

**MSA** **Four-Position  
Gang Charger for  
SAFEMTX™ Li-ION  
Battery Packs  
(P/N 10067285)**

## Instruction Manual

**⚠ WARNING**

THIS MANUAL MUST BE CAREFULLY READ BY ALL INDIVIDUALS WHO HAVE OR WILL HAVE THE RESPONSIBILITY FOR USING OR SERVICING THE PRODUCT. Like any piece of complex equipment, this instrument will perform as designed only if it is used and serviced in accordance with the manufacturer's instructions. OTHERWISE, IT COULD FAIL TO PERFORM AS DESIGNED AND PERSONS WHO RELY ON THIS PRODUCT FOR THEIR SAFETY COULD SUSTAIN SEVERE PERSONAL INJURY OR DEATH.

The warranties made by Mine Safety Appliances Company with respect to the product are voided if the product is not used and serviced in accordance with the instructions in this manual. Please protect yourself and others by following them. We encourage our customers to write or call regarding this equipment prior to use or for any additional information relative to use or repairs.

In North America, to contact your nearest stocking location, dial toll-free 1-800-MSA-INST  
To contact MSA International, dial 1-412-967-3354

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This manual is available on the internet at [www.msanet.com](http://www.msanet.com)

Manufactured by

**MSA INSTRUMENT DIVISION**

P.O. Box 427, Pittsburgh, Pennsylvania 15230

(L) Rev 0

10070503

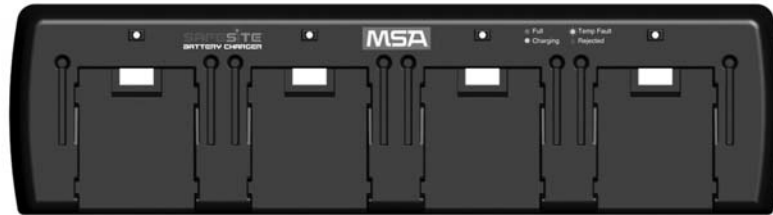
## MSA Permanent Instrument Warranty

- 1. Warranty-** Seller warrants that this product will be free from mechanical defect or faulty workmanship for a period of one (1) year, provided it is maintained and used in accordance with Seller's instructions and/ or recommendations. This warranty does not apply to expendable or consumable parts whose normal life expectancy is less than one (1) year such as, but not limited to, non-rechargeable batteries, sensor elements, filter, lamps, fuses etc. The Seller shall be released from all obligations under this warranty in the event repairs or modifications are made by persons other than its own or authorized service personnel or if the warranty claim results from physical abuse or misuse of the product. No agent, employee or representative of the Seller has any authority to bind the Seller to any affirmation, representation or warranty concerning the goods sold under this contract. Seller makes no warranty concerning components or accessories not manufactured by the Seller, but will pass onto the Purchaser all warranties of manufacturers of such components. **THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED, IMPLIED OR STATUTORY, AND IS STRICTLY LIMITED TO THE TERMS HEREOF. SELLER SPECIFICALLY DISCLAIMS ANY WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE.**
- 2. Exclusive Remedy-** It is expressly agreed that Purchaser's sole and exclusive remedy for breach of the above warranty, for any tortious conduct of Seller, or for any other cause of action, shall be the repair and/ or replacement at Seller's option, of any equipment or parts thereof, which after examination by Seller is proven to be defective. Replacement equipment and/ or parts will be provided at no cost to Purchaser, F.O.B. Seller's Plant. Failure of Seller to successfully repair any nonconforming product shall not cause the remedy established hereby to fail of its essential purpose.
- 3. Exclusion of Consequential Damage-** Purchaser specifically understands and agrees that under no circumstances will seller be liable to purchaser for economic, special, incidental or consequential damages or losses of any kind whatsoever, including but not limited to, loss of anticipated profits and any other loss caused by reason of non-operation of the goods. This exclusion is applicable to claims for breach of warranty, tortious conduct or any other cause of action against seller.

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## Chapter 1, Overview



*Figure 1-1. Four-position Gang Charger*

The SAFESITE external charger:

- is a multi-station unit containing four smart chargers for use with SAFEMTX Li-Ion battery packs (P/N 10060720)
- is designed to be used on a desk, wall mounted, or with the SAFEPAC™ Perimeter Area Command Kit
- contains independent charger circuits housed in a single package and designed to accommodate up to four Li-Ion battery packs
- is designed to:
  - recognize only Li-Ion packs
  - prevent any charge output from being applied to Alkaline battery packs.

Each charger:

- is SMBus V1.1 compliant
- accepts charging voltage and current commands from the battery pack.
  - If a battery's voltage is so low that SMBus communications cannot be established, the charger supplies a wake up charge current of 80 mA until the pack voltage rises sufficiently to begin communications.

## Chapter 2, Application

Each of the four positions on the charger contain an LED to indicate the charge status at that station.

**⚠ WARNING**

**Use only to charge the MSA Li-Ion SAFEMTX battery pack (P/N 10060720).**

## Chapter 3, Specifications

**Table 3-1. Performance Specifications**

<b>OPERATING TEMPERATURE RANGE</b>		0°C to +50°C. Charging is inhibited above 50°C and charge rate is reduced below 10°C
<b>STORAGE TEMPERATURE RANGE</b>		-30°C to +70°C
<b>HUMIDITY RANGE</b>		5 to 95% RH non-condensing
<b>ELECTRICAL CHARACTERISTICS</b>		Each charging station is optimized for charging the SAFEMTX Li-Ion battery pack (P/N 10060720) with the pre-programmed parameters upon request from the battery
<b>POWER INPUT</b>	<b>INPUT VOLTAGE</b>	24 VDC nominal, full range is 20 to 30 VDC.
	<b>INPUT CURRENT</b>	3.2 A nominal for fast charge on all four stations; actual depends on charge current requested by battery
<b>POWER SUPPLY</b>		External desktop switching supply, 24 VDC output, 80 W maximum; Accepts input of 100 to 240 VAC, 50/60 Hz. To have North American and international agency approvals
<b>BATTERY TYPE</b>		SAFEMTX Li-Ion packs (P/N 10060720); Alkaline packs not recognized or cause Fault indicator LED to light
<b>BATTERY CAPACITY RANGE</b>		8800 mAh (SAFEMTX Li-Ion pack)

**Table 3-2. Charge Time Vs. Pack Capacity**

<b>PACK CAPACITY (MAH)</b>	<b>PACK CONFIGURATION</b>	<b>FULL CHARGE TARGET</b>	<b>FULL CHARGE LIMIT</b>
8800	2S4P	6 hours	8 hours

NOTE: Charge termination and charging parameters are controlled by the battery pack via SMBus communications.

## **Chapter 4, Operation**

### **Battery Detection**

Battery presence is detected via battery:

- voltage
- safety signal (thermistor)
- SMBus communications, according to battery chemistry.

### **Lithium Ion Battery Pack**

- Li-Ion batteries are recognized and validated via SMBus communications
- Pack temperature is verified by measuring voltage on the safety circuit (Thermistor) line
- Status LED is turned ON by the CPU on the basis of battery voltage detection and/or SMBus messages.

### **Alkaline Battery Pack**

- Alkaline battery packs:
  - do not communicate with the charger via the SMBus
  - contain a resistor in place of the Thermistor to indicate a non-rechargeable battery.
- As an additional safety measure, an Alkaline pack:
  - cannot receive a charging current
  - positive terminal is on a separate pin from that of the Li-Ion pack positive terminal.
- The charger may include a Fault LED to indicate it will not accept a detected Alkaline pack.

## Charge Voltage Range

- Normal charge voltage range is from 5.0 to 8.4 VDC.
- The charger can charge packs with lower voltages:
  - after detecting the Thermistor connection
  - with only a reduced soft-start charging current.

## Charge Rate

The Charger charge rate is:

- determined by the battery pack
- optimized for fast charging Li-Ion packs at 1.8 A.

The conditioning charge for low voltage packs is 80 mA.

## Battery Drain – Charger OFF

If a battery pack is plugged into the charger, but no external DC power is applied, the charger will draw no more than 1 mA from the battery.

## Idle Power Consumption

If DC power is applied to the charger with no battery connected, the maximum input current will be less than 50 mA.

## Charger Modes

The external charger supports two charging modes and an idle mode.

### Wake-up Charging Mode

The charger enters the Wake-up charging mode

- when a connected battery does *not* send Charging Current and Charging Voltage command messages
- usually due to a pack voltage too low to establish SMBus communications
- when pack temperature is less than 50°C and greater than 0°C.

The charger exits this mode if the:

- pack sends Charging Current and Charging Voltage commands over the SMBus
- Thermistor indicates that the pack is over 50°C or less than 0°C .

### **Controlled Charging Mode**

The Controlled Charging Mode:

- is the normal charger mode
- occurs when the battery sends Charging Current and Charging Voltage command messages over the SMBus, including when a battery pack requests a 0 mA charging current.
  - If a timeout period of  $175 \pm 35$  seconds passes when no subsequent messages are received, the charger reverts back to the Wake-up charge mode.

### **Idle Mode**

In this mode, the charger:

- applies no charge output
- enters this mode when:
  - external power is connected and no battery is connected to the charger or
  - battery is connected, but the temperature is above 50°C or below 0°C.

## Chapter 5, LED Indicators and External Power Jack

### LED Indicators

- There are four bicolor LED indicators in the unit, one for each charging station.
- The charging station LEDs:
  - are controlled by a small Micro-Controller Unit
  - indicate station status as shown in TABLE 5-1.

**Table 5-1. LED indicators**

<b>COLOR</b>	<b>STATUS CONDITION</b>
OFF	No battery installed
Amber	Charging
Green	Battery fully charged
Red	Battery not accepted
Flashing Amber	Battery temperature out of range

### External Power Jack

- Coaxial DC jack, 2.5 x 5.5 mm, rated at 5 A.