Current	0.1V - 10.0V in 0.1V increments
Max. Power	Maximum Power Output	1Watt - 90Watt in 1W increments

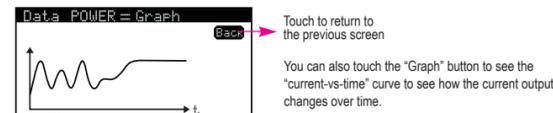
POWER Mode

Out Volt. : 22.2V
Current : 10.0A
Power : 0000W

The real-time output current & power

Once started, the voltage, current and total power output will be displayed.

STOP Graph



Data View

This program can be used to quickly check the battery and charger status (View), or to balance your LiXX batteries.

Program select = View

VIEW View Screen

BALANCE Balance Screen

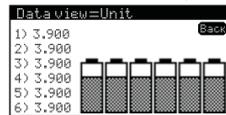
Data view

Input volt : 15.10V
Output volt : 0.030V
Int Temp : 34.0
Ext Temp : No sens
Resistanc : *****

ESC Unit

VIEW View Screen

Charge: input voltage, internal temperature
Battery (if connected): battery voltage (Output Volt.), battery temperature (Ext. Temp. requires temperature probe), internal resistance.



For LiXX batteries with balance connector, touching the "Unit" button will display the voltage of each individual cell.

--Battery Type--

LiPo LiIon LiFe

ESC START

BALANCE Balance Screen

To balance your LiXX, touch the icon that matches your battery type, then touch the "START" button.

Warning: Be sure to verify your battery's chemistry type in order to select the correct setting. Failure to do so can damage your battery.

Memory Program

The Memory Program allows you to save the settings of the charger's last operation, so you can load them up quickly in the future.

Program select = Memo

MEMO

Battery memory [1/4]

M01 NULL
M02 NULL
M03 NULL
M04 NULL
M05 NULL

ESC DEL LOAD SAVE

Next Page

To Save:

1. Touch one of the 20 available memory slots (M01 - M20). Empty slots are displayed as NULL
2. Touch the "SAVE" button, and the last-used operation settings will be saved in that slot.

To Load:

1. Touch one of the occupied memory slots.
2. Touch the "LOAD" button, and the operation settings in that slot will be loaded to the Setup screen for that program. Adjustments can still be made before starting the program.

To Delete:

1. Touch and hold one of the occupied memory slots for 1-2 seconds.
2. The slot label will return to NULL. Now it's available for use again.

ATTENTION!!

WARNING: Failure to exercise caution while using this product and comply with the following warnings could result in product malfunction, electrical issues, excessive heat, FIRE, and ultimately injury and property damage.

1. Never leave the power supply, charger and battery unattended during use.
 2. Never attempt to charge batteries that are dead, damaged, wet, non-rechargeable, or of chemistry types that is not specifically mentioned in this manual.
 3. Never attempt to charge a battery pack containing different types of batteries.
 4. Never allow children under 14 years of age to charge battery packs.
 5. Never charge a battery in extremely hot or cold places or place in direct sunlight.
 6. Never charge a battery if the cable has been pinched or shorted.
 7. Never connect the charger if the power cable has been pinched or shorted.
 8. Never connect the charger to an automobile 12V battery while the vehicle is running.
 9. Never attempt to dismantle the charger or use a damaged charger.
 10. Never connect the input jack(DC input) to AC power.
 11. Always use only rechargeable batteries designed for use with this type of charger.
 12. Always inspect the battery before charging.
 13. Always keep the battery away from any material that could be affected by heat.
 14. Always monitor the charging area and have a fire extinguisher available at all times.
 15. Always end the charging process if the battery becomes too hot to touch, or starts to change form (e.g. swelling/puffing) during the charging process.
 16. Always connect the charge cable to the charger first, then connect the battery to avoid short circuit between the charger leads. Reverse the sequence when disconnecting.
 17. Always connect the positive red leads(+) and negative black leads(-) correctly.
 18. Always disconnect the battery after charging, and let the charger cool between charges.
 19. Always charge in a well-ventilated area.
 20. Always terminate all processes and contact local dealer if the product malfunctions.
- WARNING: Never leave charger unattended, exceed maximum charge rate, charge with non-approved batteries or charge batteries in the wrong mode. Failure to comply may result in excessive heat, fire and serious injury.

CAUTION: Always ensure the battery you are charging meets the specifications of this charger, and that the charger's settings are supported by the battery. Not doing so can result in excessive heat and other related product malfunctions, causing user injury and/or property damage.

Warning & Error Messages

Tenergy's T180 Touch Screen Charger is designed to offer protection against various situations due to operating errors and hardware/battery malfunctions. Detected faults/errors are displayed on the LCD screen, halting any active process in order to protect the charger and the battery.

- [ERROR] REVERSE POLARITY (ESC) → Charger output is connected to a battery with incorrect polarity
- [ERROR] PROCESS INTERRUPTED (ESC) → Battery is not connected, or its connection is interrupted
- [ERROR] OUTPUT SHORT CIRCUIT (ESC) → Short circuit is present at the charger's output
- [ERROR] INPUT VOLTAGE ERROR (ESC) → Charger's DC power input is outside of the supported range of 11-18V
- [ERROR] CHARGER FAILURE (ESC) → Potential hardware failure
- [ERROR] BATTERY LOW VOLTAGE (ESC) → Battery voltage is too low for the chosen operation
- [ERROR] BATTERY HIGH VOLTAGE (ESC) → Battery voltage is too high for the chosen operation
- [ERROR] CELL LOW VOLTAGE (ESC) → Unit cell voltage too low
- [ERROR] CELL HIGH VOLTAGE (ESC) → Unit cell voltage too high
- [ERROR] CELL COUNT ERROR (ESC) → Balance port connection error
- [ERROR] CHARGER OVERHEATING (ESC) → The charger is overheating
- [ERROR] OVER POWER (ESC) → Output power exceeds the limit set in the digital power mode.
- [ERROR] MAX CURRENT (ESC) → Output current exceeds the limit set in the digital power mode.
- [ERROR] SAFETY TIMER (ESC) → Exceed the maximum safe time limit
- [ERROR] MAX CAPACITY (ESC) → Exceed the maximum capacity limit
- [ERROR] MAX EXT. TEMP (ESC) → The battery's external temperature is too high.

Regulatory Compliance

COMPLIANCE INFORMATION FOR THE EUROPEAN UNION

Declaration of Conformity



Product Name: T180 Touch Screen Balance Charger
Item Number: 03180 / TN180

The object of declaration described above is in conformity with the requirements of the specifications listed below, following the provisions of the European EMC Directive 2004/108/EC

EN 55014-1:2006
EN55014-2:1997+A1:2001
EN61000-3-2:2006
EN61000-3-3:2008

Instructions for disposal of WEEE by users in the European Union



This product must not be disposed of with other waste. Instead, it is the user's responsibility to dispose of their waste equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment.

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