

BeneVision Central Charger Operator's Manual



mindray

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Contents of this manual are subject to changes without prior notice.

All information contained in this manual is believed to be correct. Mindray shall not be liable for errors contained herein nor for incidental or consequential damages in connection with the furnishing, performance, or use of this manual.

Mindray is responsible for the effects on safety, reliability and performance of this product, only if:

- All installation operations, expansions, changes, modifications and repairs of this product are conducted by Mindray authorized personnel;
- The electrical installation of the relevant room complies with the applicable national and local requirements;
- The product is used in accordance with the instructions for use.

Warnings

- Only skilled/trained clinical professionals should operate this equipment.
- It is important for the hospital or organization that employs this equipment to carry out a reasonable service/maintenance plan. Neglect of this may result in machine breakdown or personal injury.

Warranty

Mindray warrants that components within its products will be free from defects in workmanship and materials for a period of three years from the date of purchase except that disposable or one-time use products are warranted to be free from defects in workmanship and materials up to a date one year from the date of purchase or the date of first use, whichever is sooner.

This warranty does not cover consumable items such as, but not limited to, batteries, external cables, and sensors.

Mindray shall not be liable for any incidental, special, or consequential loss, damage, or expense directly or indirectly arising from the use of its products. Liability under this warranty and the buyer's exclusive remedy under this warranty is limited to servicing or replacing the affected products, at Mindray option, at the factory or at an authorized distributor, for any product which

shall under normal use and service appear to Mindray to have been defective in material or workmanship. Recommended preventative maintenance, as prescribed in the service manual, is the responsibility of the user and is not covered by this warranty.

No agent, employee, or representative of Mindray has any authority to bind Mindray to any affirmation, representation, or warranty concerning its products, and any affirmation, representation or warranty made by any agent, employee, or representative shall not be enforceable by buyer or user.

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Damage to any product or parts through misuse, neglect, accident, or by affixing any non-standard accessory attachments, or by any customer modification voids this warranty. Mindray makes no warranty whatsoever in regard to trade accessories, such being subject to the warranty of their respective manufacturers.

A condition of this warranty is that the equipment or accessories which are claimed to be defective be returned when authorized, freight prepaid to Mindray DS USA, Inc., Mahwah, New Jersey 07430 or its authorized representative. Mindray shall not have any responsibility in the event of loss or damage in transit.

Exemptions

Mindray's obligation or liability under this warranty does not include any transportation or other charges or liability for direct, indirect or consequential damages or delay resulting from the improper use or application of the product or the use of parts or accessories not approved by Mindray or repairs by people other than Mindray authorized personnel.

This warranty does not extend to:

- Malfunction or damage caused by improper use or man-made failure.
- Malfunction or damage caused by unstable or out-of-range power input.
- Malfunction or damage caused by force majeure events, such as (i) flood, fire and earthquake or other similar elements of nature or acts of God; (ii) riots, war, civil disorders, rebellions, or revolutions in any country; or (iii) any other cause beyond the reasonable control of Mindray.
- Malfunction or damage caused by improper operation or repair by unqualified or unauthorized service people.
- Malfunction of the instrument or part whose serial number is not legible.
- Others not caused by instrument or part itself.

Safety Information

Warnings

Indicates a potential hazard or unsafe practice that, if not avoided, could result in death or serious injury.

Cautions

Indicates a potential hazard or unsafe practice that, if not avoided, could result in minor personal injury or product/property damage.

Notes

Provides application tips or other useful information to ensure that you get the most from your product.

Warnings

- Operate the central charger on a stable surface.
- Keep the central charger away from flammable agents, oxygen-rich atmospheres, or flammable anesthetics.
- Keep the central charger out of children's reach.
- Keep the central charger and lithium-ion batteries away from liquids. Use the central charger in dry, indoor locations.
- Transport the central charger with care to avoid injury.
- Ensure that the central charger or lithium-ion battery pack has no sign of damage before use.
- Do not disassemble, puncture, or incinerate the central charger or lithium-ion battery.
- Do not short the battery terminals in order to avoid potential fire hazard.
- Do not stack Mindray central chargers.
- Only use the central charger to charge the lithium-ion batteries specified by Mindray.
- To avoid risk of electric shock, the central charger must only be connected to a supply mains with protective earth.
- Only use the approved power cord with the grounded mains plug to connect the central charger to a grounded AC mains socket. Never modify the mains

plug to fit an ungrounded AC mains socket.

- Do not use Multiple Portable Socket Outlets (MPSO) or AC mains extension cords. Use an IEC 60601-1 approved isolation / separation transformer, otherwise, it may result in leakage current. Ensure that the sum of the individual ground leakage currents does not exceed the allowable limits.
- Do not cover the central charger or lithium-ion batteries. Keep the central charger in a cool and ventilated place while charging the lithium-ion batteries.
- Do not connect other devices to the power supply system.
- Do not use the central charger to charge the lithium-ion batteries at high temperature above 40 °C.
- In the case of failure, disconnect the AC power, remove the lithium-ion batteries from the central charger, and contact your service personnel.

Cautions






- Do not sterilize or autoclave the central charger.
- Use the central charger only in the specified circumstances in this manual.

Notes

- The central charger may be subject to local regulations regarding disposal. Contact your local authorities to determine the requirements for the recycling and disposal of electrical equipment and follow those requirements.
- This manual describes all features and options. Your equipment may not have all of them.
- Follow all of the instructions described in this manual.

Equipment Symbols

The following symbols may be found on the charger station or its accessories.

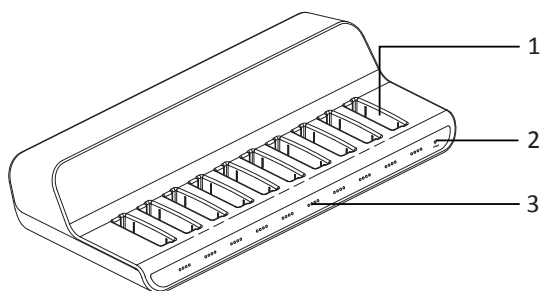
Symbol	Description
	Refer to instruction manual/booklet
	Serial number
	Date of Manufacture
	Alternating current
	Manufacturer

General Product Description

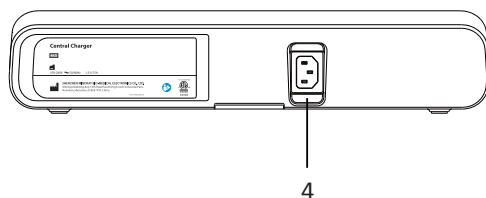
The central charger can charge 10 lithium-ion batteries simultaneously. It supports charging the following lithium-ion batteries:

- Lithium-ion batteries (P/N 022-000196-00) for TD60 telemetry transmitter and TM80 telemetry monitor
- Lithium-ion batteries (P/N 022-000198-00) for BP10 NIBP module

Front view



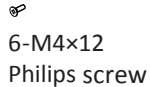
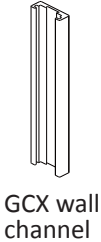
Rear view



1. Charging slot
2. AC power indicator:
Off: No AC power supply connected
Green: AC power supply is connected
3. LED indicators: indicates the charging status of the corresponding charging slot. Refer to section **Charging Status** for details.
4. AC power socket

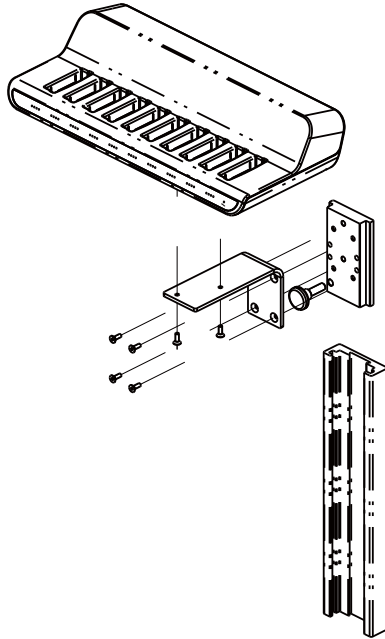
Wall Mount

Installation accessories



BeneVision central charger wall mount package (115-030109-00)	
Slide	0010-20-42769
stop knob	0010-20-42983
Bracket	042-012401-00
M4x12 Philips screw	M04-051053--

Mounting the Central Charger



1. Install the slide on the GCX wall channel and use the stop knob to secure the slide to the desired height as directed above.
2. Use two M4X12 Philips screws to secure the bracket on the central charger.
3. Use four M4X12 Philips screws to secure the bracket on the slide.
4. Loosen the stop knob to adjust the height of the central charger if necessary, and then lock the stop knob.

Charging Batteries

Cautions

- Risk of product damage. Ensure that the AC power supply voltage corresponds to the requirements printed on the AC power socket (or refer to the specifications).
- Make sure that there is no sign of damage on the central charger or batteries before use.
- Do not touch the metal contacts of the central charger or batteries. A broken contact will affect the power supply performance.
- Firmly plug the lithium-ion battery to the charger slot.

Notes

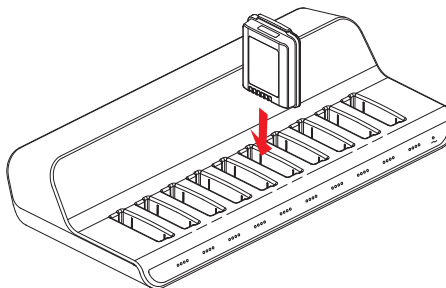
- After the battery is plugged into the central charger, wait for the corresponding LEDs to illuminate to ensure that charging starts.
- We recommend using the central charger at room temperature. The charging time may be prolonged in high or low temperature environment.
- Fully charge the batteries prior to use. For battery storage, we recommend recharging batteries to about 50% of their capacity every six months.

To charge the lithium-ion batteries, follow this procedure:

1. Connect the AC power cord to the AC socket on the central charger.
2. Plug the AC power cord into the AC power outlet.

The AC power indicator turns green.

3. Plug a battery in a charger slot, as shown in the following figure:



Charging Status

The charger slot LED indicators show the corresponding lithium-ion battery status. Each group of LED indicators consists of four dots. Each dot indicates 25% battery charge, and has three statuses as follows:

Dot	Status
○	Off
◐	Flash
●	On

The following table describes the battery charging status:

Status	Description
○○○○	No battery is plugged or the charging is abnormal.
◐○○○	The battery is being charged: battery charge < 25%.
●◐○○	The battery is being charged: 25% ≤ battery charge < 50%.
●●◐○	The battery is being charged: 50% ≤ battery charge < 75%.
●●●◐	The battery is being charged: battery charge ≥ 75%.
●●●●	The battery is full: battery charge > 95%.

Notes

- The LED dot shown in the manual is a sketch for reference only.
- When the central charger is connected to AC power for the first time, all LED indicators flash once. This flash indicates that the LED indicators are functioning properly.
- After the battery is plugged in the charger slot, the corresponding LED indicator flashes for up to four seconds. This flash indicates that the charger slot is ready to charge the battery.
- When the battery is removed from the charger slot, the corresponding LED indicator flashes once. This flash indicates that the charger slot is reset.

Removing Batteries

After the lithium-ion battery is fully charged, remove the battery from the charger slot. If the battery is not to be used for a prolonged period of time (for example, several weeks), store the battery in a cool, dry place.

Cleaning

Warning

- Be sure to shut off the AC power supply before cleaning the central charger.
- Avoid use of cleaners, materials or chemicals that may damage the central charger surfaces, labels, or cause device failures.
- Keep your central charger free of dust and dirt. To avoid damage to the central charger, follow these guidelines:
 - Always dilute according to the manufacturer's instructions or use lowest possible concentration.
 - Do not immerse any part of the device into liquid. Do not pour liquid onto the device.
 - Do not allow liquid to enter the device interior.
 - Never use abrasive materials (such as steel wool or silver polish), or erosive cleaners (such as acetone or acetone-based cleaners).

Cautions

- Discontinue using the central charger if liquid is spilled on the central charger or lithium-ion batteries. Dry the central charger or batteries.
- Do not disassemble the central charger or the lithium-ion battery. There are no internal user-serviceable parts.
- While cleaning, do not touch the metal contacts of the central charger or lithium-ion battery.

Recommended cleaning agents are:

- Water
- Mild soap

Check the central charger daily for signs of damage. Replace as required.

To clean the charger slot, follow this procedure:

1. Disconnect the central charger from the AC power.
2. Wipe the central charger using a soft cloth with mild soap and water solution.
3. Wipe off all the cleaning solution with a dry cloth after cleaning if necessary.
4. Allow the central charger to completely dry before using.

Storing

When storing the central charger, make sure that the metal contacts do not come into contact with other metallic objects.

Place the central charge in a cool dry place (ideally at 15 °C or 60 °F). Do not stack central chargers.

Troubleshooting

To maintain the warranty, never attempt to repair the central charger.

If you encounter problems when using the central charger, check the below table before contacting services. If the problems persist, contact your service personnel.

Problem	AC power indicator is off.
Possible solutions	<ol style="list-style-type: none">1. Connect AC power properly.2. Check if the AC power is available.3. Contact Mindray Technical Support.

Problem	After the lithium-ion battery is plugged in the charger slot, the corresponding LED indicator is still off
Possible solutions	<ol style="list-style-type: none">1. Pull the battery from the charger slot, and then re-plug the battery to the end of the charger slot.2. Remove the battery from the current charger slot. Try to use other charger slots.3. Contact Mindray Technical Support.

Specification

Notes

- The specification is subject to change without prior notice.

The central charger is powered by AC power.

General Information	
Type of protection against electrical shock	Class I
Degree of protection against harmful ingress of water	IPX0
Input voltage	100 VAC to 240 VAC ($\pm 10\%$)
Frequency	50 Hz/60 Hz (± 3 Hz)
Input current	1.5 A to 0.75 A
Charging time	At the room temperature: ≤ 5 hours
Overcharge protection function	The charger automatically stops charging when the lithium-ion battery charge is full.
Weight	1.13 kg (without batteries)
Size	365 mm x 171 mm x 78 mm (without batteries)

Environmental Requirements	
Operating temperature	0°C to 40 °C
Operating humidity	15% to 95%, non-condensation
Operating barometric pressure	427.5 mmHg to 805.5 mmHg (57.0 kPa to 107.4 kPa)
Storage temperature	-20 °C to 60 °C
Storage humidity	10 to 95%, non-condensation
Storage barometric pressure	120 mmHg to 805.5 mmHg (16.0 kPa to 107.4 kPa)

EMC Specifications

The device meets the requirements of IEC 60601-1-2.

Notes

- Using cables other than those specified may result in increased electromagnetic emission or decreased electromagnetic immunity of the equipment.

Notes

- The device or its components should not be used adjacent to or stacked with other equipment. If adjacent or stacked use is necessary, the device or its components should be observed to verify normal operation in the configuration in which it will be used.
- The device needs special precautions regarding EMC and needs to be installed and put into service according to the EMC information provided below.
- Other devices may interfere with this device even though they meet the requirements of CISPR.
- When the inputted signal is below the minimum amplitude provided in technical specifications, erroneous measurements could result.
- Portable and mobile communication equipment may affect the performance of this device.
- Other devices that have an RF transmitter or source may affect this device (e.g. cell phones, PDAs, and PCs with wireless function).

Guidance and Declaration - Electromagnetic Emissions

The device is intended for use in the electromagnetic environment specified below. The customer or the user of the device should assure that it is used in such an environment.

Emission tests	Compliance	Electromagnetic environment - guidance
Radio frequency (RF) emissions CISPR 11	Group 1	The device uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emissions CISPR 11	Class A	The device is suitable for use in all establishments other than domestic and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic emissions IEC 61000-3-2	Class A	
Voltage Fluctuations/Flicker Emissions IEC 61000-3-3	Complies	

If the system is operated within the electromagnetic environment listed in Table "Guidance and declaration — electromagnetic immunity", the system will remain safe and provide the following essential performance

- Operating mode
- Battery identification
- Charge

Warning


- This equipment/system is intended for use by healthcare professionals only. This equipment/ system may cause radio interference or may disrupt the operation of nearby equipment. It may be necessary to take mitigation measures, such as re-orienting or relocating the [ME EQUIPMENT or ME SYSTEM] or shielding the location.

Guidance and Declaration - Electromagnetic Immunity			
The device is intended for use in the electromagnetic environment specified below. The customer or the user of the device should assure that it is used in such an environment.			
Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment - guidance
Electrostatic discharge (ESD) IEC 61000-4-2	±6 kV contact ±8 kV air	±6 kV contact ±8 kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
Electrical fast transient/burst IEC 61000-4-4	±2 kV for power supply lines ±1 kV for input/output lines	±2 kV for power supply lines ±1 kV for input/output lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	±1 kV line(s) to line(s) ±2 kV line(s) to earth	±1 kV line(s) to line(s) ±2 kV line(s) to earth	

Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment - guidance
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	<p><5 % U_T (>95 % dip in U_T) for 0.5 cycle</p> <p>40 % U_T (60 % dip in U_T) for 5 cycles</p> <p>70 % U_T (30 % dip in U_T) for 25 cycles</p> <p><5 % U_T (>95 % dip in U_T) for 5 s</p>	<p><5 % U_T (>95 % dip in U_T) for 0.5 cycle</p> <p>40 % U_T (60 % dip in U_T) for 5 cycles</p> <p>70 % U_T (30 % dip in U_T) for 25 cycles</p> <p><5 % U_T (>95 % dip in U_T) for 5 s</p>	Mains power quality should be that of a typical commercial or hospital environment. If the user of the product requires continued operation during power mains interruptions, it is recommended that it be powered from an uninterruptible power supply or a battery.
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.

Note: U_T is the AC mains voltage prior to application of the test level.

Guidance and Declaration - Electromagnetic Immunity			
The device is intended for use in the specified electromagnetic environment. The customer or the user of the device should assure that it is used in such an environment as described below.			
Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment - guidance
Conducted RF IEC61000-4-6	<p>3 Vrms</p> <p>150 kHz to 80 MHz</p>	3Vrms	<p>Portable and mobile RF communications equipment should be used no closer to any part of the system, including cables, than the recommended separation distance calculated from the equation appropriate for the frequency of the transmitter. Recommended separation distances:</p> $d = 1.2\sqrt{P}$

Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment - guidance
Radiated RF IEC 61000-4-3	3 V/m 80 MHz to 2.5 GHz	3 V/m	<p>Recommended separation distances:</p> <p>80 MHz to 800 MHz</p> $d = 1.2\sqrt{P}$ <p>800 MHz to 2.5 GHz</p> $d = 2.3\sqrt{P}$ <p>Where, P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in meters (m).</p> <p>Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey^a, should be less than the compliance level in each frequency range^b.</p> <p>Interference may occur in the vicinity of equipment marked with the following symbol:</p> 
<p>Note 1: At 80 MHz to 800 MHz, the separation distance for the higher frequency range applies.</p>			
<p>Note 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.</p>			
<p>^a Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcasts and TV broadcasts cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the [ME EQUIPMENT or ME SYSTEM] is used exceeds the applicable RF compliance level above, the [ME EQUIPMENT or ME SYSTEM] should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the [ME EQUIPMENT or ME SYSTEM].</p> <p>^b Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.</p>			

Recommended separation distances between portable and mobile RF communications equipment and the device

The device is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the device can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the device as recommended below, according to the maximum output power of the communications equipment.

Rated maximum output power of transmitter (W)	Separation distance in meters (m) according to frequency of the transmitter		
	150 kHz to 80 MHz	80 MHz to 800 MHz	800 MHz to 2.5 GHz
	$d = 1.2\sqrt{P}$	$d = 1.2\sqrt{P}$	$d = 2.3\sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.38	0.38	0.73
1	1.20	1.20	2.30
10	3.80	3.80	7.30
100	12.00	12.00	23.00

For transmitters rated at a maximum output power not listed above, the recommended separation distance d in metres (m) can be estimated using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

Note 1: At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.

Note 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

Company Contact

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