Dealer's Manual



M8050 series

DEORE XT

RD-M8050 FD-M8070 SM-FD905 SW-M8050 SM-BTC1 BT-DN110 BT-DN110-A BM-DN100 SC-MT800

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IMPORTANT NOTICE

• This dealer's manual is intended primarily for use by professional bicycle mechanics.

Users who are not professionally trained for bicycle assembly should not attempt to install the components themselves using the dealer's manuals. If any part of the information on the manual is unclear to you, do not proceed with the installation. Instead, contact your place of purchase or a local bicycle dealer for their assistance.

- Make sure to read all instruction manuals included with the product.
- Do not disassemble or modify the product other than as stated in the information contained in this dealer's manual.
- All dealer's manuals and instruction manuals can be viewed on-line on our website (http://si.shimano.com).
- For consumers who do not have easy access to the internet, please contact a SHIMANO distributor or any of the SHIMANO offices to obtain a hardcopy of the User's Manual.
- Please observe the appropriate rules and regulations of the country, state or region in which you conduct your business as a dealer.
- The Bluetooth[®] word mark and logos are registered trademarks owned by the Bluetooth SIG, Inc. and any use of such marks by SHIMANO INC. is under license.

Other trademarks and trade names are those of their respective owners.

For safety, be sure to read this dealer's manual thoroughly before use, and follow it for correct use.

The following instructions must be observed at all times in order to prevent personal injury and physical damage to equipment and surroundings. The instructions are classified according to the degree of danger or damage which may occur if the product is used incorrectly.



Failure to follow the instructions will result in death or serious injury.



Failure to follow the instructions could result in death or serious injury.



Failure to follow the instructions could cause personal injury or physical damage to equipment and surroundings.

DANGER

Be sure to also inform users of the following:

Lithium ion battery

Be sure to observe the following instructions in order to avoid burns or other injury from fluid leakage, overheating, fire, or explosion.

- Use the designated charger to charge the battery. If any non-specified items are used, fire, overheating or leakage may occur.
- Do not heat the battery or throw it into fire. If this is not observed, fire or bursting may occur.
- Do not deform, modify, disassemble or apply solder directly to the battery. Do not leave the battery in places which may exceed 60 °C in temperature, such as places which are exposed to direct sunlight inside vehicles on hot days or near stoves. If this is not observed, leakages, overheating or bursting may cause fire, burns, or other injuries.
- Do not connect the (+) and (-) terminals with metallic objects. Do not carry or store the battery together with metallic objects such as necklaces or hairpins. If this is not observed, short-circuits, overheating, burns or other injury may occur.
- If any liquid leaking from the battery gets into the eyes, immediately wash the affected area with clean water without rubbing the eyes, and then seek medical attention.

Battery charger/Battery charger cord

Be sure to observe the following instructions in order to avoid burns or other injury from fluid leakage, overheating, fire, or explosion.

- Do not get the charger wet or use it while it is wet, and do not touch or hold it with wet hands. If this is not observed, problems with operation or electric shocks may occur.
- Do not cover the charger with cloths while it is in use. If this is not observed, heat may build up and the case may become deformed, or fire or overheating may occur.
- Do not disassemble or modify the charger. If this is not observed, electric shocks or injury may occur.
- Use the charger at the specified power supply voltage only. If a power supply voltage other than that specified is used, fire, explosions, smoke, overheating, electric shocks or burns may occur.
- Do not touch metallic parts of the charger or the AC adapter if there is a lighting storm. If lightning strikes, electric shocks may occur.

SM-BCR2: Battery charger for SM-BTR2/BT-DN110/BT-DN110-A

• Use an AC adapter with a USB port with a voltage of 5.0 V DC and with a current equal to or higher than 1.0 A DC. If the one with a current lower than 1.0 A is used, the AC adapter may heat up, potentially causing a fire, smoke, overheating, destruction, electric shock, or burns.

WARNING

• Be sure to follow the instructions provided in the manuals when installing the product.

It is recommended to use genuine Shimano parts only. If parts such as bolts and nuts become loose or damaged, the bicycle may suddenly fall over, which may cause serious injury.

In addition, if adjustments are not carried out correctly, problems may occur, and the bicycle may suddenly fall over, which may cause serious injury.

• Example Se sure to wear safety glasses or goggles to protect your eyes while performing maintenance tasks such as replacing parts.

• After reading the dealer's manual thoroughly, keep it in a safe place for later reference.

Be sure to also inform users of the following:

- Intervals between maintenance depend on the use and riding circumstances. Clean the chain with an appropriate chain cleaner regularly. Never use alkali based or acid based solvents, such as rust cleaners. If those solvents are used the chain might break and cause serious injury.
- When the shifting switch is operated, the powerful motor which drives the front or rear derailleur will operate to the shifting lever position without stopping, so be careful not to get your fingers caught.
- Check that the wheels are fastened securely before riding the bicycle. If the wheels are loose in any way, they may come off the bicycle and cause serious injury.
- Check the chain for any damage (deformation or crack), skipping, or other abnormalities such as unintended gear shifting. If any problems are found, consult a dealer or an agency. The chain may break, and you may fall.
- Be careful not to let the hemming of your clothes get caught in the chain while riding. Otherwise you may fall off the bicycle.

About the multi-shift function

- On this system, the multi-shift function can be configured using E-TUBE PROJECT. The gears will continue to shift when the shifting switch is pressed using the multi-shift function. Shifting speed setting for multi-shift can also be modified. When modifying the gear changing settings for multi-shift, carefully read "Settings customizable in E-TUBE PROJECT" in this dealer's manual.
- If crank revolutions are set to low under faster setting of the multi-shift shifting speed, the chain will be unable to follow the movement of the rear derailleur, possibly leading to issues such as the chain slipping over the tip of the cassette sprocket teeth, the cassette sprocket deforming, or the chain breaking.

ltem	Multi-shift speed	Characteristics	Usage notes	Crank rotation speed when operating multi-shift	
Very fast	High speed	 Quick multi-shifting is possible The crank rotation speed can be adjusted quickly depending on changes in riding conditions. The speed can be adjusted quickly. 	 Over-shifting occurs easily. If the rotation speed of the crank is low, the chain will be unable to follow the movement of the rear derailleur. The chain may therefore slip over the tip of the cassette sprocket teeth. 	High crank rotation speed	
Fast					
Normal	Default setting				
Slow					
Very slow	Low speed	Accurate multi-shifting is possible	Multi-shifting takes some time		

By default it is set to Normal.

Fully understand the features of the multi-shift speed, and choose a multi-shift gear shifting setting according to the riding conditions (terrain, riding method, etc.).

Lithium ion battery

- Do not place the battery into fresh water or sea water, and do not allow the battery terminals to get wet. If this is not observed, fire, bursting or overheating may occur.
- Do not use the battery if it has any noticeable scratches or other external damage. If this is not observed, bursting, overheating or problems with operation may occur.
- Do not throw or subject the battery to strong shock. If this is not observed, bursting, overheating or problems with operation may occur.
- Do not use the battery if leakages, discoloration, deformation or any other abnormalities occur. If this is not observed, bursting, overheating or problems with operation may occur.
- If any leaked fluid gets on your skin or clothes, wash it off immediately with clean water. The leaked fluid may damage your skin.
- The operating temperature ranges for the battery are given below. Do not use the battery in temperatures outside these ranges. If the battery is used or stored in temperatures which are outside these ranges, fire, injury or problems with operation may occur.
 1.During discharge: -10°C 50°C
 2.During charging: 0°C 45°C

SM-BTR1: Lithium ion battery

• If charging is not complete after 1.5 hours, stop charging. If this is not observed, fire, bursting or overheating may occur.

SM-BTR2/BT-DN110/BT-DN110-A: Lithium ion battery

• If the battery does not become fully charged after 4 hours, stop charging. If this is not observed, fire, bursting or overheating may occur.

Battery charger/Battery charger cord

SM-BCR1: Battery charger for SM-BTR1

- Hold the power plug when connecting or disconnecting the plug. Failure to do so may cause a fire or electric shock.
- If the following occurs, stop using the device and contact a dealer. A fire or electric shock may occur.
 - * If heat or acrid-smelling smoke is coming out from the power plug.
 - * There may be a bad connection inside the power plug.
- Do not overload the electrical outlet with appliances beyond its rated capacity, and use only a 100 240 V AC electrical outlet. If the electrical outlet is overloaded by connecting too many appliances using adapters, overheating resulting in fire may occur.
- Do not damage the power cord or power plug. (Do not damage, process, let near hot objects, bend, twist or pull them; do not place heavy objects on top or bundle them tightly.) If they are used while damaged, fire, electric shocks or short-circuits may occur.
- Do not use the charger with commercially-available electrical transformers designed for overseas use, as they may damage the charger.
- Always be sure to insert the power plug as far as it will go. If this is not observed, fire may occur.

SM-BCR2: Battery charger for SM-BTR2/BT-DN110/BT-DN110-A

- Do not use any USB cable other than the USB cable which is supplied with the PC linkage device. This may cause a charging error, fire, or failure to connect to PC due to overheating.
- Do not connect the charger to PC when it is on standby. This may cause a PC failure depending on its specifications.
- When connecting or disconnecting the USB cable or the charger, be sure to hold the cable by the plug. Failure to do so may cause a fire or electric shock.
- If the following occurs, stop using the device and contact a dealer. A fire or electric shock may occur.
 - * If heat or acrid-smelling smoke is coming out from the power plug.
 - * There may be a bad connection inside the power plug.
- If it thunders while charging with an AC adapter with a USB port, do not touch the device, bicycle, or the AC adapter. If lightning strikes, electric shocks may occur.
- Use an AC adapter with a USB port with a voltage of 5.0 V DC and with a current equal to or higher than 1.0 A DC. If the one with a current lower than 1.0 A DC is used, a charge error may occur or the AC adapter may heat up, leading to a fire.
- Do not use a USB hub when connecting the cable to a computer USB port. This may cause a charging error or fire due to overheating.
- Be careful not to damage the charging cable. (Do not damage, process, let near hot objects, bend, twist or pull them; do not place heavy objects on top or bundle them tightly.) If they are used while damaged, fire, electric shocks or short-circuits may occur.

Brake

- Each bicycle may handle slightly differently depending on the model. Therefore, be sure to learn the proper braking technique (including brake lever pressure and bicycle control characteristics) and operation of your bicycle. Improper use of your bicycle's brake system may result in a loss of control or a fall, which could lead to severe injury. For proper operation, consult a professional bicycle dealer or the bicycle's owner's manual. It is also important to practice riding and braking, etc.
- If the front brake is applied too strongly, the wheel may lock and the bicycle may fall forward, and serious injury may result.
- Always make sure that the front and rear brakes are working correctly before riding the bicycle.
- The required braking distance will be longer during wet weather. Reduce your speed and apply the brakes early and gently.
- If the road surface is wet, the tires will skid more easily. If the tires skid, you may fall off the bicycle; therefore, to avoid this, reduce your speed and apply the brakes early and gently.

Be sure to also inform users of the following:

Lithium ion battery

• Store the battery in a safe place away from the reach of infants and pets.

SM-BTR1: Lithium ion battery

• When you do not use the battery for a long period, remove and charge the battery before storage.

SM-BTR2/BT-DN110/BT-DN110-A: Lithium ion battery

• When you do not use the battery for a long period, charge the battery before storage.

Battery charger/Battery charger cord

SM-BCR2: Battery charger for SM-BTR2/BT-DN110/BT-DN110-A

• The charging cable cannot be removed.

NOTICE

Be sure to also inform users of the following:

- Be careful not to get water into the E-TUBE port.
- Be sure to attach dummy plugs to any unused E-TUBE ports. If water gets into any of the components, operating problems or rusting may result.
- Be sure to rotate the crank when carrying out switch operations which are related to gear shifting.
- Do not keep connecting and disconnecting the small waterproof connector. The waterproof section or the connecting section may become worn or deformed, and the function may be affected.
- The components are designed to be fully waterproofed to withstand wet weather riding conditions; however, do not deliberately place them into water.
- Do not clean the bicycle with a high-pressure wash. Moreover, do not place any components in water. If water gets into any of the components, operating problems or rusting may result.
- Handle the product carefully, and avoid subjecting it to any strong shocks. The internal battery may be damaged. If the product has been subjected to a shock, consult a dealer.
- Do not use thinners or similar substances to clean the products. Such substances may damage the surfaces.
- If gear shifting operations do not feel smooth, wash the derailleur and lubricate all moving parts.
- Contact the place of purchase for updates of the component software. The most up-to-date information is available on the Shimano website.
- Products are not guaranteed against natural wear and deterioration from normal use and aging.
- For maximum performance we highly recommend Shimano lubricants and maintenance products.

Lithium ion battery

- Lithium-ion batteries are recyclable, valuable resources. For information on used batteries, contact the place of purchase or a bicycle dealer.
- Charging can be carried out at any time regardless of the amount of charge remaining. Always be sure to use the special battery charger to charge the battery until it is fully recharged.
- The battery is not fully charged at the time of purchase. Before riding, be sure to fully charge the battery.
- If the battery has become completely empty, charge it as soon as possible. If you leave the battery without charging it, it will cause the battery to deteriorate.
- The battery is an exhaustible item. The battery will gradually lose its capacity to charging after repeated use. If the length of time that the battery can be used becomes extremely short, it has probably reached the end of its life, and so you will need to purchase a new battery.
- The life of the battery will vary depending on factors such as the storage method, the usage conditions, the surrounding environment and the characteristics of the individual battery pack.
- If storing the battery away for a long period, remove it when the battery level is 50% or higher or when the green indicator is illuminating in order to prolong its useful life; and it is recommended that you charge the battery about every six months.
- If the storage temperature is high, the performance of the battery is reduced, and its useable time will be shorter. When you use the battery after a long storage period, store the battery indoors where the battery will not be exposed to direct sunlight or rain.
- If the ambient temperature is low, the battery's usable time will be shorter.

SM-BTR1: Lithium ion battery

- When storing the battery away, remove the battery from the bicycle and install the terminal cover first.
- The charging time is approximately 1.5 hours. (Note that the actual time will vary depending on the remaining battery charge.)
- If the battery feels difficult to insert or remove, apply specified grease (premium grease) to the part that touches the O-ring at the side.

SM-BTR2/BT-DN110/BT-DN110-A: Lithium ion battery

- After removing the battery from the bicycle for storage, install a dummy plug.
- The charging time of an AC adapter with a USB port is about 1.5 hours, and that of computer USB port type about 3 hours. (Note that the actual time will vary depending on the amount of charge remaining in the battery. Depending on the specifications of the AC adapter, recharging via the AC adapter may require as much time (about 3 hours) as recharging via PC.)

Battery charger/Battery charger cord

- Use this instrument under the direction of a safety supervisor or the direction for use. Do not allow physically, sensory, or mentally impaired persons, inexperienced persons, or persons with no required knowledge, including children, to use this product.
- Do not allow children to play near the product.



- Charge the battery indoors to avoid exposure to rain or wind.
- Do not use outdoors or in environments with high humidity.
- Do not place the battery charger on dusty floors when using it.
- Place the battery charger on a stable surface such as a table when using it.
- Do not place any objects on top of the battery charger or its cable.
- Do not bundle the cables.
- Do not hold the battery charger by the cables when carrying it.
- Do not apply excessive tension to the cables.
- Do not wash the battery charger or wipe it using detergents.

SM-BCR2: Battery charger for SM-BTR2/BT-DN110/BT-DN110-A

- Connect the PC linkage device directly to a computer, without using an intermediate device such as a USB hub.
- Do not ride the bicycle while the PC linkage device and cable are still connected to it.
- Do not connect two or more of the same units to the same connection point. If this is not done, the units may not operate correctly.
- Do not connect or disconnect units again while unit recognition is in progress or after recognition is complete. If this is not done, the units may not operate correctly.
- Check the procedures which are given in the user's manual for the E-TUBE PROJECT when connecting and disconnecting units.
- The tightness of the PC link cable will tend to drop after repeated connections and disconnections. If this happens, replace the cable.
- Do not connect two or more PC linkage device at the same time. If two or more PC linkage device units are connected, they will not operate correctly. In addition, the PC may need to be restarted if operating errors occur.
- PC linkage devices cannot be used while the charger is connected.

Front derailleur

• Make sure that the plug cover is attached to the E-TUBE port when using the product.

Rear derailleur

- Be sure to check that the plate unit cover and cap are installed before riding the bicycle.
- Make sure that the plug cover is attached to the E-TUBE port when using the product.
- If gear shifting operations do not feel smooth, wash the derailleur and lubricate all moving parts.
- If the chain keeps skipping, ask the place of purchase to replace the chainrings, sprockets and/or the chain.
- If there is a large gap in the pulleys which causes a lot of noise, ask the place of purchase to replace the pulleys.
- The gears should be periodically washed with a neutral detergent. In addition, cleaning the chain with neutral detergent and lubricating it can be an effective way of extending the life of the gears and the chain.
- If the amount of looseness in the links is so great that adjustment is not possible, you should replace the derailleur.

For Installation to the Bicycle, and Maintenance:

- Be sure to attach dummy plugs to any unused E-TUBE ports.
- Be sure to use Shimano original tool (TL-EW02) to remove the electric wires.
- The motors of the motor unit cannot be repaired.
- Contact Shimano for information regarding the shipment of the battery charger to South Korea and Malaysia.
- Use an electric wire which still has some length to spare even when the handlebars are turned all the way to both sides. Furthermore, check that the shifting lever does not touch the bicycle frame when the handlebars are turned all the way.
- Use the specified cable and cable guide for smooth operation.
- When replacing the brake oil, be careful not to let the oil splash onto the system information display. This may damage the product.

Electric wires/Electric wire covers

- Secure the electric wires with a zip tie so that they do not interfere with the chainrings, sprockets or tires.
- The strength of the adhesive is fairly weak to prevent the paint on the frame from being peeled off when removing the electric wire cover, such as when replacing the electric wires. If the electric wire cover is peeled off, replace it with a new one. When removing the electric wire cover, do not peel it off too vigorously. If so, the paint on the frame will peel off, too.
- Do not remove the wire holders which are attached to the built-in type electric wires (EW-SD50-I). The wire holders prevent the electric wires from moving inside the frame.
- When installing to the bicycle, do not forcibly bend the electric wire plug. It may result in a poor contact.

Shifting switch

- Dummy plugs are installed at the time of shipment from the factory. Do not remove them except when necessary.
- When routing the electric wires, take care to ensure that they do not interfere with the brake levers.

Rear derailleur

- Always be sure to adjust the top adjustment bolt and the low adjustment bolt according to the instructions given in the adjustment section. If these bolts are not adjusted, the chain may become clamped between the spokes and the largest sprocket and the wheel may lock, or the chain may slip onto the small sprocket.
- Periodically clean the derailleur and lubricate all moving parts (mechanism and pulleys).
- If gear shifting adjustments cannot be carried out, check the degree of parallel of the rear dropouts.
- The pulley has an arrow on it to indicate the direction of rotation. Make sure that the arrow points in the direction of movement of the chain.

The actual product may differ from the illustration because this manual is intended mainly to explain the procedures for using the product.

For Installation to the Bicycle, and Maintenance:

Notes on reinstalling and replacing components

- When the product is reassembled or replaced, it is automatically recognized by the system to allow operation according to the settings.
- If the system does not operate after reassembly and replacement, follow the system power reset procedure below to check the operation.
- If the component configuration changes or malfunction is observed, use the E-TUBE PROJECT software to update the firmware of each component to the latest version and perform a check again. Also make sure that the E-TUBE PROJECT software is the latest version. If the software is not the latest version, the component compatibility or the product functions may not be available.

Be sure to also inform users of the following:

About used batteries

• Lithium-ion batteries are recyclable, valuable resources. For information on used batteries, contact the place of purchase or a bicycle dealer.

About system power reset

- When the system fails to operate, it may be recovered by resetting the system power.
- After the battery is removed, about one minute is usually required for the system power to reset.

In the case of using SM-BTR1

• Remove the battery from the battery mount. After about one minute, install the battery.

In the case of using SM-BTR2/BT-DN110/BT-DN110-A

• Disconnect the plug from SM-BTR2/BT-DN110/BT-DN110-A. After about one minute, insert the plug.

Connection and communication with PC

• PC linkage devices can be used to connect a PC to the bicycle (system or components), and an E-TUBE PROJECT can be used to carry out tasks such as customizing single components or the whole system and updating their firmware.

If your versions of E-TUBE PROJECT software and firmware for each component are not up to date there could be problems operating the bicycle. Check the software version and update it to the latest one.

	PC linkage device	E-TUBE PROJECT	Firmware
SM-BMR2/SM-BTR2	SM-PCE1/SM-BCR2	Version 3.0.0 or later	Version 3.0.0 or later
BT-DN110/BT-DN110-A/			Version 4.0.0 or later
BM-DN100			

Connection and communication with smartphone or tablet

- It is possible to customize single components or the system, and update firmware, using E-TUBE PROJECT for smartphones/tablets after connecting the bicycle (system or components) to a smartphone or tablet via Bluetooth LE.
 - E-TUBE PROJECT: app for smartphones/tablets
 - Firmware: software inside each component
- Disconnect Bluetooth LE when not using E-TUBE PROJECT for smartphones/tablets. Using the system information display without disconnecting Bluetooth LE may result in high battery power consumption.

About compatibility with E-TUBE PROJECT

• For details on compatibility with E-TUBE PROJECT, refer to the following website. (http://e-tubeproject.shimano.com/guide/#guide_list)

LIST OF TOOLS TO BE USED

LIST OF TOOLS TO BE USED

	Tool		Tool		Tool
	2 mm hexagon wrench	5	5 mm hexagon wrench	TL-FDM905	TL-FDM905
	2.5 mm hexagon wrench	(#2	Screwdriver[#2]	Ö	Snap ring pliers
3	3 mm hexagon wrench	#30	Hexalobular[#30]		
4	4 mm hexagon wrench	TL-EW02	TL-EW02		

The following tools are needed for installation, adjustment, and maintenance purposes.

INSTALLATION

INSTALLATION

Electrical wiring diagram

The connections shown below are only examples. The wiring method may differ depending on the type of frame. For details, contact a manufacturer of completed bicycles.

External battery type (without suspension connection/SM-BTC1)



External battery type (without suspension connection/SM-JC40)



 (A) Battery mount SM-BMR2/BM-DN100
 (B) Battery SM-BTR1
 (C) Junction B SM-JC40

Cable length (EW-SD50)
[a] + [b] ≤ 900 mm
[a] + [c] ≤ 1100 mm
[d] ≤ 1400 mm
[e] ≤ 500 mm
[f] ≤ 500 mm Electrical wiring diagram

External battery type (with suspension connection/SM-BTC1)



External battery type (with suspension connection/SM-JC41)



Electrical wiring diagram

Built-in battery type (seat post type) without suspension connection



Built-in battery type (seat post type)



Installing the system information display

Built-in battery type (head tube type)



Installing the system information display

Install the system information display or junction A first.

Replacing the clamp band



Installing the system information display

Installing to the handlebar



INSTALLATION

Installation of junction A

Installation of junction A



INSTALLATION

Installation of the shifting switch

Installation of the shifting switch

The illustration shows the right-side lever.



Installation of the front derailleur

Types of adapters

There are four types of front derailleur adapters. Choose one according to the shape of the frame.



Installing the adapter



Installation on rear suspension types



Band type



Type E



INSTALLATION

Installation of the front derailleur



flat part of the chain guide outer plate is directly above and parallel to the largest

Make sure that distance from the tip of the teeth of the largest chainring is 1 to 3 mm, then mount the mounting bolt.

- (A) Chain guide outer plate
- (B) Largest chainring

NOTICE

Make sure not to position the chain guide as shown in the illustration.



TECH TIPS

If the clearance does not fall within the range, adjust the fixing position with the elongated hole and fix the fixing bolt again.

INSTALLATION

Installation of the front derailleur

Type D



Installation of the rear derailleur

Installation of the rear derailleur

Standard type



Direct mount type



Replacing with a direct mount type



Connection of the electric wires

Precautions for connecting electric wires

Use the Shimano original tool for installation and removal of the electric wire. When connecting the electric wires, do not forcibly bend the plug. It may result in a poor connection. When connecting electric wires, push them in until you feel and hear a click.



Connecting the shifting switch



Installing the system information display/junction A



Connect the electric wire of the shifting switch to the system information display or to junction A. (A) System information display

(B) Junction A

2

Connect the electric wire that connects to the battery.

NOTICE

The dummy plug must be attached when the front shifting switch is not used.

Connecting the front derailleur



Connecting the rear derailleur


Installation of the battery

■ Installation of the battery

In the case of an external battery (SM-BTR1)

Installation of the battery mount



Installation of the battery



Installation of the electric wire cover



Installation of the battery



Installation of the battery

Installation of the bottle cage adapter

If the bottle cage which is installed to the seat tube interferes with the battery, move the position of the bottle cage upward.

The installation position for the bottle cage can be moved upward by a minimum of 32 mm and a maximum of 50 mm from the original installation position.



(y) 15 m	m		
(z) 10 m	m		
(A) Space	er		
	Tightening torque		
3 N·m			
 If it interferes with the mounting boss for the front derailleur, use the included spacer. 			
 Refer to the Service Instructions for the bottle cage for details on the tightening 			

torques.

Installation of the battery

In the case of a built-in battery (SM-BTR2/BT-DN110/BT-DN110-A)

Installation of the built-in battery



Installation of the battery

In the case of an external battery (SM-BTR2, BT-DN110/BT-DN110-A/SM-BTC1)

Preparing to install



Installation of the battery

Installing the battery case and connecting the electric wires

Use the mounting bolts to mount the battery case to the frame at one of the mounting points so that bolts are in the center of the frame installation holes of the battery case as shown in the illustration.



- (A) Battery case
- (B) Frame installation hole
- (C) Washer
- (D) Fixing bolt (M5)



NOTICE

When installing the bottle cage, do so using whichever torque is the lowest among the battery case, the frame, or the bottle cage's respective tightening torque upper limits.



Connect the electric wires.

Connect the electric wires from each component to an empty port in the junction assembly.

Use the Shimano original tool when connecting.

Be sure to connect dummy plugs to any unused ports.

- (A) Junction assembly
- (B) Dummy plug
- (C) Electric wire
- (D) Shimano original tool (TL-EW02)



The electric wires for battery connection are connected by default. If the electric wires are disconnected, insert the connector into the port with a depression in it, and fix the electric wire to the groove on the side.



INSTALLATION

Installation of the battery



INSTALLATION

Installation of the battery

6		Pass the electric wires connected to the junction assembly through the hole in cap A.Mount cap A to the battery case as shown in the illustration.Fix to the battery case using the supplied fixing bolt.	 (A) Cap A (B) Fixing bolt (M3) Tightening torque 0.26 - 0.4 N·m
7		With the connecting terminal side facing up, insert the battery from the upper part of the battery case. Install so that the connecting terminal opening is oriented as shown in the illustration.	 (A) Connection terminal (B) Connecting terminal opening
8	TL-EW02 (A)	Connect the electric wire to the battery connecting terminal using the Shimano original tool.	(A) Shimano original tool (TL-EW02)
9		Install cap B to the battery case, and fix it in place using the supplied fixing bolt.	 (A) Cap B (B) Fixing bolt Tightening torque 0.26 - 0.4 N·m NOTICE Make sure that the electric wire is not pinched by the cap.

Installation of the battery

Removing the battery



Connecting the suspension

When connecting the suspension, use one that is compatible with the system. For details on how to connect it, contact the manufacturer of the suspension.

Checking connections



Connect the electric wires to all of the components, install the battery, and then check the operation.

Operate the shifting switches and check that the front and rear derailleurs both operate.

_	(A) Shifting switch
	If the front or rear derailleur does not operate properly, refer to the section "CONNECTION AND COMMUNICATION WITH DEVICES".

Installation of the chain

Installation of the chain

Chain length



Basic operations of the shifting switch

HOW TO OPERATE

Basic operations of the shifting switch



Factory default setting of the shifting switch:

The shifting switch is set at default to shift the gear in the directions shown in the illustration.

NOTICE

Check the firmware version of the system before use. Check the version compatibility of the firmware according to the section "CONNECTION AND COMMUNICATION WITH DEVICES". If the firmware is old, update it to the latest version.



You can configure the settings in E-TUBE PROJECT. For details, refer to "CONNECTION AND COMMUNICATION WITH DEVICES" – "Settings customizable in E-TUBE PROJECT".

Gear position control

Gear position control

This gear-shifting system is programmed to prevent shifting into gears that would lower the chain tension. Therefore, if you try to shift into such gears, shifting may function differently from the basic operations. The illustration below shows the gear positions that would lower the chain tension and the shifting operations performed when you shift into those gears.

Points to remember when shifting the front derailleur

When you shift into the smallest chainring, shifting is controlled as follows.



When the chain is in the ranges [1] or [2] in the illustration Operating the shifting switch does not shift the front derailleur.

Instead, the rear derailleur is shifted down through two gears.

When the chain is outside the ranges [1] or [2] in the illustration Operating the shifting switch shifts the front derailleur to the smallest chainring. [1] From the smallest to the third sprocket.

[2] Smallest sprocket

NOTICE

 If you use combinations of front and rear derailleurs besides those recommended, the shifting-restricted range may become larger.

Points to remember when shifting the rear derailleur

When the chain position is in the smallest front chainring, gear shifting is controlled as follows.



When shifting the rear in the direction of the smallest sprocket Operating the shifting switch will not shift the chain into ranges [1] or [2] in the illustration.



- [1] From the smallest to the third sprocket.
- [2] Smallest sprocket

Displaying and operating the system information display

Displaying and operating the system information display

Names of parts



Basic screen display



Displaying and operating the system information display

Battery level



Display	Battery level
	81% – 100%
	61% - 80%
	41% - 60%
	26% - 40%
	1% – 25%*1*2*3
	0%*3

(A)	Battery	level
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- *1 When the battery level is low, the operation of the suspension will be limited to the lock release. The operation of the rear suspension is restricted first, then that of the front suspension.
- *2 When the battery level drops below 5%, the operation of the front derailleur is restricted.



*3 When the battery level decreases further, both the suspensions and derailleurs cease operating, with the derailleurs fixed at the last shifted position. The battery indicator blinks for 2 seconds at the time of input operation. It is recommended to charge the battery as soon as possible.

Displaying and operating the system information display

Front derailleur: Gear position

	(B)	(B) Front derailleur: Gear position
	F R M F F M M S1 S1 S1 GEAR SUS	
Display	Gear position	
T	Largest chainring	The gear position of the front derailleur is
M)	Middle chainring	displayed. * In the case of double specification, only the
L	Smallest chainring	largest chainring and smallest chainring are displayed.

Rear derailleur: Gear position/Adjustment level



Setting mode	Details	
Shift mode	The gear position of the rear derailleur is displayed.	
Adjustment mode	When adjusting the front derailleur and rear derailleur, the adjustment level is displayed.	

TECH TIPS

The display information varies depending on the mode setting.

Displaying and operating the system information display

RD Protection Reset mode



Displaying and operating the system information display

Operation mode



Display	Details
F R	Adjustment setting (front derailleur/rear derailleur) The front derailleur or rear derailleur can be adjusted in this mode. For the setting procedure, contact a dealer or an agency.
Μ	Manual shift Gears are shifted manually in this mode.
S1	Shift mode 1 The shift mode set in E-TUBE PROJECT can be used. The initial setting for MTB is Synchronized shift 1. This setting mode is designed for riders with strong legs.
S 2	Shift mode 2 The shift mode set in E-TUBE PROJECT can be used. The initial setting for MTB is Synchronized shift 2. This setting mode is designed for courses with considerable terrain variation.

(E) Operation mode

Displaying and operating the system information display

How to operate



Switching operating modes

When using a system information display, combine it with one of the following units. External type: BM-DN100, Built-in type: BT-DN110/BT-DN110-A



Switching selections in each mode



Error message

RD Protection Reset

Holding the mode button down for at least 5 seconds when RD Protection is in operation will reset the system connection and restore normal operation.





RD Protection is a function that cuts the

transmission of power between the motor and the link in cases where the rear derailleur is pressed in by a strong impact such as from when falling from the bicycle. The rear derailleur cannot function when RD Protection is in operation. If this happens, pressing the mode button on the system information display or the button on junction A for 5 seconds or more will restore the connection between the motor and the link and the rear derailleur will start operating normally. The connection can also be restored manually. For details, contact the distributor.

Error message

About the beep

Beep sounds	Situation	
One short beep	Indicates that the gear shifting limit has been reached. (When the chain is on the highest gear for both front and rear or lowest gear for both front and rear)	
Two short beepsIndicates that the front chainrings are being shifted in the synchroniz mode. These beeps sound the next time the front chainrings are shift		
One long been	Indicates that the front derailleur cannot be shifted when the battery is running low. Blinking continues for 2 seconds after the sound has stopped. (Only one beep sounds when the gears are shifted)	
One long beep	Indicates that there is an error with the suspension. All suspension mode arrows blink and continue to blink for 2 seconds after the sound has stopped.	



Beeps are set to sound in certain situations during gear operation.

About wireless functions

About wireless functions

Functions

Cycle computer connection

ANT^{+™} connection transmits the following four types of information to cycle computers or receivers that are compatible with ANT^{+™} or Bluetooth[®] LE connections.

(1)	Gear position (front, rear)
(2)	DI2 battery level information
(3)	Adjustment mode information
(4)	D-FLY channel switch information

For information on which of the above types of information are displayed, refer to the manual for your cycle computer or receiver.

E-TUBE PROJECT connection

E-TUBE PROJECT for smartphones/tablets may be used if a Bluetooth LE connection is established with a smartphone/tablet.

How to make connections

Cycle computer connection

To make a connection, the cycle computer needs to be in connection mode. For information on how to put the cycle computer into connection mode, refer to the manual for the cycle computer.

1	

2

Put the cycle computer into connection mode.

Perform gear shifting operations. If you cannot connect after performing gear shifting operations, perform the following operations.

When using an external battery

Check that the electric wires are connected to the system information display, and then remove and remount the external battery.

When using a built-in battery

Check that the electric wires are connected to the system information display, and then remove the electric wires from the system information display and reconnect them.



The latest functions can be checked by updating the software via E-TUBE PROJECT. For details, consult the place of purchase.



Connection transmission begins about 30 seconds after the battery is remounted or the electric wires are reconnected to the system information display.

About wireless functions

This co	ompletes the connection process.	
		Check on the cycle computer to see if connection was successful.
3		 If a connection cannot be made in the way described above, refer to the manual for your cycle computer.
		 For information on how to show gear position or the DI2 battery level, refer to the manual for the cycle computer.

E-TUBE PROJECT connection

Before setting up a connection, turn on Bluetooth LE on the smartphone/tablet.

1	Open E-TUBE PROJECT and set it to listen for Bluetooth LE signals.
	Setting up via system information display Press the mode switch until "C" appears on the display.
2	C
	Setting up via junction A Press the button on junction (A) until the green LED and red LED begin to blink alternately.
	The unit on the bicycle will begin signal transmission. The unit name displays in E-TUBE
3	(Release the mode switch or button as soon as the unit on the bicycle begins signal transmission. If the mode switch or button is held down for any longer, a different mode will be activated.)
	Select the unit name displayed on screen.
4	



To disconnect, cancel the Bluetooth LE connection from the smartphone/tablet. (The cycle computer will exit connection mode and return to regular operation mode.)

Adjustment of the rear derailleur

ADJUSTMENT









Adjustment of the rear derailleur

9

Shift to each gear and check that no noise or chain jamming is generated at any gear position.

If adjustment is needed, switch back to adjustment mode and readjust the rear derailleur.



Adjust the low-side stopper adjustment bolt with a 2 mm hexagon wrench.

Shift the rear derailleur to the largest sprocket, and then tighten the low-side stopper adjustment bolt until it just touches the outer link.

If it is tightened too much, the motor will detect a problem and gear shifting will not operate correctly.

(z) 2 mm hexagon wrench

(A) Low-side stopper adjustment bolt

Possible occurrences if the adjustment bolt is overtightened

- Gears do not shift to the top/low gear. (Even if you shift gears to the top or low gear, the gear may shift back by one gear after about 5 seconds.)
- Noise does not stop.
- The battery level drops quickly. (Load is being placed on the motor)
- The motor may be damaged. (irreparable)



Adjust the top-side stopper bolt with a 2 mm hexagon wrench.

Shift to the smallest sprocket, and then tighten the top-side stopper bolt until it touches the inner link at the position where the rear derailleur stops.

(z) 2 mm hexagon wrench

(A) Top-side stopper bolt

Adjustment of the front derailleur

Adjustment of the front derailleur

Adjust the front derailleur using the following procedure.

Top side position adjustment	Use the adjustment bolt of the front derailleur for adjustment.
Low-side position adjustment	Switch the system information display to adjustment mode and use the shifting switch for adjustment.

The shifting switch configuration is divided into two types: right and left shifting switches or a one-side shifting switch. The adjustment of the front derailleur differs depending on the type used. Refer to "When using two shifting switches for adjustment" or "When using one shifting switch for adjustment" depending on the number of shifting switches your bicycle has.

When using two shifting switches for adjustment

Top side position adjustment



Adjustment of the front derailleur



Adjustment of the front derailleur

Low-side position adjustment



Adjustment of the front derailleur



Adjustment of the front derailleur

When using one shifting switch for adjustment

Top side position adjustment



Adjustment of the front derailleur



After adjustment, securely tighten the stroke mounting bolt while pushing the chain guide towards the frame.

(A) Stroke mounting bolt



Low-side position adjustment



Adjustment of the front derailleur



 \Box

S1

(A) Front derailleur adjustment
Adjusting rear derailleur friction

Troubleshooting chart

After adjusting the front derailleur, check the shifting by operating the shifting lever.

(This also applies if shifting becomes difficult during use.)

Use the table as a reference when adjusting the bolts. Turn the screw by 1/8 of a turn for each adjustment of the top side position and by 1 click for each adjustment of the low side position.

NOTICE

After adjusting the top adjustment bolt, recheck the low side position.

If the chain falls to the crank side.	Turn the top adjustment bolt counterclockwise.	
If shifting is difficult from the smallest chainring to	Turn the top adjustment bolt clockwise.	
the largest chainring.		
If shifting is difficult from the largest chainring to the	Perform readjustment according to "Low-side position adjustment" in "Adjustment of the	
smallest chainring.	front derailleur". Adjust the chain guide inward (X direction).	
If the chain falls to the bottom bracket side.	Perform readjustment according to "Low-side position adjustment" in "Adjustment of the front derailleur". Adjust the chain guide outward (Y direction).	

Adjusting rear derailleur friction

The friction capacity can be adjusted as desired. Furthermore, you can also adjust after a change of the friction occurs during use.

Friction adjustment

1	Move the lever switch to the ON position.		
2		Remove the plate unit cap by hand as shown in the illustration.	(A) Plate unit cap

ADJUSTMENT

Adjusting rear derailleur friction



CHARGING THE BATTERY

Names of parts

CHARGING THE BATTERY

Use the specified combination of lithium ion batteries, chargers, and linkage devices. Any other combinations may cause rupture or fire. Fully understand the precautions for use provided at the beginning of the dealer's manual before using the products.

Names of parts

External type (SM-BCR1/SM-BTR1)

Battery charger (SM-BCR1)



Names of parts

Special battery (SM-BTR1)





• This is a special charger for charging Shimano lithium ion batteries (SM-BTR2/ BT-DN110/BT-DN110-A).

TECH TIPS

[•] If water collects in the product connector, connect the plug only after wiping it off.

Charging the battery

Battery (SM-BTR2/BT-DN110/BT-DN110-A)



Charging the battery



battery charger in a suitable place as specified in the safety precautions.

CHARGING THE BATTERY

Charging the battery

Built-in type (SM-BCR2/SM-BTR2, BT-DN110/BT-DN110-A)



Disconnect the charging cable or USB cable, and keep it at the location specified in the precautions.

When charging is not possible

When charging is not possible

External type (SM-BCR1/SM-BTR1)



When charging is not possible

Built-in type (SM-BCR2/SM-BTR2, BT-DN110/BT-DN110-A)



CONNECTION AND COMMUNICATION WITH DEVICES

Settings customizable in E-TUBE PROJECT

CONNECTION AND COMMUNICATION WITH DEVICES

Connecting the bicycle (system or components) to a device enables such operations as updating system firmware and customization.

You need E-TUBE PROJECT to configure the system and update firmware.

Download E-TUBE PROJECT from our support website (http://e-tubeproject.shimano.com).

For information on how to install E-TUBE PROJECT, check the support website.



You need SM-PCE1 and SM-JC40/JC41 to connect the system to a PC. They are not required if there is an available port. Firmware is subject to change without notice.

System requirements

	PC linkage device	E-TUBE PROJECT	Firmware	NOTICE
SM-BMR2/ SM-BTR2			Version 3.0.0 or later	If your versions of E-TUBE PROJECT software and firmware for each component are not up
BT-DN110/ BT-DN110-A/	SM-PCE1/SM-BCR2	Version 3.0.0 or later	Version 4.0.0 or later	to date there could be problems operating the bicycle. Check the versions and update them to the latest ones.
BM-DN100				

Settings customizable in E-TUBE PROJECT

	Beep setting	You can switch the beep between ON and OFF.	
Display settings	Display time	Sets the time until the display turns off when the display monitor is left unattended.	
Switch setting		Changes the function settings of the shifting switch and suspension switch.	
Synchronized shift map setting		Modify the synchronized shift map settings.	
Suspension type setting		Set the suspension type.	
	Multi-shift mode ON/OFF	Select whether or not to use multi-shift.	
Multi-shift mode setting	Gear-shifting interval	Sets the gear-shifting interval for multi-shift.	
	Gear number limit	Sets the limit on the number of gears shifted when the shifting switch is he down.	

CONNECTION AND COMMUNICATION WITH DEVICES

Settings customizable in E-TUBE PROJECT

Synchronized shift map

Synchronized shift is a function that automatically shifts gears on the front derailleur in synchronization with rear derailleur gear shifting. The numbers of switch gears for synchronized shift are configured by default as shown in the charts.

Triple specification





- (A) Smallest chainring
- (B) Middle chainring
- (C) Largest chainring

Double specification



• Synchronized shift 2



- (A) Smallest chainring
- (B) Largest chainring

Connecting to a PC

Connecting to a PC

If there is an empty port in the system information display



- (A) SM-PCE1
- (B) Dummy plug

Connecting to a PC

If there are no empty ports in the system information display

When the electric wire can be disconnected from the shifting switch



- (A) Shifting switch
- (B) Electric wire
- (C) System information display

CONNECTION AND COMMUNICATION WITH DEVICES

Connecting to a PC

Connect an unoccupied port of the system information display or shifting switch to an unoccupied port of SM-PCE1 as shown in the illustration.

Use the two PC link cables provided with SM-PCE1 for connection.



When the electric wire cannot be disconnected from the shifting switch



(A) PC link cable(B) SM-PCE1

Replacing parts – shifting switch

MAINTENANCE

Replacing parts – shifting switch

Replacing the lever

Lever [X] and lever [Y] can be replaced.



Replacing parts – rear derailleur

Replacement of the plate and the plate tension spring

Exploded view



Replacing parts – rear derailleur

Removal



MAINTENANCE

Replacing parts – rear derailleur



Replacing parts – rear derailleur

Installation



Replacing parts – rear derailleur



Applying grease to the chain stabilizer

If the friction changes or noise is generated, the grease may have become discolored or may have disappeared. Apply more grease. * Reassemble by carrying out the disassembly procedure in reverse.

Move the lever switch to the OFF position.
a move the plate unit cover.
(A) Plate unit cover.
(B) Lever switch
(C) Plate unit

Replacing parts – rear derailleur



Replacing parts – rear derailleur

Replacement of the pulley

Guide pulley



Tension pulley



Replacing rubber pad B

Replacing rubber pad B

Removal



Installation

1	Align the rubber pad B mounting hole of the chain guide with the protrusion of rubber pad B.	(A) Rubber pad B mounting hole
2	Push in the protrusion from the reverse side of rubber pad B.	
3	Make sure that the protrusion of rubber pad B is securely fitted on the chain guide.	

Disconnection of the electric wires

Disconnection of the electric wires

NOTICE

- Do not keep connecting and disconnecting the small waterproof connector. The waterproof section or the connecting section may become worn or deformed, and the function may be affected.
- When removing the electric wire, use the wider end of the Shimano original tool TL-EW02 as shown in the illustration. If you pull too firmly on an electric wire without using the Shimano original tool, a malfunction may occur.
- Forcibly disconnecting an electric wire may damage it.

Disconnection from the front derailleur



Disconnection from the rear derailleur



Push down the plug cover using the Shimano original tool.

Insert the Shimano original tool into the groove in the electric wire and remove the wire.

- (A) Shimano original tool (TL-EW02)
- (B) Plug cover

SHIMANO

SHIMANO NORTH AMERICA BICYCLE, INC.

One Holland, Irvine, California 92618, U.S.A. Phone: +1-949-951-5003

SHIMANO EUROPE B.V.

High Tech Campus 92, 5656 AG Eindhoven, The Netherlands Phone: +31-402-612222

SHIMANO INC.

3-77 Oimatsu-cho, Sakai-ku, Sakai City, Osaka 590-8577, Japan

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