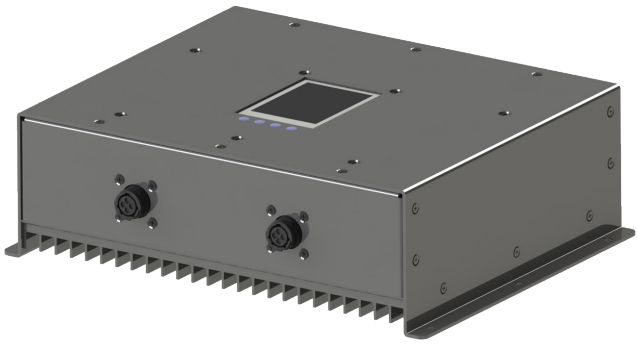
CHARGETEK

2-Bank Charger

Versatile and Programmable 2-bank Lead-Based Charging System



- *California Energy Requirement compliant*
- *Fully isolated and programmable banks*
- *Sealed Unit with optional fan cooling*
- *Customized charge algorithms*
- *Optional Temperature compensation*
- *Transient protected input/output*
- *Over temp protection with auto reset*
- *Overcurrent / overvoltage protected*
- *Digital and Ethernet Communications*
- *Reverse polarity protected*
- *AC and DC input options*
- *Remote GUI monitoring*
- *Diagnostic Routine*
- *Four Year Warranty*

Description

The CTMB2 is a 2 bank versatile and sophisticated charging system for lead based batteries. With a wide operating temperature range (-20C to 50C) and environmentally rugged design, it is especially suited for high end industrial applications. The CTMB2 precisely controls the charging algorithm to insure a complete recharge every time.

Each bank is independently programmable, electrically isolated with no common negative or positive, and operation is completely automatic.

The CTMB2 series is intended for use with several types of lead based battery chemistries such as SLA, AGM, and maintenance free. This multibank charging system has 6 factory standard battery algorithms that can be customized upon request. A programmable equalization routine provides for desulfation to extend battery life. A user friendly and very informative LCD display is also the programming interface. The display also has a digital volt meter, amp meter, charging status and timing indicators.

The enclosure is completely sealed from dust, other environmental contaminants and is splash proof. The CTMB2 can be connected indefinitely making it ideal for remote and standby applications.

An optional fan can be added for operation in extremely high ambient temperatures,This multibank product can be ordered with input and output power connectors per customer specification.

AC input model specifications

PARAMETER	DESCRIPTION / CONDITIONS
AC input voltage range	3 input ranges covering 85 VAC - 240 VAC
Input AC amps (max)	Model Dependant
AC input configuration	AC input: line, neutral , chassis ground
Connector	IEC 320

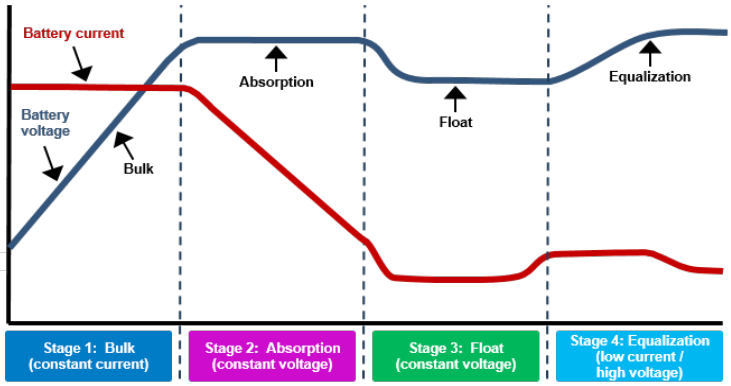
DC input model specifications

PARAMETER	DESCRIPTION / CONDITIONS
DC input voltage range	4 input ranges covering 18 VDC to 140 VDC
Input DC amps (max)	Model Dependant
DC input configuration	DC input: DC Power, DC Return, Chassis ground
Connector	PP-75 Anderson

1860 Eastman Unit 109, Ventura, CA 93003 Phone: (866) 482-7930 Fax: (805) 650-7936 www.chargetek.com

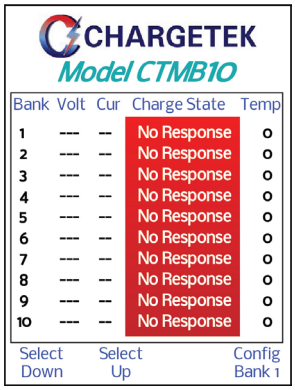
Charging specifications

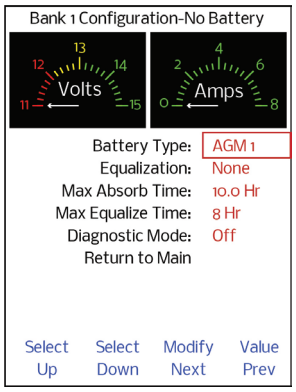
Four Stage Lead-based battery charging curve

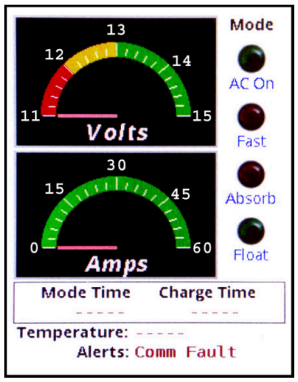


Charging algorithm: Supplies constant current $I_{mx.}$ to battery until absorption voltage is reached (V_{FSTERM}). Transition to absorption mode follows and regulates battery voltage at V_{FSTERM} until current decreases to $I_{ABTERM.}$ Float mode follows and regulates battery voltage at $V_{FLOAT.}$. At the user's discretion, an equalization mode can be initiated. The equalization voltage V_{EQ} is approximately 2.5V/cell and battery current is limited. For more information, please refer to www.chargetek.com/images/pdfs/equal.pdf

Standard LCD DIsplays







2 Bank Lead-Based Common Specifications

CHARGING PARAMETERS	DESCRIPTION
Absorption transition timeout	10 hours following 85% of V_{FSTERM} (*factory settable upon request*)
Max charging time	Terminate if $> I_{max}/3$ > 15 hours (*factory settable upon request*)
Overvoltage protection	Maximum Charging Voltage + 1.0V
Output noise and ripple (PARD)	<150mV, 100MHz BW
Regulation	± 0.5%
Efficiency	Measured at max power, varies from 83% to 92% depending on model

2 Bank Lead-Based Charging Specifications

12V Battery Bank

PARAMETER	DESCRIPTION / CONDITIONS	VALUE	UNITS
V_{FSTERM}	Fast charge transition voltage	14.6 ±0.1	VDC
V_{FLOAT}	Float voltage, $I_{OUT} < I_{FS}$, 25°C	13.6 ±0.1	VDC
I_{max}	Maximum charging current	xx.x ±0.1 (40 Amp model) xx.x ±0.1 (20 Amp model) xx.x ±0.1 (10 Amp model)	Amps
I_{ABTERM}	Absorption transition current	2.5 ±0.1	Amps
V_{EQ}	Equalization voltage @ < 1A	15.5±0.1	volts
I_{SBY}	Max standby current, AC off	1.0	ma

24V Battery Bank

PARAMETER	DESCRIPTION / CONDITIONS	VALUE	UNITS
V_{FSTERM}	Fast charge transition voltage	29.2 ±0.1	VDC
V_{FLOAT}	Float voltage, $I_{OUT} < I_{FS}$, 25°C	27.2 ±0.1	VDC
I_{max}	Maximum charging current	xx.x ±0.1 (20 Amp model) xx.x ±0.1 (10 Amp model) xx.x ±0.1 (5 Amp model)	Amps
I_{ABTERM}	Absorption transition current	2.0 ±0.1	Amps
V_{EQ}	Equalization voltage, <1A	31.0±0.1	Volts
I_{SBY}	Max standby current, AC off	1.5	ma

36V Battery Bank

PARAMETER	DESCRIPTION / CONDITIONS	VALUE	UNITS
V_{FSTERM}	Fast charge transition voltage	43.8 ±0.2	VDC
V_{FLOAT}	Float voltage, $I_{OUT} < I_{FS}$, 25°C	13.5 ±0.2	VDC
I_{max}	Maximum charging current	xx.x ±0.1 (12 Amp model) xx.x ±0.1 (7 Amp model) xx.x ±0.1 (3 Amp model)	Amps
I_{ABTERM}	Absorption transition current	2.0 ±0.1	Amps
V_{EQ}	Equalization voltage @ < 1A	46.5 ±0.2	Volts
I_{SBY}	Max standby current, AC off	1.8	ma

48V Battery Bank

PARAMETER	DESCRIPTION / CONDITIONS	VALUE	UNITS
V_{FSTERM}	Fast charge transition voltage	58.4 ±0.2	VDC
V_{FLOAT}	Float voltage, $I_{OUT} < I_{FS}$, 25°C	54.4 ±0.2	VDC
I_{max}	Maximum charging current	xx.x ±0.1 (10 Amp model) xx.x ±0.1 (5 Amp model) xx.x ±0.1 (3 Amp model)	Amps
I_{ABTERM}	Absorption transition current	1.5 ±0.1	Amps
V_{EQ}	Equalization voltage @ < 1A	62.0 ±0.2	Volts
I_{SBY}	Max standby current, AC off	1	ma

2-bank Charger Ordering Guide,p/n Mx2G*bcd-r*

<table>
<tr><th>P/N Field</th><th>Definition</th><th>Options</th><th>Description</th></tr>
<tr><td>x</td><td>Enclosure Options</td><td>A - High Power Enclosure
B - Med Power Enclosure</td><td>Describes the enclosure type, see Output and Mounting section for descriptions.

The enclosure is a factor of voltage and current options, see the description of options c, d below.</td></tr>
<tr><td>b</td><td>Input Power Type and Ranges</td><td>For AC input chargers, three options; A, B and V are available

For DC input chargers, 4 options; 08, 09, 10 and 11 are available</td><td>AC Input Voltage Range Options:
<table>
<tr><th>Option</th><th>AC Input Voltage Range</th></tr>
<tr><td>A</td><td>85 - 140 VAC</td></tr>
<tr><td>B</td><td>180 - 300 VAC</td></tr>
<tr><td>C</td><td>85 - 300 VAC</td></tr>
</table>
DC Input Voltage Range Options:
<table>
<tr><th>Option</th><th>DC Input Voltage Range</th></tr>
<tr><td>08</td><td>18 - 36 VDC</td></tr>
<tr><td>09</td><td>30 - 50 VDC</td></tr>
<tr><td>10</td><td>38 - 75 VDC</td></tr>
<tr><td>11</td><td>72 - 140 VDC</td></tr>
</table></td></tr>
<tr><td>c, d</td><td>Output Voltage and current options</td><td>For each output voltage several output current models are available for each enclosure type, choose voltage (c) and current options (d) for the table the right</td><td>Charging Current vs Output Voltage and Enclosure Type
<table>
<tr><th colspan="5">Lead Based Chargers</th></tr>
<tr><th>Output Voltage</th><th>Voltage Option(c)</th><th>Output Current</th><th>Current Option(d)</th><th>Enclosure</th></tr>
<tr><td>12V</td><td>12</td><td>40 Amps</td><td>40</td><td>MA</td></tr>
<tr><td>12V</td><td>12</td><td>20 Amps</td><td>20</td><td>MB</td></tr>
<tr><td>12V</td><td>12</td><td>10 Amps</td><td>10</td><td>MB</td></tr>
<tr><td>24V</td><td>24</td><td>20 Amps</td><td>20</td><td>MA</td></tr>
<tr><td>24V</td><td>24</td><td>10 Amps</td><td>10</td><td>MB</td></tr>
<tr><td>24V</td><td>24</td><td>5 Amps</td><td>5</td><td>MB</td></tr>
<tr><td>36V</td><td>36</td><td>12 Amps</td><td>12</td><td>MA</td></tr>
<tr><td>36V</td><td>36</td><td>7 Amps</td><td>7</td><td>MB</td></tr>
<tr><td>36V</td><td>36</td><td>3 Amps</td><td>3</td><td>MB</td></tr>
<tr><td>48V</td><td>48</td><td>10 Amps</td><td>10</td><td>MA</td></tr>
<tr><td>48V</td><td>48</td><td>5 Amps</td><td>5</td><td>MB</td></tr>
<tr><td>48V</td><td>48</td><td>3 Amps</td><td>3</td><td>MB</td></tr>
</table></td></tr>
<tr><td>r</td><td>Options</td><td>List of Available Options, listed separated by ‘-’ characters, some options are mutually exclusive.</td><td>An: External Interface, choose n as follows:
0 - RS-232, 1 - RS-485, 2 - Wired Ethernet, 3 - CAN,
5 - Wireless Ethernet, 99 - Special
Consult factory for others</td></tr>
<tr><td colspan="4">Example: P/N MB2GC2410-R1 specifies a 2-bank Lead-based charger with an AC input voltage range of 85 - 280 VAC using enclosure B, and has 24V outputs rated at 10 amps each. An optional RS-485 interface is included.</td></tr>
</table>

Certifications and Compliance (model dependant - consult factory)

a	UL CSA
b	CE mark
c	California Energy Compliant
d	RF emissions: US FCC Part 15 Class A, CISPR 22:2009
e	IEC 555, power factor
f	IEC 61000-4-5; Class 4 Severity Level, Surge
g	IEEE C2-2012 National Electrical Safety Code
h	NFPA 70-2014 National Electric Code
i	IEC 60950 Safety of IT Equipment; Pollution Degree 2
j	WEEE and Restriction of Hazardous Substances (ROHS) Directives 2002/95/EC
k	T-Mark

Workmanship specifications

IPC-610	Acceptability of electronic assemblies IPC J-STD-006 Requirements for electronic grade solder alloys and fluxed and non-fluxed solid solders for electronic soldering applications
IPC-2221	FR4, 130C 94V-0
IPC/WHMA-A-620	Requirements and acceptance of wiring and cabling

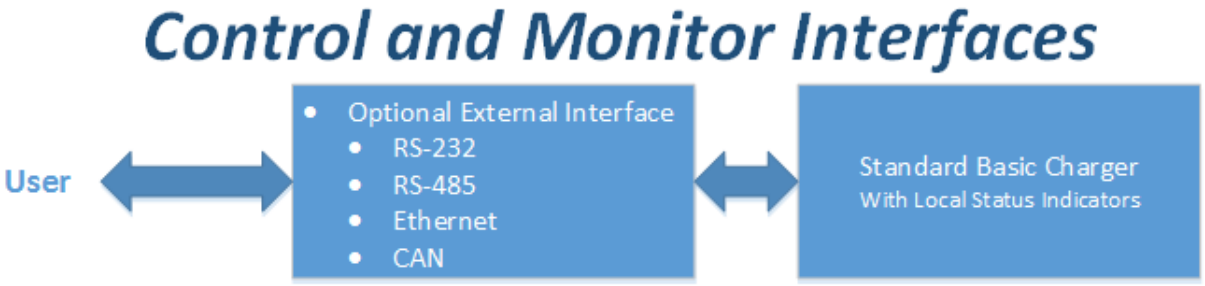
Mechanical specifications

PARAMETER	(units are in inches and pounds)
Dimensions	Enclosure A/B: 11.0 (L) x 8.5 (W) x 3.34 (H)
Chassis material	Aluminum
Chassis finish	Black anodized
Clearance	15 inches all sides
Mounting	#6 screws at six locations
Battery connection	4 foot cables with ring terminals
Fan connector	Molex P/N 53048-0310
Weight	Twelve pounds
Fan noise at full speed	< 45dBA at 10 feet

Environmental specifications

PARAMETER	DESCRIPTION / CONDITIONS
Operating environment	Indoor/outdoor - IP67 -not submersible
Storage temp.	-40°C to +80°C
Operating temp.	-20°C to +50°C at maximum output over entire DC voltage range
Humidity	0°C to +95°C relative humidity (non-condensing)
Operational altitude	10,000 feet
Vibration	MIL-STD-810 or IEC60068-2-6 and -2-64 as applicable
Shock	MIL-STD-810 or IEC60068-2-27 as applicable
Isolation	Input - chassis: 2KVDC Input - output: 2KVDC Output - chassis: 500VDC
DC leakage current	Input - chassis: < 200uA at 2KVDC Input - output: < 100uA at 2KVDC
AC leakage current	< 3.5mA at 264VAC, 60Hz

Control and monitoring



Standard Control Functions:

- On/Off
- Terminating Voltage
- Current Limiting
- Termination Current
- Pre-charge Current

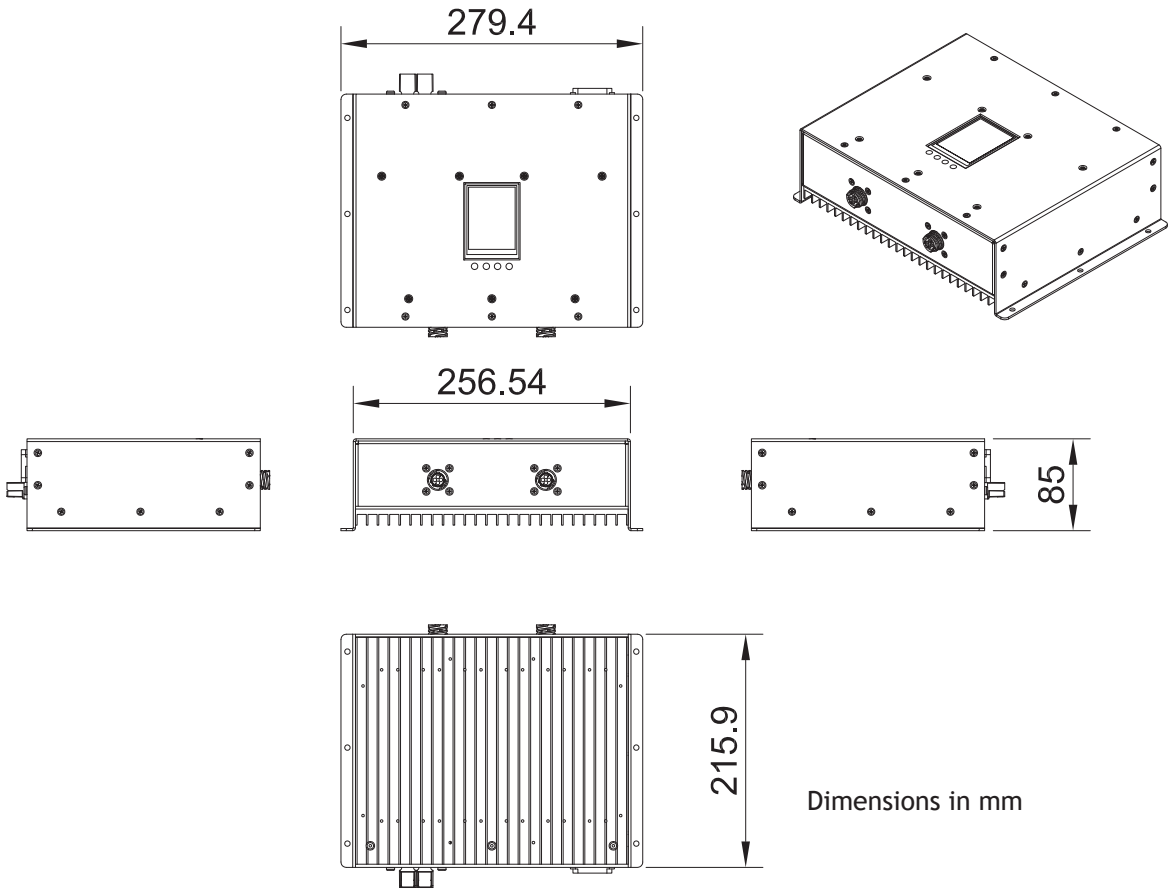
Standard Monitoring Functions:

- Charger State
- Voltage
- Current
- Control Settings
- Temperature
- Status, Warnings, Errors

Standard Monitoring Functions:

- Charger State
- Errors

Outline and mounting



Dimensions in mm