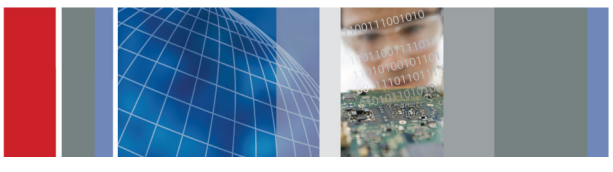
WFM200BA
Rechargeable Battery Pack

Instructions



075-1041-02

Tektronix

General safety summary

Use the product only as specified. Review the following safety precautions to avoid injury and prevent damage to this product or any products connected to it. Carefully read all instructions. Retain these instructions for future reference.

Comply with local and national safety codes.

For correct and safe operation of the product, it is essential that you follow generally accepted safety procedures in addition to the safety precautions specified in this manual.

The product is designed to be used by trained personnel only.

This product is not intended for detection of hazardous voltages.

To avoid fire or personal injury

Do not operate with suspected failures. If you suspect there is damage to the battery, charger, or power supply, have it inspected by qualified service personnel.

Disable the product if it is damaged. Do not use the product if it is damaged or operates incorrectly. If in doubt about safety of the product, turn it off and disconnect the power cord. Clearly mark the product to prevent its further operation.

Examine the exterior of the product before you use it. Look for cracks or missing pieces.

Recharge battery pack properly. Recharge the battery pack only for the recommended charge cycle at the recommended temperature.

Replace battery pack properly. Replace the battery pack only with the specified type and rating.

Use proper battery charger. Use only the WFM2200, WFM2200A, and WFM2300 waveform monitors or the WFM200BC battery charger to charge the WFM200BA battery pack.

Do not operate in wet/damp conditions. Be aware that condensation may occur if a unit is moved from a cold to a warm environment.

Do not operate in an explosive atmosphere.

Keep product surfaces clean and dry.

Do not attempt to service this product. There are no serviceable components in the WFM200BA battery.

Safety terms in this manual

CAUTION. *These statements identify conditions or practices that could result in damage to the equipment or other property.*

Safety symbols and terms on the product

DANGER indicates an injury hazard immediately accessible as you read the marking.

WARNING indicates an injury hazard not immediately accessible as you read the marking.

CAUTION indicates a hazard to property including the product.

CAUTION
Refer to Manual

Compliance information

The WFM200BA battery, including all battery options, meets the following requirements unless otherwise noted. Compliance demonstrated using high quality, shielded interface cables.

European Union

EMC Directive 2004/108/EC.

- EN 55103-1:2009 Environment E2 – Product family standard for audio, video, audio-visual. Industrial and light commercial. Part 1: Emission.
  - EN 55022:2006 Class B – Radiated and conducted emissions
  - EN 55103-1:2009 Annex A – Radiated magnetic field emissions
- EN 55103-1:2009 Environment E2 – Product Family Standard for Audio, Video, Audio-visual. Industrial and Light Commercial. Part 2: Immunity.
  - EN 55103-2:2009 Annex A – Radiated Magnetic Field Immunity
  - IEC 61000-4-11:2004 – Power Line Voltage Dip and Interruption Immunity
  - IEC 61000-4-2:2000 – Electrostatic Discharge Immunity
  - IEC 61000-4-3:2007 – RF Electromagnetic Field Immunity
  - IEC 61000-4-4:2004 – Electrical Fast Transient / Burst Immunity
  - IEC 61000-4-5:2005 – Power Line Surge Immunity
  - IEC 61000-4-6:2006 – RF Conducted Immunity
- EN 61000-3-2:2006 – AC Power Line Harmonic Emissions
- EN61000-3-3:1995 – Voltage Changes, Fluctuations, and Flicker

European contact. Tektronix UK, Ltd.
Western Peninsula
Western Road
Bracknell, RG12 1RF
United Kingdom

Australia / New Zealand

Australia Radiocommunications Act 1992.

- EN 55022:2006 Class B – Radiated and conducted emissions, in accordance with EN 55103-1:2009
- Supplier Code: N60

Australia / New Zealand contact.
Baker & McKenzie
Level 27, AMP Centre
50 Bridge Street
Sydney NSW 2000, Australia

Battery recycling

This WFM200BA Lithium-Ion rechargeable battery pack must be recycled or disposed of properly.

- Lithium-Ion batteries are subject to disposal and recycling regulations that vary by country and region. Always check and follow your applicable regulations before disposing of any battery. Contact Rechargeable Battery Recycling Corporation (www.rbrc.org) for U.S.A. and Canada, or your local battery recycling organization.
- Many countries prohibit the disposal of waste electronic equipment in standard waste receptacles.
- Place only discharged batteries in a battery collection container. Use electrical tape or other approved covering over the battery connection points to prevent short circuits.

This symbol indicates that this product complies with the applicable European Union requirements according to Directives 2002/96/EC and 2006/66/EC on waste electrical and electronic equipment (WEEE) and batteries. For information about recycling options, check the Support/Service section of the Tektronix Web site (www.tektronix.com).

Lithium-Ion battery transportation

The capacity of the WFM200BA lithium ion battery pack is under 100 Wh. The battery meets the applicable requirements of UN Manual of Tests and Criteria Part III Section 38.3. As shipped from Tektronix, the battery quantity is under the limit for shipment according to Section II of the relevant Packing Instructions from the IATA Dangerous Goods Regulations. Consult your air carrier for applicability and determination of any special lithium battery transportation requirements.

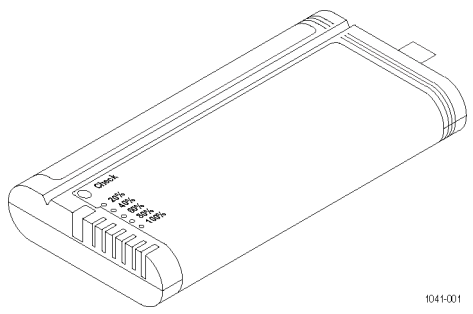
- Always check all applicable local, national, and international regulations before transporting a Lithium-Ion battery.
- Transporting an end-of-life, damaged, or recalled battery may, in certain cases, be specifically limited or prohibited.
- The battery pack must be adequately protected against short-circuit or damage during transport.

Description

The WFM200BA rechargeable battery pack is intended for use only with the Tektronix WFM2200, WFM2200A, and WFM2300 SD/HD/3G-SDI Waveform Monitors & Generators. The battery pack consists of an array of Lithium-Ion battery cells.

When the battery is installed, an internal circuit monitors the charge on the battery and reports the condition to either the waveform monitor or the WFM200BC External Battery Charger.

When the battery is not installed, you can check the battery charge level by pressing the Check button on the back of the battery pack. LEDs illuminate to indicate the amount of charge in increments of approximately 20%.

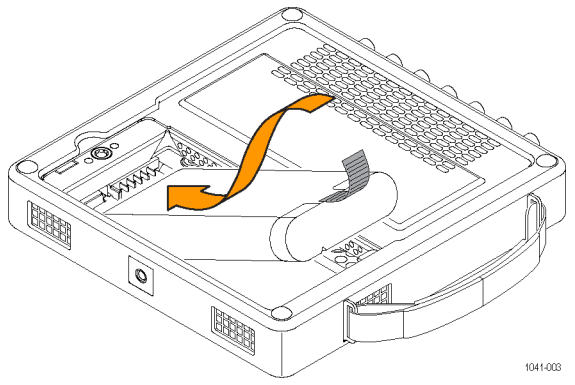


Battery pack installation

NOTE. *For optimum performance, charge the battery pack completely before using it for the first time or after prolonged storage.*

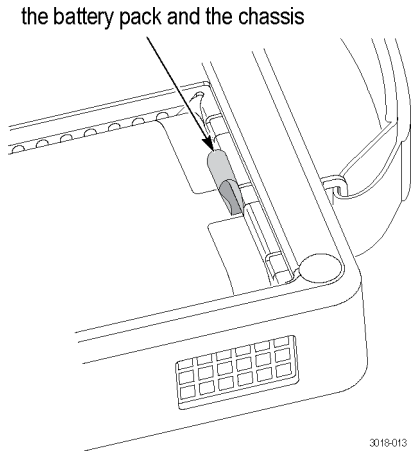
The battery can be installed, removed, or replaced while the instrument is turned on and operating with the AC adapter.

1. On the rear panel of the instrument, remove the cover for the battery compartment as follows:
   - WFM2200A and WFM2300 only: Use your fingers or a coin to turn the battery cover screw counterclockwise until you can lift the cover away from the instrument.
   - WFM2200 only: Lift up the battery cover ring and turn the ring ¼ turn counterclockwise until you can lift the cover away from the instrument.
2. Insert the WFM200BA battery pack into the battery compartment as shown below.



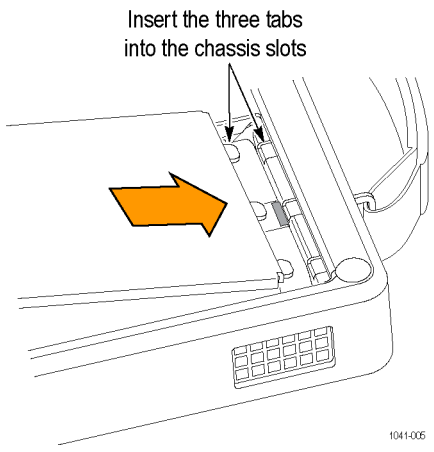
3. Secure the battery pack tab as shown below.

Fold the end of the tab between the battery pack and the chassis



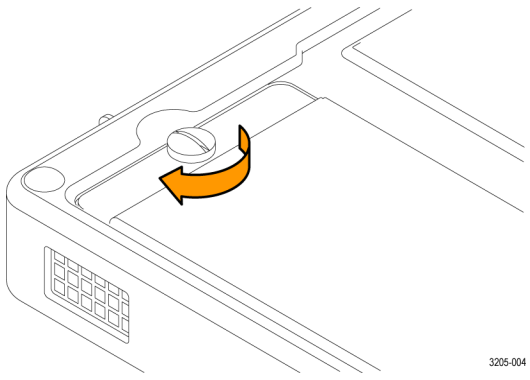
4. Replace the battery compartment cover:

   a. Insert the three tabs on the battery cover into the chassis slots as shown below.

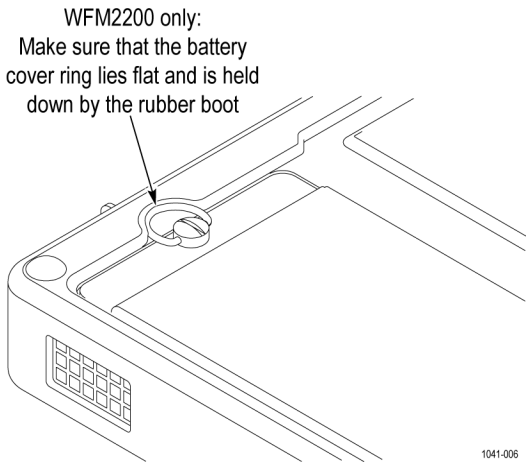


   b. Close the battery cover as follows:

   - WFM2200A and WFM2300 only: Use your fingers or a coin to turn the battery cover screw clockwise to secure the cover.



   - WFM2200 only: Turn the battery cover ring ¼ turn clockwise to secure the cover. Press the battery cover ring down so that it latches into place as shown below.



Battery maintenance guidelines

The WFM200BA Lithium-Ion rechargeable battery pack requires routine maintenance and care in its use and handling. Be sure to use the following guidelines to safely use the WFM200BA Lithium-Ion batteries and achieve the maximum battery life span.

Battery pack considerations

Do not leave a battery unused for an extended period of time, either in the product or in storage. When a battery has been unused for six months, check the charge status, and charge or dispose of the battery as appropriate. See *Charging the battery pack* and *Battery recycling*.

The typical estimated life of a Lithium-Ion battery is about two to three years, or 300 to 500 charge cycles, whichever occurs first. One charge cycle is a period of use from fully charged, to fully discharged, and fully recharged again. You should expect a two to three year life expectancy for batteries that do not run through complete charge cycles.

A rechargeable Lithium-Ion battery has a limited life and will gradually lose its capacity to hold a charge. This loss of capacity (aging) is irreversible. As the battery loses capacity, the length of time it will power the product (run time) decreases.

A Lithium-Ion battery continues to slowly discharge (self-discharge) when not in use or while in storage. You need to routinely check the charge status of the battery.

Use the WFM200BA battery pack only in Tektronix WFM2200, WFM2200A, or WFM2300 waveform monitors. Use only WFM200BA battery packs in these Tektronix waveform monitors.

Battery pack maintenance

- Observe and note the run time that a new fully-charged battery provides for powering your product. You can use this new battery run time as a basis to compare run times for older batteries. The run time of your battery will vary depending on the product's configuration and the applications that you run.
- The battery pack gives the best performance when operated at normal room temperature, 20 °C ±5 °C (68 °F ±9 °F).
- Routinely check the charge status of the battery.
- Carefully monitor a battery that is approaching the end of its estimated life.
- Consider replacing the battery with a new one if the battery run time drops below about 80% of the original run time, or the battery charge time increases significantly.
- Follow the storage requirements if you store or do not use a battery for an extended period. If you do not follow the storage requirements, and the battery will not power the waveform monitor when installed, consider the battery to be damaged. Do not connect power to the waveform monitor during this time. Remove the battery pack from the waveform monitor. Do not attempt to recharge or reuse the battery. Replace it with a new battery.

Battery pack charging

The battery pack charges automatically when the waveform monitor is connected to the external power supply. You can also charge the battery pack with the Tektronix WFM200BC External Battery Charger. Remove the battery pack from the WFM200BC charger when charging is complete.

A Lithium-Ion battery pack will self-discharge during non-use. To achieve the longest operating time, charge your battery pack before use. If you plan to store battery packs, read the instructions in the *Battery pack storage* section of this document.

When the battery pack is in the waveform monitor, the battery gauge ( ) on the waveform monitor display indicates the approximate amount of charge.

- To avoid automatic shutdown of the battery pack, only run the waveform monitor on the battery pack when the gauge on the waveform monitor is green or yellow.
- Always verify the correct placement of the battery in the waveform monitor or the WFM200BC battery charger.
- When the battery pack is installed in the waveform monitor, it will automatically charge whenever the supplied AC adapter is connected, whether the instrument is On, Off, or in Standby mode.

Configuration	Typical charging time
One fully discharged battery pack charging in the waveform monitor with the waveform monitor turned on or off	5.5 hours
One or two fully discharged battery packs charging in the WFM200BC external battery charger	5.5 hours

⚠ ***CAUTION.*** *To avoid damage to the battery pack, use only the WFM2200, WFM2200A, or WFM2300 waveform monitors or the WFM200BC battery charger to charge the battery pack. Do not connect any other voltage source to the battery pack.*

NOTE. *For optimum performance, charge the battery pack completely before using it for the first time or after prolonged storage.*

To discharge the battery pack completely, continue to run the waveform monitor on the battery pack until automatic shutdown occurs. After the instrument shuts down, either recharge the battery pack promptly or remove it from the instrument until you are ready to recharge the battery pack.

NOTE. *To prolong the life of the battery pack and to prevent shutdown, do not operate or charge the battery pack at high temperatures. For best results, allow the battery pack to cool to room temperature before using or charging the battery pack.*

Do not leave a battery pack discharged for extended periods. See the Storing battery packs section for information on how to properly store a battery pack.

The battery pack stops charging under the following conditions:

- The battery pack is fully charged.
- The internal temperature of the battery pack exceeds the safe charging threshold.
- A fault condition occurs.

The battery pack shuts down and disconnects itself from the waveform monitor under the following conditions:

- The battery pack is fully discharged.
- The internal temperature of the battery pack exceeds the safe discharging threshold.
- A fault condition occurs.

Battery pack handling

- Do not disassemble, crush, drop, or puncture the battery.
- Do not short the external contacts on the battery.
- Do not dispose of the battery in fire or water.
- Do not expose the battery to temperatures above +60 °C (+140 °F).
- Seek medical advice if a battery or part of it has been swallowed.
- Do not put battery packs near heat or fire. Do not put in sunlight.
- Keep the battery pack clean and dry. Clean dirty connectors with a dry, clean cloth.
- Batteries contain hazardous chemicals that can cause burns or explode. If exposure to chemicals occurs, clean with soap and water and get medical aid. Repair the product before use if the battery leaks.
- Do not attempt to open, modify, reform or repair a battery pack that appears to be malfunctioning, or which has been physically damaged.
- Keep the battery away from children and animals.
- Avoid exposing the battery to excessive shock or vibration.
- Do not use a damaged battery or charger.
- If a battery pack has leaking fluids, do not touch any fluids. Dispose of a leaking battery pack. See the *Battery recycling* section for information on disposal and recycling.
- In case of eye contact with fluid, do not rub eyes. Immediately flush eyes thoroughly with water for at least 15 minutes, lifting upper and lower lids, until no evidence of the fluid remains. Seek medical attention.

Battery pack storage

- Store battery packs in a low-humidity environment free of corrosive gases. Storing battery packs in high-humidity environments, or outside the temperature range, can cause oxidation on the metallic parts, increased leakage, significant aging and premature failure.
- Do not store battery packs near heat or fire. Do not store in the sunlight.
- Do not keep battery packs in a place where the terminals can be shorted by metal objects (for example, coins, paper clips, or pens).
- Do not remove a battery pack from its original packaging until required for use.
- When possible remove the battery pack from the equipment when not in use.
- Charge the battery to approximately 50% of capacity at least once every six months.
- Remove the battery and store it separately from the instrument. Refer to the documentation for your waveform monitor for instructions on removing and installing the battery.
- For optimal battery life, store the battery at temperatures between +5 °C and +25 °C (+41 °F and +77 °F). Higher temperatures reduce the battery storage life.

Battery pack replacement

Use the instructions to remove and replace battery packs.

NOTE. *Replace the Lithium-Ion battery pack only with a WFM200BA battery pack.*

See the Battery Recycling section for information on how to properly dispose of a Lithium-Ion battery pack.

Specifications

Characteristic	Description
Capacity, typical	6.14 Ah
Output, nominal	14.4 VDC
Charging temperature	Installed in the WFM2200 waveform monitor or WFM200BC battery charger: 10 °C to +40 °C (+50 °F to +104 °F); varies per the WFM2200 heat dissipation characteristics, the actual limit may be lower
Operating temperature	Installed in the WFM2200 waveform monitor: 0 °C to +40 °C (+32 °F to +104 °F)
Storage temperature	-20 °C to +60 °C (-4 °F to +140 °F)
Weight	Battery: 453.6 g (16.0 oz) Battery (including packaging): 567 g (20.0 oz)

Warranty information

For warranty information, go to the www.tektronix.com Web site, and search for "WFM200BA warranty".

Contacting Tektronix

Tektronix, Inc.
14200 SW Karl Braun Drive
P.O. Box 500
Beaverton, OR 97077
USA

For product information, sales, service, and technical support:

- In North America, call 1-800-833-9200.
- Worldwide, visit www.tektronix.com to find contacts in your area.