EPOCH BATTERIES

USER MANUAL | ECO SERIES DEEP-CYCLE LIFEPO4 BATTERY

12V 100Ah Eco Series LiFePO4 Battery

Model / SKU: 12100-ECO

Eco Series | Deep Cycle | Low-Temperature Charge Protection | Group 24 | IP54

Product photo shown for identification. Actual labels, accessories, and supplied hardware may vary by production revision.

Nominal Voltage	12.8V
Capacity	100Ah
Stored Energy	1.28kWh
Continuous Output	100A
Peak Current	300A @ 5 seconds

Revised: 2026-06-20

Read this manual completely before installing, charging, operating, storing, or servicing the battery.

Legal Provisions and Important Notice

Purpose and importance of this manual

This manual provides instructions for safe handling, installation, charging, operation, storage, maintenance, troubleshooting, and warranty support for the Epoch 12100-ECO Eco Series LiFePO4 battery. It is intended to help users and installers reduce risk, protect connected equipment, and obtain reliable battery performance.

Qualified installation

Battery systems can deliver very high current. Installation and service should be performed by persons who understand DC electrical systems, lithium battery charging, overcurrent protection, conductor sizing, terminal torque, and safe work practices. When the installation is part of a boat, RV, vehicle, trailer, cabin, or building system, comply with all applicable codes and equipment manufacturer requirements.

Product changes

Specifications, accessories, firmware, labels, and documentation may change without notice. Use the latest Epoch Batteries documentation and product labeling for installation, operation, and service.

Warranty and compliance

Failure to follow this manual, using incompatible chargers or accessories, modifying the battery, improper installation, abuse, water intrusion beyond the product rating, incorrect polarity, overcurrent events, or operation outside specified limits may void warranty coverage and may create safety hazards.

> **WARNING:** Incorrect installation or use can cause fire, electric shock, severe injury, death, or damage to the battery and connected equipment. Stop and contact Epoch Batteries support if any instruction is unclear.

Safety Signal Words

This manual uses the following signal words to identify the severity of a hazard or instruction.

DANGER	Indicates a hazardous situation that, if not avoided, will result in death or serious injury.
WARNING	Indicates a hazardous situation that, if not avoided, could result in death or serious injury.
CAUTION	Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.
NOTICE	Indicates practices that can damage the battery, connected equipment, or property.

General safety rules

- Read all instructions before use.
- Keep the battery away from children and pets.
- Do not open, drill, crush, puncture, drop, burn, or modify the battery.
- Do not short the terminals or allow tools, jewelry, or conductive objects to bridge the terminals.
- Use insulated tools and appropriate personal protective equipment.
- Confirm polarity before connecting chargers, loads, DC-to-DC chargers, solar controllers, inverters, or series/parallel wiring.
- Stop using the battery immediately if it becomes unusually hot, emits odor, smokes, leaks, swells, makes unusual sounds, or is physically damaged.

DANGER: Do not connect the positive and negative terminals together. A short circuit can release extremely high current and may cause arcing, burns, fire, or equipment damage.

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1. Introduction

Thank you for choosing Epoch Batteries. The Epoch 12100-ECO is a 12.8V, 100Ah, 1.28kWh Eco Series LiFePO4 battery designed for compact 12V deep-cycle energy systems.

This manual explains how to use the battery safely in RV, marine house-power, solar, off-grid, backup, van, camper, travel trailer, trolling motor auxiliary, and other 12V applications where the system requirements match the battery specifications.

Who should use this manual

- End users who need basic safety, charging, monitoring, and storage guidance.
- Installers who need model-specific electrical limits, terminal information, and battery bank considerations.
- Dealers, support teams, and service technicians who need a consistent troubleshooting and warranty reference.

Important compatibility note

The 12100-ECO is a lithium deep-cycle battery and is not a drop-in replacement for every lead-acid installation. Before installation, verify Group 24 tray fitment, terminal clearance, cable size, overcurrent protection, charger profile, charging source compatibility, and load requirements.

> **NOTICE:** This model is designed as a deep-cycle LiFePO4 battery. For engine starting or cranking applications, use a cranking-rated battery or confirm system compatibility directly with Epoch before installation.

2. Product Overview

The Epoch 12100-ECO combines LiFePO4 chemistry, low-temperature charge protection, advanced BMS protection, IP54 weather resistance, and a compact Group 24 footprint for everyday 12V deep-cycle applications.

Primary uses

- RV, camper, travel trailer, and motorhome 12V house-power systems.
- Van, overland, and mobile auxiliary power systems.
- Marine house battery systems for electronics and accessories, within current limits.
- Solar charge controller, inverter charger, converter, and DC-to-DC charging systems programmed for LiFePO4.
- Backup power for compatible 12V equipment and compact energy-storage systems.
- 12V trolling motor and auxiliary applications where voltage, current, space, and mounting requirements match.

Key features

LiFePO4 chemistry	Stable lithium iron phosphate chemistry for long cycle life and reliable deep-cycle operation.
100Ah capacity	Stores approximately 1.28kWh of energy in a compact Group 24 footprint.
Low-temperature charge protection	Built-in protection prevents charging outside the specified low-temperature limit.
Advanced BMS	Helps protect against overcharge, over-discharge, over-current, short circuit, and temperature extremes.
IP54 enclosure	Dust-protected and splash-resistant for everyday mobile, RV, marine house-power, and outdoor use; not submersible.
Series/parallel expansion	Supports up to 4 batteries in series and up to 16 batteries in parallel, using matched batteries.
Maintenance-free	No watering, acid maintenance, or routine lead-acid service required.

NOTICE: This Eco Series model does not include Bluetooth monitoring or self-heating. Use external system monitoring and charge only within the specified charge temperature range.

NOTICE: IP54 weather resistance does not mean waterproof. Do not submerge, pressure wash, or install the battery where standing water can collect around the case or terminals.

3. Specifications

General and electrical specifications

Brand	Epoch Batteries
Model / SKU	12100-ECO
Series	Eco Series
Battery Type	Deep-cycle LiFePO4 battery

Battery Group Size	Group 24
Chemistry	LiFePO4 / lithium iron phosphate
Cell Type	Prismatic LiFePO4
Cell Configuration	4S1P
Nominal Voltage	12.8V
Nominal Capacity	100Ah
Stored Energy	1.28kWh / 1,280Wh
Operating Voltage Range	10.0V to 14.6V
Maximum Charge Voltage	14.6V
Bluetooth	No
Self-Heating	No
Low-Temperature Charge Protection	Yes

Current, temperature, and mechanical specifications

Max Continuous Discharge	100A
Maximum Discharge Current	200A
Max Continuous Charge Current	100A
Max Discharge Peak Current	300A @ 5 seconds
Series Connections	Max 4 batteries in series, up to 48V system class
Parallel Connections	Max 16 batteries in parallel
Maximum Parallel Energy	Up to 20.48kWh at 12V system class
Maximum Configuration	4S16P, using matched batteries and rated equipment
Charge Temperature Range	0 C to 55 C / 32 F to 131 F
Discharge Temperature Range	-20 C to 60 C / -4 F to 140 F
Recommended Storage Temperature	0 C to 35 C / 32 F to 95 F
Reconnect Temperature	50 C / 122 F
Dimensions	10.25 in L x 6.75 in W x 9.00 in H
Weight	21 lb / approx. 9.5 kg
Case Material	ABS and PC blend, UL94-V0 flame rating
Enclosure Protection	IP54
Terminal Type and Torque	M8 female | 8-12 Nm (71-106 in-lb)
Cycle Life	4,500+ cycles
Warranty	6-year manufacturer warranty

Recommended charging settings

Maximum Continuous Charge Current	100A

Bulk / Absorption Voltage	14.2V to 14.4V
Absorption End Condition	Stop when charge current <= C/20 or 15 minutes max
Float Voltage	Disabled preferred, or 13.3V to 13.6V
Re-Bulk Voltage	13.2V
Temperature Compensation	0mV/C / none
Equalization	Disabled
Battery Charge Temperature Range	0 C to 55 C / 32 F to 131 F
BMS High Voltage Cutoff	14.6V
SOC Recalibration Voltage	14.6V

BMS protection and compliance

BMS Protection	Overcharge, over-discharge, over-current, short-circuit, high temperature, and low temperature disconnects
Safety Features	20+ built-in safety features
Cell / Product Compliance	UL 1642 cells, UL 9540A cells, IEC 62619:2022, CE, RoHS
Shipping Classification	UN 38.3, Class 9

4. Safety Guidelines

Safe use depends on correct equipment, proper wiring, clean connections, compatible chargers, correct terminal torque, and operation within temperature and current limits.

Do not

- Do not mix this battery with lead-acid batteries in the same battery bank.
- Do not mix different battery models, capacities, ages, or chemistries in a series or parallel bank.
- Do not connect to a charger, alternator system, converter, inverter charger, solar controller, or DC-to-DC charger that cannot be configured for LiFePO4.
- Do not use lead-acid equalization, desulfation, or repair modes.
- Do not exceed 100A continuous charge current.
- Do not exceed 100A continuous discharge current.
- Do not exceed 300a @ 5 seconds.
- Do not charge the battery below 0 C / 32 F.
- Do not install without properly sized DC overcurrent protection.
- Do not submerge, pressure wash, or expose the battery to standing water.
- Do not continue use after a severe impact, fire event, water intrusion, or visible case damage.

Emergency conditions

If the battery smokes, becomes unusually hot, emits odor, leaks, swells, or behaves abnormally, stop use immediately. If safe, disconnect chargers and loads. Move people away from the battery and contact emergency services when fire, smoke, chemical exposure, or injury is possible. Follow the product SDS and emergency responder instructions.

WARNING: Do not use water directly on a damaged or burning lithium battery unless directed by emergency responders. Use an appropriate extinguisher and follow local emergency procedures.

5. Pre-Installation Checklist

Complete this checklist before connecting the battery. Most installation problems can be prevented before the first cable is attached.

Check	Item
[ ]	Battery case is undamaged and terminals are clean.
[ ]	Battery model, voltage, capacity, and application requirements have been confirmed.
[ ]	Battery tray or mounting location fits the 10.25 in L x 6.75 in W x 9.00 in H case with cable clearance.
[ ]	Charger, inverter charger, converter, solar controller, or DC-to-DC charger is configured for LiFePO4.
[ ]	All batteries in a bank are the same model, age, capacity, and state of charge.
[ ]	Main fuse or circuit breaker is selected for the wire, load, and system voltage.
[ ]	Cables and lugs are sized for current, length, voltage drop, and installation environment.

[ ]	Polarity has been verified before making final connections.
[ ]	Terminal hardware and torque wrench are available for 8-12 Nm tightening.
[ ]	External battery monitor or system monitor is configured if state-of-charge monitoring is required.

6. Installation Guide

Location

- Install in a clean, dry, accessible location protected from accidental impact.
- Allow airflow around the battery and connected equipment.
- Keep away from heat sources, sparks, open flames, fuel, and flammable materials.
- Avoid prolonged direct sunlight and locations that exceed the temperature limits.
- Do not install where standing water can collect around the battery case or terminals.

Mounting and orientation

Secure the battery so it cannot slide, tip, or impact nearby equipment during operation, vehicle motion, trailer motion, vessel motion, or transport. Use a tray, strap, bracket, or enclosure appropriate for the application and battery weight.

Install in an upright position unless Epoch product documentation for this exact model allows another orientation. Ensure the top terminals and wiring remain protected from accidental contact.

Environmental protection

The IP54 enclosure is dust-protected and splash-resistant for many everyday mobile, RV, marine house-power, and outdoor environments. It is not designed for submersion, pressure washing, bilge flooding, or continuous water exposure.

> **NOTICE:** Leave enough clearance above the terminals for cable bend radius, terminal boots, and inspection. Do not force cables to bend sharply at the terminal posts.

7. Electrical Connection Guide

Polarity

Connect positive (+) to positive and negative (-) to negative. Reverse polarity can damage the battery, charger, inverter, electronics, or connected loads.

DANGER: Before tightening the final connection, use a multimeter to confirm system polarity and voltage. Never rely only on cable color or assumptions.

Terminal connection procedure

1. Turn off chargers, inverters, loads, and DC disconnects before wiring.
2. Remove jewelry and use insulated tools.
3. Keep terminal caps or covers in place until each terminal is being wired.
4. Use clean, properly crimped lugs with flat contact surfaces.
5. Connect and tighten the positive terminal, then connect and tighten the negative terminal.
6. Tighten M8 terminal hardware to 8-12 Nm (71-106 in-lb). Do not over-tighten.
7. Install terminal boots or protective covers after final torque is confirmed.

Cable and protection requirements

Cable Size	Size conductors for maximum current, circuit length, voltage drop, ambient temperature, and applicable code requirements.
Main Protection	Install a fuse or DC-rated circuit breaker as close as practical to the battery positive terminal.
Voltage Rating	Protection devices and switches must be rated for the maximum system voltage, especially in series banks.
Wire Ampacity	The fuse or breaker must protect the smallest conductor in the circuit.
Lug Stack	Keep the terminal stack flat and secure. Use a busbar if multiple conductors must connect to one battery terminal.
Cable Routing	Route cables away from sharp edges, heat sources, moving parts, and wet areas.

Recommended disconnect sequence

To disconnect the battery from a system, turn off all chargers and loads, open the DC disconnect or breaker, remove the negative cable, then remove the positive cable. Cap or cover terminals immediately after disconnection.

8. Series and Parallel Battery Banks

The 12100-ECO supports up to 4 batteries in series and up to 16 batteries in parallel. Use only matched 12100-ECO batteries with similar age, condition, and state of charge.

Series connections

Series wiring increases voltage while amp-hour capacity remains the same. Use a charger and loads designed for the resulting system voltage.

Batteries in Series	System Class	Nominal Voltage	Capacity	Energy
1S	12V	12.8V	100Ah	1.28kWh
2S	24V	25.6V	100Ah	2.56kWh
3S	36V	38.4V	100Ah	3.84kWh
4S	48V	51.2V	100Ah	5.12kWh

WARNING: Series banks can exceed touch-safe voltages and require equipment rated for the complete pack voltage. Do not exceed 4 batteries in series.

Parallel connections

Parallel wiring increases amp-hour capacity and runtime while voltage remains the same. Use balanced wiring so each battery sees similar resistance during charging and discharging.

Batteries in Parallel	System Class	Nominal Voltage	Capacity	Energy
1P	12V	12.8V	100Ah	1.28kWh
2P	12V	12.8V	200Ah	2.56kWh
4P	12V	12.8V	400Ah	5.12kWh
8P	12V	12.8V	800Ah	10.24kWh
16P	12V	12.8V	1,600Ah	20.48kWh

Balanced wiring practices

- Charge each battery fully before connecting batteries into a bank.
- Use identical cable lengths and gauges for each battery in a parallel bank whenever practical.
- Connect loads and chargers through properly rated positive and negative busbars for larger banks.
- Fuse each battery or string when required by system design and applicable standards.
- Do not daisy-chain large banks when unequal cable resistance could cause uneven charging or discharging.

Maximum 4S16P configuration

A 4S16P bank uses matched batteries arranged into series strings and then parallel-connected for expanded voltage and capacity. Large series/parallel banks require equipment rated for the full system voltage and current, properly sized overcurrent protection, and balanced wiring.

9. Deep-Cycle Application Guide

RV, van, and camper systems

Use the 12100-ECO as a house-power battery for compatible 12V DC loads and power systems. Confirm that converters, inverter chargers, alternator charging equipment, and DC-to-DC chargers are programmed within the LiFePO4 charging settings in this manual.

Marine house-power systems

Use this battery for onboard electronics and accessory loads where the continuous and peak current demands are within specification. Protect the battery from bilge water, salt spray, unsecured tools, and direct terminal exposure.

Solar and off-grid systems

Program solar charge controllers for LiFePO4. Disable equalization and temperature compensation unless the charging equipment specifically requires a setting of 0mV/C. Confirm that open-circuit solar voltage and controller output are appropriate for the battery bank voltage.

Backup and standby systems

For standby use, test the system periodically under load and confirm that the charger maintains the battery within the recommended voltage range. Do not leave parasitic loads connected for long periods without a maintenance charge schedule.

Engine starting notice

> **NOTICE:** This model is not marketed as a cranking-rated battery. Use a cranking-rated battery for engine starting unless Epoch confirms compatibility for the specific engine and installation.

10. Charging Guide

Use lithium-compatible charging equipment programmed for LiFePO4 batteries. Compatible equipment may include an AC charger, converter, inverter charger, solar charge controller, or DC-to-DC charger.

Charging profile

Bulk / Absorption	14.2V to 14.4V
Maximum Charge Voltage	14.6V
Maximum Continuous Charge Current	100A
Absorption End	Stop when charge current <= C/20 or 15 minutes max
Float	Disabled preferred, or 13.3V to 13.6V
Re-Bulk	13.2V
Temperature Compensation	Disabled / 0mV/C
Equalization / Desulfation	Disabled
BMS High Voltage Cutoff	14.6V
SOC Recalibration	14.6V

First charge

Before first use, fully charge the battery with a compatible LiFePO4 charger. Confirm voltage, current, polarity, and temperature before leaving the system in service.

Cold-temperature charging

This battery has low-temperature charge protection but does not include internal heating. Do not attempt to charge below 0 C / 32 F. If the battery is below the charge temperature range, move it to a warmer location and allow it to stabilize before charging.

> **CAUTION:** Charging below the specified temperature range can damage lithium cells. Low-temperature charge protection is a safeguard, not a substitute for proper charging conditions.

Charging source checklist

Check	Item
[ ]	Charger is compatible with LiFePO4 batteries.
[ ]	Bulk/absorption voltage is set to 14.2V to 14.4V.
[ ]	Float is disabled or set to 13.3V to 13.6V.
[ ]	Equalization, desulfation, and repair modes are disabled.
[ ]	Charge current does not exceed 100A per battery.
[ ]	Battery temperature is within 0 C to 55 C / 32 F to 131 F.
[ ]	Solar, alternator, or converter output voltage cannot exceed the battery limits.

11. Battery Monitoring

Monitoring without Bluetooth

This Eco Series model does not include Bluetooth. Use a compatible external shunt-based battery monitor, system monitor, inverter charger display, solar charge controller display, or a reliable multimeter to monitor battery voltage, current, and state of charge.

Recommended monitoring practices

Voltage	Use a multimeter or system display to confirm resting voltage and charger output voltage.
Current	Use a shunt or system monitor to confirm charge and discharge current stays within limits.
State of Charge	A shunt-based monitor provides more useful SOC tracking than voltage alone on LiFePO4 batteries.
Temperature	Keep the battery within the listed charge, discharge, and storage temperature ranges.
Fault Response	If charging or discharging stops unexpectedly, check fuses, breakers, charger status, wiring, and temperature conditions.

NOTICE: Voltage alone is not a precise state-of-charge indicator for LiFePO4 batteries. Use a properly configured battery monitor when accurate SOC tracking is required.

12. Operation and Storage

Operating limits

Continuous Discharge Limit	100A
Maximum Discharge Current	200A
Peak Discharge Limit	300A @ 5 seconds
Continuous Charge Limit	100A
Operating Voltage Range	10.0V to 14.6V
Discharge Temperature Range	-20 C to 60 C / -4 F to 140 F
Charge Temperature Range	0 C to 55 C / 32 F to 131 F

Depth of discharge

LiFePO4 batteries can provide more usable energy than lead-acid batteries, but routine operation at moderate depth of discharge can improve long-term service life. Avoid leaving the battery fully depleted.

Storage

- Store in a clean, dry location within 0 C to 35 C / 32 F to 95 F whenever practical.
- For long-term storage, charge to approximately 50% state of charge or higher.
- Disconnect loads and chargers during storage unless the system is specifically designed for standby maintenance.
- Check voltage or monitor state of charge every 3 to 6 months and recharge if needed.

- Protect terminals from accidental short circuit while the battery is stored or transported.

> **CAUTION:** A battery stored at very low state of charge can enter low-voltage protection and may not be recoverable if left discharged for an extended period.

13. Maintenance

The 12100-ECO is maintenance-free compared with lead-acid batteries. It does not require watering or acid service. Routine inspections help maintain safe operation.

Maintenance schedule

Interval	Action
Before Each Trip or Use	Inspect case, terminals, cables, fuses, disconnects, and mounting hardware.
Monthly During Active Use	Check terminal tightness, cable condition, resting voltage, and system monitor readings.
Every 3 to 6 Months	Check state of charge during storage and recharge if needed.
Annually	Inspect torque, wiring layout, protection devices, battery tray, ventilation, and charger settings.
After Any Fault or Impact	Stop use, inspect for damage, record symptoms, and contact support as needed.

Terminal maintenance

- Turn off and disconnect chargers and loads before maintenance.
- Keep terminals clean and dry.
- Use a soft brush or dry cloth to remove dust and debris.
- Do not use solvents, abrasive cleaners, or pressure washing on the battery.
- Confirm M8 terminal hardware is tightened to 8-12 Nm (71-106 in-lb).
- Replace damaged lugs, cables, boots, or hardware before returning the battery to service.

Voltage checks

Use a reliable multimeter to check terminal voltage and charger output. Resting voltage changes slowly on LiFePO4 batteries, so use a shunt-based battery monitor and load testing when a more complete health check is needed.

14. Troubleshooting

Use the table below to identify common causes and corrective actions. Stop testing if there is smoke, heat, odor, swelling, liquid, arcing, or visible damage.

Symptom	Likely Causes	Corrective Actions
Battery will not charge	Charger off, reverse polarity, incompatible profile, BMS protection, low-temperature condition, blown fuse.	Confirm charger settings and polarity. Check fuses and disconnects. Warm the battery to within charge temperature range. Check charger status.
Battery voltage is low	Battery discharged, parasitic load, BMS low-voltage protection.	Disconnect loads. Charge with a compatible LiFePO4 charger. Check for parasitic draws before storage.

Low runtime	Higher load than expected, battery not fully charged, cold temperature, capacity imbalance in bank.	Fully charge. Measure load current. Check wiring balance. Test one battery at a time if in a bank.
Fuse or breaker trips	Short circuit, overload, inrush current, undersized protection, damaged cable.	Disconnect loads. Inspect wiring. Confirm load current and protection rating. Replace damaged parts.
Battery becomes hot	High ambient temperature, excessive current, poor ventilation, charger fault.	Reduce load or charge current. Improve ventilation. Confirm charger settings and stop use if abnormal.
Charging stops in cold weather	Battery temperature below charge limit; low-temperature charge protection active.	Move battery to a warmer location and allow it to stabilize before charging. Do not bypass protection.
Unexpected shutoff	BMS protection, low voltage, overcurrent, short circuit, or high/low temperature condition.	Remove load or charger. Check temperature, voltage, wiring, and protection devices before reconnecting.

WARNING: Do not repeatedly reset a fuse, breaker, charger, or BMS fault without identifying the cause. Repeated faults can indicate unsafe wiring or equipment mismatch.

15. Warranty and Support

Warranty coverage

The battery is accompanied by a 6-year manufacturer warranty. Warranty coverage applies to qualifying manufacturing defects under normal use and is subject to Epoch Batteries warranty terms and claim procedures.

Warranty exclusions

- Misuse, abuse, neglect, improper handling, or improper maintenance.
- Incorrect polarity, short circuit, overcurrent, or incompatible charging equipment.
- Use outside specified voltage, current, temperature, or environmental limits.
- Unauthorized modification, disassembly, repair, or tampering.
- Water intrusion, submersion, pressure washing, impact damage, fire, flood, or other external causes.
- Use with non-approved or incompatible accessories, chargers, or system components.
- Mixing with different battery models, capacities, ages, or chemistries in a battery bank.

Warranty claim procedure

1. Gather proof of purchase, model number, serial number, installation date, and a description of the issue.
2. Record photos of the installation, cables, fuses, charger settings, and any visible damage.
3. Record voltage, charger display information, monitor data, or other system observations if available.
4. Contact Epoch Batteries support for troubleshooting and claim instructions.
5. Do not ship or return a battery unless instructed by Epoch Batteries support.

Support contact

Phone	1-888-501-1846
Email	support@epochbatteries.com
Website	EpochBatteries.com

16. Commissioning and Maintenance Records

Use these records for installation, support, maintenance, and warranty documentation.

Commissioning record

Battery Model / SKU	
Serial Number	
Purchase Date	
Installation Date	
Installer / Owner	
Application	
System Voltage	
Number of Batteries	
Initial Resting Voltage	
Initial State of Charge	

Charger Model and Settings	
Main Fuse / Breaker Rating	
Cable Gauge and Length	
Terminal Torque Confirmed (8-12 Nm)	
External Battery Monitor Installed	
Low-Temperature Charge Protection Verified	

Maintenance log

Date	Voltage / SOC	Inspection Notes	Action Taken

End of manual.