
ChargeXpress PRO 50-2



INSTRUCTION MANUAL

CONTENTS

Safety Guidelines	5
General Safety Precautions	5
Personal Precautions	5
Preparing To Charge The Battery	6
Grounding & Power Cord Connections	6
Charger Location	7
DC Connection Precautions	7
Installing The Battery	7
Removing the Battery	8
Safety Reminder	8
Safety Precautions	8
Chapter 1: Before You Begin	9
Chapter 2: Specifications	10
General	10
Input Ratings	10
Output Ratings	10
Chapter 3: Getting Started	11
Fitting Installations	11
Visual Inspection	11
Front Panel	12
1. Function LED	12
2. Multi Function and POWER buttons	12
3. Status LED's	12
Chapter 4: Charging	13
Charge Sequence	13
Power Supply Mode	13
24V Charging (Truck Systems)	13
ChargeXpress PRO Operating Steps	13
1. Connect ChargeXpress PRO to Battery	13
2. Connect to Power AC	13
3. Select ChargeXpress PRO Modes	13
ChargeXpress PRO FUNCTIONS	13
Chapter 5: Troubleshooting	14
Operation	14
Error Codes	14

This page intentionally left blank.

Safety Guidelines

General Safety Precautions

1. IMPORTANT SAFETY INSTRUCTIONS. **IT IS OF UTMOST IMPORTANCE THAT BEFORE USING YOUR CHARGER, YOU READ THIS MANUAL AND FOLLOW THE SAFETY AND OPERATING INSTRUCTIONS EXACTLY.** SAVE THESE INSTRUCTIONS.

CAUTION

Risk of explosive gases

Batteries generate explosive gases during normal operation, and when discharged or charged.

- 1.1 To reduce risk of battery explosion, follow these safety instructions and those published by the battery manufacturer and the manufacturer of any equipment you intend to use in the vicinity of a battery. Review cautionary marking on these products and on the engine, and on the vehicle or equipment containing the battery.

CAUTION

Charging a non-rechargeable battery may cause the battery to burst.

To reduce the risk of injury, only charge rechargeable lead-acid type batteries including maintenance-free, low-maintenance, or deep-cycle batteries.

If you are uncertain as to the type of battery you are attempting to charge, or the correct procedure for checking the battery's state of charge, contact the seller or battery manufacturer.

- 1.2 Use of an attachment not recommended or sold by the battery charger manufacturer may result in a risk of fire, electric shock, or injury to persons.
- 1.3 To reduce risk of damage to the electric plug and cord, pull by the plug rather than by the cord when disconnecting the charger.
- 1.4 Position the AC and DC leads to avoid tripping over them and to prevent damage by hood, doors, or moving engine parts; protect from heat, oil, and sharp edges.
- 1.5 Do not operate the charger if it has received a sharp blow, been dropped or otherwise damaged in any way; take it to a qualified service center.
- 1.6 Do not disassemble charger; take it to a qualified service center when repair is required. Incorrect reassembly may result in a risk of electric shock or fire.
- 1.7 To reduce risk of electric shock, unplug the charger from the AC outlet before attempting any maintenance or cleaning. Turning off the controls will not reduce this risk.

CAUTION

Remove marine "boat" batteries and charge them on shore.

Charging marine batteries on-board requires specially designed equipment for marine use.

- 1.8 Connect and disconnect the battery leads only when the AC supply cord is disconnected.
- 1.9 Do not overcharge the battery.
- 1.10 Charge the battery in a dry, well-ventilated area.
- 1.11 Never place articles on or around the charger, or locate the charger in a way that will restrict the flow of cooling air through the cabinet.
- 1.12 An extension cord should not be used unless absolutely necessary. (See paragraph 4.3.)
- 1.13 Have a damaged cord or plug replaced immediately.
- 1.14 Do not expose the charger to rain or snow.

Personal Precautions

- 2.1 Always have someone within range of your voice, or close enough to come to your aid, when working around lead acid batteries.
- 2.2 Have plenty of fresh water and soap nearby in case battery acid contacts skin, clothing or eyes.
- 2.3 Wear complete eye protection, clothing protection, and wear rubber soled shoes. Place damp cloth over battery to protect against acid spray. When ground is very wet or covered with snow, wear rubber boots. Avoid touching eyes while working near battery.
- 2.4 If battery acid contacts skin or clothing, wash immediately with soap and water. If acid enters the eye, immediately flush with cold running water for at least 10 minutes, and seek medical attention.
- 2.5 NEVER smoke or allow a spark or flame in vicinity of a battery or engine.
- 2.6 Be extra cautious to reduce risk of dropping a metal tool onto the battery. It might spark or short circuit the battery or other electrical part that may cause an explosion.
- 2.7 Before working with a lead-acid battery, remove personal metal items such as rings, bracelets, necklaces, watches, etc. A lead-acid battery can produce a short circuit current high enough to weld such items causing a severe burn.

CAUTION

Non-rechargeable batteries may burst when charging causing personal injury and damage.

To avoid electrical shock or burn, never alter the charger's original AC cord and plug. Disconnect plug from outlet when charger is idle.

The charger is not intended to supply power to a low-voltage electrical system other than applications using rechargeable, lead-acid type batteries. Do not use the battery charger for charging dry-cell batteries commonly used with home appliances. These batteries may burst and cause personal injury and property damage.

- 2.8 NEVER charge a frozen battery; thaw it out first.

Preparing To Charge The Battery

- 3.1 If it is necessary to remove the battery from vehicle to charge it, always remove the grounded terminal from the battery first. Make sure all accessories in the vehicle are off, so as not to cause an arc.
- 3.2 Be sure the area around the battery is well ventilated while the battery is being charged. Gas can be forcefully blown away by using a piece of cardboard or other non-metallic material as a fan.
- 3.3 Clean the battery terminals. Be careful to keep corrosion from coming into contact with your eyes.
- 3.4 Add distilled water in each cell until the battery acid reaches the level specified by the manufacturer. This helps purge excessive gas from the cells. Do not overfill. For a battery without caps, carefully follow the manufacturer's recharging instructions
- 3.5 Study all battery manufacturer's specific precautions such as removing or not removing cell caps while charging and recommended rates of charge.
- 3.6 Determine the voltage of the battery by referring to the car owner's manual and make sure that the output voltage selector switch is set at the correct voltage. If the charger has an adjustable charge rate, charge the battery initially at lowest rate. If the charger has only one voltage, verify that the battery voltage matches the voltage of charger.

For a charger not having an output voltage selector switch, determine the voltage of the battery by referring to car owner's manual and make sure it matches the output rating of the battery charger.

Grounding & Power Cord Connections

- 4.1 The **charger must be grounded** to reduce risk of electric shock. The charger is equipped with an electric cord having an equipment grounding conductor and a grounding plug. The plug must be plugged into an outlet that is properly installed and grounded in accordance with all local codes and ordinances.

DANGER



Hazardous voltage. An improper connection can result in electric shock

To avoid electrical shock or burn, never alter the charger's original AC cord and plug. Disconnect plug from outlet when charger is idle.

IF THE PLUG DOES NOT FIT THE OUTLET, HAVE A PROPER OUTLET INSTALLED BY A QUALIFIED ELECTRICIAN.

- 4.2 This battery charger is for use on a nominal 230-volt circuit.

DANGER



Hazardous voltage. An improper connection can result in electric shock

Before using an adapter be certain the center screw of the outlet plate is grounded. The rigid ear or lug extending from the adapter must be connected to a properly grounded outlet. Make certain it is grounded. If necessary, replace the original screw that secures the adapter ear or lug to the cover plate and make the ground connection to the grounded outlet.

- 4.3 An extension cord should not be used unless absolutely necessary. Use of an improper extension cord could result in a risk of fire and electric shock. If an extension cord must be used, make sure:
 - a. that the pins on plugs of the extension cord are the same number, size, and shape as those of the plug on the charger;
 - b. that the extension cord is properly wired and in good electrical condition;
 - c. that the wire size is large enough for the AC ampere rating of charger.

Recommended minimum AWG* size for extension cords for battery chargers					
AC input rating amperes		AWG* size of cord (mm ²)			
Equal or greater than:	But less than:	Length of cord, feet (m)			
		25 (7.6)	50 (15.2)	100 (30.5)	150 (45.6)
8	10	18 (0.75)	14 (2.5)	12 (4)	10 (6)
10	12	16 (1.5)	14 (2.5)	10 (6)	8 (10)
12	14	16 (1.5)	12 (4)	10 (6)	8 (10)
14	16	16 (1.5)	12 (4)	10 (6)	8 (10)
16	18	14 (2.5)	12 (4)	8 (10)	8 (10)

*American Wire Gauge

Charger Location

- 5.1 Locate the charger as far away from the battery as the charger cables permit.
- 5.2 Never place the charger directly above the battery being charged; gases from the battery will corrode and damage the charger.
- 5.3 Never allow battery acid to drip on the charger when taking gravity readings or filling a battery.
- 5.4 Operate the charger only in a well-ventilated area that is free of dangerous vapors.
- 5.5 Store the charger in safe, dry location and maintain it in perfect condition.
- 5.6 Do not set the battery on top of the charger or where its acid might drip onto the charger.

DC Connection Precautions

- 6.1 All switches should be set in the OFF position and AC cord should be DISCONNECTED from electrical outlet before you connect and disconnect the charger clamps to the battery. Never allow the clamps to touch each other.
- 6.2 When connecting the charger clamps to the battery, be certain to make the best possible mechanical as well as electrical connection. This will tend to prevent the clamps from slipping off the connections, avoid dangerous sparking, and assure safer and more efficient charging. The clamps should be kept clean.

⚠ DANGER



**Hazardous voltage.
Can cause death or serious personal injury.**

Setting the switches to "OFF" does not always disconnect the charger electrical circuit from the AC power cord or the DC charger clamps.

Installing The Battery

⚠ CAUTION

Risk of explosive gases.
A spark near the battery may cause a battery explosion. Follow these steps when the battery is installed in the vehicle to reduce the risk of explosion.

- 7.1 Before working on the vehicle, firmly apply the emergency brake and place the gear shift to NEUTRAL—shift an automatic transmission to PARK.
- 7.2 Locate the charger as far away from the battery as the charger cords permit and position the AC and DC cords to avoid stepping on or tripping over them and to prevent damage by hood, doors, or moving engine parts.
- 7.3 Stay clear of fan blades, belts, pulleys, and any other parts that can cause physical injury.
- 7.4 Turn **OFF** all vehicle loads, including door lights, and correct any defects in the vehicle's electrical system that may have caused low battery.
- 7.5 Check the polarity of the battery posts. The **POSITIVE (POS., P, +)** post usually has a larger diameter than the **NEGATIVE (NEG., N,-)** post.
- 7.6 Determine which post of the battery is grounded (connected) to the chassis. If the negative post is grounded (as in most vehicles), see paragraph 7.7. If the positive post is grounded, see paragraph 7.8.
- 7.7 For a negative-grounded vehicle, first connect the **POSITIVE (RED)** clamp from the charger to the **POSITIVE (POS., P, +)** ungrounded post of the battery. Then connect the **NEGATIVE (BLACK)** clamp to the **NEGATIVE (NEG., N,-)** post of the battery. Do not connect the clamp to the carburetor, fuel lines, or sheet-metal body parts. When disconnecting the charger, turn all switches to **OFF**, disconnect the AC cord, remove the clamp from the **NEGATIVE** battery terminal, and then remove the clamp from the **POSITIVE** battery terminal.

- 7.8 For positive-grounded vehicle, connect the **NEGATIVE (BLACK)** clamp from the charger to the **NEGATIVE (NEG., N, -)** ungrounded post of battery. Then connect the **POSITIVE (RED)** clamp to the **POSITIVE (POS., P, +)** post of the battery. Do not connect clamp to carburetor, fuel lines, or sheet-metal body parts.

When disconnecting the charger, turn the switches to **OFF**, disconnect the AC cord, remove the clamp from the **POSITIVE** battery terminal, and then remove the clamp from the **NEGATIVE** battery terminal.

CAUTION: WHEN POSITIVE (+) POST OF VEHICLE BATTERY IS GROUNDED, DOUBLE CHECK POLARITY.

Removing the Battery

8. If it is necessary to remove the battery from the vehicle or equipment, always remove the grounded terminal from the battery first.

⚠ CAUTION

Risk of explosive gases.
A spark near the battery may cause a battery explosion. Follow these steps when the battery is installed in the vehicle to reduce the risk of explosion.

⚠ CAUTION

Risk of explosive gases.
Make sure all vehicle loads are **OFF** to prevent a possible arc.

- 8.1 Check the polarity of battery posts. **POSITIVE (POS., P, +)** post usually has larger diameter than **NEGATIVE (NEG., N, -)** post.
- 8.2 Attach at least a 60 cm (24-inch), 6-gauge insulated battery cable to the negative (-) battery terminal.
- 8.3 Connect the **POSITIVE (RED)** charger clamp to the **POSITIVE (POS., P, +)** post of battery.
- 8.4 Position yourself and the free end of cable as far away from the battery as possible—do not face the battery when making the final connection—then connect the **NEGATIVE (BLACK)** charger clamp to the free end of the cable.
- 8.5 When disconnecting the charger, always do so in the reverse sequence of the connecting procedure; break the first connection while staying as far away from the battery as practical.

Safety Reminder

For safe, efficient, and accurate charging and testing, review the safety and operating instructions in this manual before using the analyzer. In addition, follow all manufacturers' instructions and BCI (Battery Council International) safety recommendations.

Safety Precautions

Inspect the battery for damages and check the electrolyte level. If the electrolyte level is too low, replenish it and fully charge the battery. Always use the necessary safety precautions when working with batteries to prevent severe injury or death. Follow all manufacturers' instructions and BCI (Battery Council International) safety recommendations.

- ☒ Battery acid is highly corrosive. If acid enters your eyes, immediately flush them thoroughly with cold running water for at least 15 minutes and seek medical attention. If battery acid gets on your skin or clothing, wash immediately with a mixture of water and baking soda.
- ☒ Always wear your PPE: proper gloves, rubber apron, safety glasses or face shield when working with or around batteries.
- ☒ Keep hair, hands, and clothing as well as the analyzer cords and cables away from moving engine parts.
- ☒ Remove any jewelry or watches before you start servicing the battery.
- ☒ Use caution when working with metallic tools to prevent sparks or short circuits.
- ☒ Never lean over a battery when testing, charging, or jump starting.
- ☒ Never charge a frozen battery. Gases may form, cracking the case, and spray out battery acid.

Chapter 1: Before You Begin

Disposal

Do not dispose of this device with normal domestic waste!

To comply with the European Directive 2002/96/EC on Waste Electrical and Electronic Equipment and its implementation as national law, electrical equipment that has reached the end of its life must be collected separately and returned to an approved recycling facility. Any device that you no longer require must be returned to our agent, or find out about the approved collection and recycling facilities in your area. Ignoring this European Directive may have potentially adverse effects on the environment and your health! Please be aware that in other parts of the world local legislation should be followed.

Conventions used in this manual

To help you learn how to use your charger the manual uses these symbols and typographical conventions:

Convention	Description
	The safety symbol indicates instructions for avoiding hazardous conditions and personal injury.
	The safety symbol with the words CAUTION , WARNING , or DANGER indicates instructions for avoiding hazardous conditions and personal injury.
CAUTION	The word CAUTION indicates instructions for avoiding equipment damage.
	The wrench symbol indicates procedural notes and helpful information.
UP ARROW	The text for keypad buttons are in Bold capital letters.
CAPITAL LETTERS	The text for screen options are in regular capital letters.
BACK ARROW	The text for soft keys are in Bold capital letters.

Chapter 2: Specifications

General

Lead-acid batteries	GEL, AGM/SPIRAL, Flooded, Power supply
Number of cells	6
Rated capacity	20 to 250Ah

Note: A 24 V operation consists of two 12 V (6cell) batteries connected in series.

Input Ratings

230 V AC (16A) 50 / 60Hz

(Tolerance: 190 - 265 V AC 50 / 60Hz)

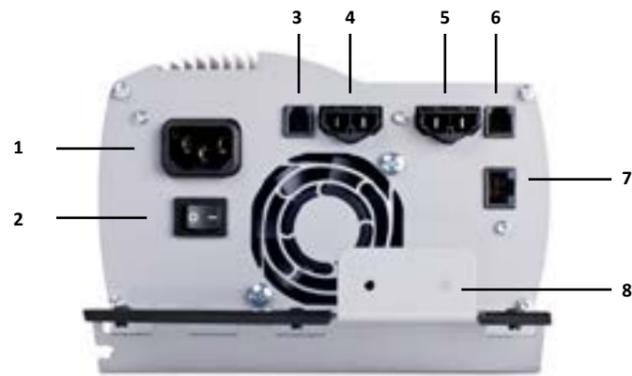
Output Ratings

Charger	DC Voltage	Amps	Watts
PRO 50	12 V	50 A single channel 2x 25 A dual channel	660

Chapter 3: Getting Started

Before connecting the unit to the mains please connect the charge cables to the unit. Charge cable #1 goes into position 4, charge cable #2 goes into position 5. Make sure the charge cables are connected nice and tidy under the strain relieve shown in position 8 using the bracket with the wing nut. Plug in the AC power cable at position 1.

1. AC power cable
2. ON / OFF switch
3. Volt sensing connector 1
4. Charge cable 1
5. Charge cable 2
6. Volt sensing connector 2
7. Programming connector
8. Strain relief



Fitting Installations

The charger can be mounted vertically or horizontally, while maintaining a free area of 15 cm (6") all around. This allows an optimal cooling with air circulation.

Visual Inspection

Visually inspect the battery before charging. If there are any signs of a leaking or cracked case, discard the battery. Do not attempt to charge a battery that is in this condition.

PLEASE BE AWARE THAT THIS PLUG IS FOR PROGRAMMING ONLY. PLUGGING ANY OTHER CABLE MAY CAUSE DAMAGE TO THE CHARGEEXPRESS PRO.



Front Panel

1. Function selection LED's
2. Multi Function and POWER buttons
3. Status LED's

1. Function LED

Each charger channel has 4 LEDs to indicate the selected function. A blinking LED indicates a fault, see therefore the code table.

2. Multi Function and POWER buttons

Charger is OFF

Holding the POWER button for four seconds turns the power on. A self test is performed by the charger, if everything is OK both status LEDs will turn to green. If LEDs don't turn green, check the error code under the Trouble codes section in this manual.

With the charger switched ON press the Multi function buttons consequently to scroll through the available battery technologies. When the button is no longer pressed, the charger automatically accepts this selection.

Charger is now ready to charge a battery.

Charger is ON

Pressing the Multi Function POWER button quickly (less than 1 second) stops the battery charger, if active. When Multi Function and POWER button is pressed for more than 2 seconds the charger switches completely off.

3. Status LED's

Located at the bottom of the charger are two multi coloured LEDs. Each charger channel has one LED assigned. When the charger is switched on a self-test is performed. If something is not according to specification the multi coloured LED will turn RED.

Possible colours:

Green

- Indicates charger is OK, when the charger is not actively charging a battery
- Continuous; fully charged battery

Red

- Solid Red LED. Charger internals are not OK.
- Blinking RED LED Blink rate indicates a fault. Count the blink rate and check trouble- shooting section for more details.

Orange:

- Solid lit LED indicates that battery is being charged.



Chapter 4: Charging

Charge Sequence

Select a battery technology to ensure that the battery is properly charged. To select any of the 4 positions press the Multi Function and POWER button quickly. The top LED (lead-acid) starts blinking. Pushing the Multi Function and POWER button again within 4 seconds will scroll to the next selection. This can be continued until the proper selection is made. When the button is no longer pressed, the LED will turn solid green indicating that that selection is activated. With the charger clamps connected to a battery the LED will turn to solid orange and starts charging.

The Multi Function and POWER button can be pressed at any time during a charge cycle to stop the charger.

Position:

1. Lead Acid charge curve
2. AGM / SPIRAL charge curve
3. GEL charge curve

Power Supply Mode

Integrated in the charger is also a Power Supply function. This mode ensured that the battery is kept fully charged during programming of ECU's or regular vehicle maintenance.

When the charger is not yet switched on, press and hold down one of the Multi Function and POWER buttons for more than two seconds. The unit will perform a self-test and the green STATUS LED's will light up to indicate charger is ready and OK. In case of a problem the red LED will be lit. This red LED is also used to indicate any error code in the charger. The LED will blink at a certain rate.

To select the Power Supply Mode press any of the two Multi Function and POWER buttons shortly until position 4 is reached. The LED will now turn to solid green. With the charger clamps connected to a battery the LED will turn to solid orange to indicate that it is in progress.

Any consumer in the vehicle that needs current will get this from the charger. Only then, when current is needed in the vehicle the charger will provide this, in any other situation no current flows.

Position:

4. Power Supply Mode

24V Charging (Truck Systems)

The charger is capable of charging 24V battery systems without removing the bridge in between both batteries.

- Connect charger clamps 1 to battery one
- Connect charger clamps 2 to battery two
- Switch on the charger and activate both charger channels
- Select the battery technology for the battery set

The batteries will each be charged with 25A simultaneously.

ChargeXpress PRO Operating Steps

IMPORTANT NOTES

- Clean the battery terminals. If stud adapters are required, fasten them with the proper tool. Do not use the battery clamps to tighten adapters.
- Use stud adapters on Side-Post and/or Truck batteries that are not in the vehicle.
- Never remove the clamps from a battery to abort an active charging session. Always push the Multi Function and POWER button shortly before removing the clamps.
- Do not leave clamps lying in battery acid.
- Clean up any acid spills immediately (e.g., with baking soda and water).
- Clamps must be cleaned after every use.

1. Connect ChargeXpress PRO to Battery

Connect the ChargeXpress PRO charging clamps to the battery in accordance with all precautions and safety instructions.

Note: If you accidentally reverse the clamp connections, the ChargeXpress PRO will indicate this with a red led and blink rate (01). switch charger off before changing clamps.

2. Connect to Power AC

Plug the ChargeXpress PRO into a dedicated, grounded 16 Amp AC outlet. Do not use an AC line cord adapter or extension cord. Switch on the charger.

3. Select ChargeXpress PRO Modes

Use the Multi Function and POWER button to activate charger and selecting the battery technology used for charging the battery:

Lead acid, AGM/SPIRAL, GEL, or Power supply

After selecting one of the modes the charger will start charging automatically. This is indicated by the Orange LED.

ChargeXpress PRO Functions

To charge the different battery technologies use the Multi Function and POWER button to select one of the following:

Battery Technology	U Boost	U Float
Flooded Lead acid; Calcium, Antimony	16,50 / 14,20	Pulse 13,5 – 14,8
AGM / SPIRAL	16,50 / 14,40	Pulse 13,5 – 14,8
GEL	16,50 / 14,30	Pulse 13,5 – 14,8
Power Supply	N/a	13,10

Chapter 5: Troubleshooting

Operation

The Multi Function and POWER button is pressed, but the ChargeXpress PRO does not power-up.

- a. Make sure the AC power cord is completely inserted into the AC outlet.
- b. Make sure the ChargeXpress PRO is turned ON
- c. Make sure the AC outlet is live (check fuse or circuit breaker).
- d. Check the AC power cord for damage.

Error Codes

Through the red STATUS LED's error codes can be transmitted, the selected green function LED will blink with the same frequency.

Error code	Description	Action
01	Reverse polarity	Correct clamps, red to plus and black to minus pole
02	Connection problem	Correct connection and restart charge sequence
03	Non 12V battery connected	Connect correctly to 12 V
04	Battery voltage too low (< 5,5 V)	Battery deeply discharged, consider replacement battery might be damaged
05	Charge voltage problem, no increase	Consider battery replacement
06	Charge current problem, no increase	Battery replacement recommended
07	Too low charge current	Battery replacement recommended
08	Internal current failure	Switch off unit (press ON/OFF button for 2 seconds) and try again. If problem is consistent call for service.
09	Internal voltage failure	
10	Internal charger temperature too high	Switch off unit (press ON/OFF button for 2 seconds). Switch on again and leave the fan running. If fan is not running call for service.

The charger will display any error in the charger as a blink code. The blink rate is:



Sample: this blink rate means error code 3 (non 12V battery connected)

PATENTS

The ChargeXpress PRO 50-2 is made by Midtronics, Inc., and is protected by one or more U.S. and foreign patents. For specific patent information, contact Midtronics, Inc. at +1 630 323-2800.

LIMITED WARRANTY

This battery charger is warranted to be free of defects in materials and workmanship for a period of one (1) year from date of purchase. Midtronics will, at our option, repair the unit or replace the unit with a remanufactured charger. This limited warranty applies only to Midtronics battery charger and does not cover any other equipment, wear and tear parts such as the cable, static damage, water damage, over-voltage, dropping the unit or damage resulting from extraneous causes including owner misuse. Midtronics is not liable for any incidental or consequential damages for breach of this warranty. The warranty is void if owner attempts to disassemble the unit, or to modify the cable assembly.