



***La MARCHÉ***®

**BI SERIES**

***BATTERY INFORMER***

**INSTRUCTION MANUAL**

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**IMPORTANT SAFETY INSTRUCTIONS**  
FOR THE  
LA MARCHE POWER CONVERSION EQUIPMENT  
**SAVE THESE INSTRUCTIONS**

This manual contains important safety and operating instructions for the La Marche Power Conversion Equipment.

Before using this equipment, read all instructions and cautionary markings on (1) unit, (2) battery, and (3) product using the battery.

**CAUTION: To reduce risk of injury and/or damage to the batteries, use only the type of batteries specified on the charger.**

**Do not** expose equipment to rain or snow.

**Do not** operate equipment if it has received a sharp blow, been dropped, or otherwise damaged in any way; take it to a qualified serviceman.

**Do not** disassemble this unit; take it to a qualified serviceman when service or repair is required. Incorrect re-assembly may result in a risk of electric shock or fire.

To reduce risk of electric shock, disconnect this unit from the AC supply, or batteries and loads before attempting any maintenance or cleaning. Turning off controls will not reduce this risk.

**WARNING – THERE IS A RISK OF EXPLOSIVE GASSES AND WORKING IN THE VICINITY OF A BATTERY IS DANGEROUS. SOME BATTERIES GENERATE EXPLOSIVE GASES DURING NORMAL BATTERY OPERATION. FOR THIS REASON, IT IS OF UTMOST IMPORTANCE THAT EACH TIME BEFORE USING THIS UNIT, YOU READ THIS MANUAL AND FOLLOW THE INSTRUCTIONS EXACTLY.**

To reduce risk of battery explosion, follow these instructions and those published by the battery manufacturer and manufacturer of any equipment you intend to use in the vicinity of the battery.

Review cautionary marking on all products.

**PERSONAL PRECAUTIONS:**

1. Someone should be within range of your voice or close enough to come to your aid when you work near a battery.
2. Have plenty of fresh water and soap nearby in case the battery electrolyte contacts skin, clothing, or eyes.
3. Wear complete eye protection and clothing protection. Avoid touching eyes while working near a battery.
4. If the battery electrolyte contacts skin or clothing, wash immediately with soap and water. If the electrolyte enters the eye, immediately flood the eye with running cold water for at least ten (10) minutes and get medical attention immediately.
5. Never smoke or allow a spark or flame in vicinity of a battery.
6. Be extra cautious, DO NOT drop metal onto a battery. It might spark or short-circuit the battery or cause an explosion.
7. Remove personal metal items such as rings, bracelets, necklaces, and watches when working with a battery. A battery can produce a short-circuit current high enough to weld these items causing severe burns.
8. NEVER charge a frozen battery.

**INSTRUCTIONS FOR BATTERY INFORMER SERIES**

**PREPARING TO CHARGE**

1. If it is necessary to remove the battery connections, always remove grounded terminal from the battery first. Make sure all loads are disconnected and unit is off, so as not to cause an arc.
2. Be sure the area around the battery is well ventilated while the battery is being charged.
3. When cleaning battery terminals, be careful to keep corrosion from coming in contact with eyes.
4. Study all the battery manufacturer's specific precautions such as removing or not removing cell caps while charging, recommended rates of charge, and maintenance procedures.

**UNIT LOCATION**

- Never place this unit directly above the standard flooded battery. Gases from the battery will corrode and damage equipment. A sealed maintenance free or valve regulated lead acid (VRLA) may be placed below this equipment.
- Never allow the battery electrolyte to drip on this unit when reading the specific gravity or filling the battery.
- Do not operate this unit in a closed-in area or restrict ventilation in any way.
- Do not set any battery on top of this unit.

**DC CONNECTION PRECAUTIONS**

Connect and disconnect DC output cables only after setting all of this unit's switches to off position and removing AC input supply.

**GROUNDING INSTRUCTIONS**

This battery charger should be connected to a grounded, metal, permanent wiring system; or an equipment grounding conductor should be run with circuit conductors and connected to equipment-grounding terminal or lead on battery charger. Connections to battery should comply with all local codes and ordinances.

**CAUTION: DO NOT PULL ON OUTPUT CABLES WHEN DISCONNECTING CHARGER FROM BATTERY.**

## RECEIVING INSTRUCTIONS AND GENERAL EQUIPMENT INFORMATION

**CAUTION: To ensure safe installation and operation, the information given in the instruction manual should be read and understood before installing or using the equipment.**

### **RECEIVING INSTRUCTIONS**

Unpacking and Inspection: Examine the shipping crate upon arrival. If there is obvious damage, describe on the receiving documents. Within a few days after delivery, the equipment should be uncrated and carefully inspected for hidden damages. When removing packaging material, be careful not to discard any equipment, parts, or manuals. If any damage is detected you should:

1. File a claim with the carrier within five (5) days.
2. Send a copy of the claim to La Marche Mfg. Co.
3. Call La Marche Mfg. For a RETURN MATERIAL AUTHORIZATION NUMBER.

Failure to properly file a claim for shipping damages, or provide a copy of the claim to La Marche Mfg., may void warranty service for any physical damages reported for repair.

### **HANDLING**

**WARNING: Equipment can be very heavy, and top-heavy. Use adequate manpower or equipment for handling. Until the equipment is securely mounted, care must be used to prevent the equipment from being accidentally tipped over.**

### **NOMENCLATURE PLATES**

Each piece of La Marche Mfg. Equipment shipped is identified by part number on the nomenclature plate.

### **ADJUSTMENTS**

All equipment is shipped from the factory fully checked and adjusted. Do not make any adjustments unless the equipment has been powered-up and the settings have been determined to be incorrect.

### **SPARE PARTS**

To minimize downtime during installation or normal service, it is advisable to purchase spare fuses, circuit boards and other recommended components. Please refer to the list of recommended spare parts and their La Marche Mfg. Part numbers included with the instruction manual. It is recommended that spare fuses be ordered for all systems.

To order spare parts, please contact La Marche Mfg. (847)-299-1188 during business hours and ask for the Parts Department.

## GENERAL INFORMATION

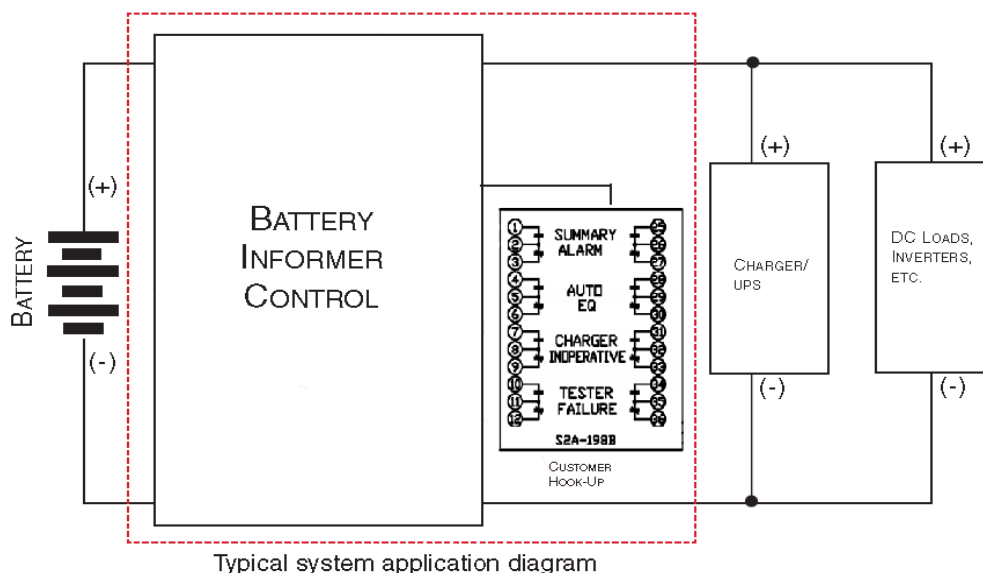
The stationary Battery Informer can be installed in any battery system. It can determine the condition of your battery under load, without disruption to the system operation. A nameplate inside the unit indicates the DC voltage and the Battery Informer amp hour rating. (See Data Sheet for more information)

The Battery Informer performs a test on the battery either manually or automatically every 14 days (the Auto test cycle is adjustable between 1 and 120 days). During the test, both the battery and the charger remain connected to the load. The Battery Informer is designed so that the battery will experience a very minor discharge during the test which does not affect the life of the battery. Testing the battery involves drawing a small amount of current from the battery (approximately 0.08% of the rated Amp-Hour capacity of the battery per minute) for only 1, 2 or 3 minutes based on the set test length.

In the rare case of any failures in the Battery Informer, the overall system is not affected. The load remains powered by the battery and/or the charger under the system's normal operation.

## ELECTRICAL CONNECTIONS

To operate the Battery Informer, connect the battery, battery charger/rectifier and load to the proper terminals within the unit.



\*\*\*\*\*OBSERVE PROPER POLARITY\*\*\*\*\*

(See schematic for more information)

## FRONT PANEL LCD DISPLAY AND LED INDICATORS

The front panel has an LCD Display and six (6) LED indicators.

<b>GREEN</b> LED	Test Pass – System Passed Test
<b>RED</b> LED's	Manual Test – Manually started test in process Test in process Check Battery System – problem in battery Open Cell Detected – in system battery Tester Failure – problem in Battery Informer
LCD Display	Displays Current Status of the System
<b>RESET</b> Button (La Marche Logo)	Resets the Battery Informer
Mode Button	Starts a Manual Test on the Battery Switches to next parameter (in Calibration Mode) on the display
<b>UP/DOWN</b> Buttons	Selects what display shows – Battery voltage, EQ cycle time, Amp-hour capacity, Next auto test, Total tests, Total passed tests and LED test Changes parameter value (in Calibration Mode)

**TABLE 1**

## OPERATION AUTOMATIC / MANUAL

After all connections are made, the LCD display on the Battery Informer (BI) will read system's DC voltage and current. Make sure to maintain the correct polarity. All positive wires are connected to one side of the BI and all negative wires are connected to the other side (per unit's terminal markings). Apply AC power to the battery charger.

Preset from the factory the BI will not have a reference discharge curve saved. For the very first test performed on the battery, the BI will use preset threshold values in the software to determine the status of the battery.

## **INSTRUCTIONS FOR BATTERY INFORMER SERIES**

After performing the first test on the battery in the system, the user should set the test results as a reference curve (which is done through the customer calibration mode as described later in this manual). If this new reference curve is activated (through the customer calibration mode), the BI will compare every test performed on the battery to this new reference curve. This will provide the user with information about the trend of change in battery's performance.

In order to start a test, the battery's voltage must be above 2.075 Volts/Cell (V/C) for Lead-Acid (LA) batteries (1.3 V/C for Ni-Cad (NC) batteries). If the battery voltage is too low, the BI will display an error message stating that the battery's voltage is below the pretest voltage threshold value.

*NOTE: The length of the test period is adjustable to 1, 2 or 3 minutes (through the customer calibration mode). Factory default setting is 1 minute. Discharge curves of the same test period length can be compared with each other; if the test period length was changed, the saved reference curve will be lost and the customer will have to save a new reference curve for the new test period length.*

### ***AUTOMATIC TEST:***

The Battery Informer is factory set to automatically check the system every fourteen (14) days.

To re-set the test interval, enter the Customer Calibration Mode by pressing both Up and Mode buttons (press the Up button first - the LCD display should change, hold it down and then press the Mode button) for about 5 seconds, after "Customer Calibration Mode" appears on the LCD display release both buttons. The remote equalize hours or test interval days can be raised or lowered with the Up ( ↑ ) and Down ( ↓ ) buttons. The Mode button proceeds to the next parameter until "Saving Settings Please Wait..." is displayed – this saves all the changes and ends the Customer Calibration Mode.

### ***MANUAL TEST:***

To manually activate a test on the battery, push the mode button, both red "Test In Process" and "Manual Test" LEDs will illuminate indicating the battery test is in operation. The timer on the LCD display will begin counting down starting at 60 seconds (if test is set to 1 minute).

### **THE FOLLOWING CONDITIONS MUST BE MET TO RUN THE BATTERY TEST**

- ✓ The battery voltage must be at least 2.075 V/C (1.3 V/C NC) (charger is operating) for the battery load test to begin.
- ✓ The Battery Informer has forced cool-time override. This feature will not let you perform a test within a half (1/2) hour of the last test. This gives the load resistors time to cool between tests.

**INSTRUCTIONS FOR *BATTERY INFORMER* SERIES**

***TEST PRESET THRESHOLD VALUES:***

The Battery Informer uses the following threshold values when testing the battery:  
(values are presented in Volts/Cell for both Lead-Acid and Ni-Cad batteries)

**Pretest Voltage**                      LA 2.075 V/C                      NC 1.300 V/C

Battery must be above this threshold in order to start the test

**Test Pass Voltage**                      LA 1.90 V/C                      NC 1.15 V/C

Battery must remain above this threshold for the duration of the test.

**Test Fail Voltage**                      LA 1.85 V/C                      NC 1.13 V/C

When the voltage dips to this threshold value or below it signifies a sulfated battery or possible loose connection.

**Open Cell Test Voltage**                      LA 1.00 V/C                      NC 0.5 V/C

When the voltage dips to this or below it signifies a possible open cell has been detected.

**Delay Test Voltage**                      LA 2.05 V/C                      NC 1.28 V/C

When the voltage dips to this or below the test will not be performed for 12 hours.

***Battery Informer LED Indicators:***

**Test Pass LED**

LED is turned on at the end of the test if the battery voltage is above the Test Pass Voltage.

**Test In Process LED**

LED is turned on when the test load is engaged and is turned off when the test is either completed or terminated by either the user or a failure condition.

**Manual Test LED**

LED is turned on when the test is started manually.

**Check Battery System LED**

LED is turned on when the voltage drops below the reference curve voltage.

LED is turned on when the voltage drops to or below the Delay Test Voltage.

LED is turned on at the end of the test if the voltage drops to or below the Test Pass Voltage.

LED is turned on if the voltage drops to or below the Test Fail Voltage during the test.

**Open Cell Detected LED**

LED is turned on if the voltage drops to or below the Open Cell Test Voltage during the test.

## INSTRUCTIONS FOR ***BATTERY INFORMER*** SERIES

### **Tester Failure LED**

The voltage across the contacts is monitored and converted into a logic level. An incorrect state can be detected indicative of open or welded contacts rendering the BI inoperative. LED is turned on should a Tester Failure condition be detected.

### **Charger Inoperative LED**

LED is turned on when the voltage drops to or below the Delay Test Voltage.

### **Float LED**

Flashes only during lamp test.

### **Equalize LED**

LED is turned on when the voltage drops to or below the Delay Test Voltage (when the "Remote Auto-Equalize" contacts are triggered).

LED is turned on if the voltage drops to or below the Test Fail Voltage during the test.

### **Alarm LED**

LED is turned on when the voltage drops below the reference curve voltage.

LED is turned on at the end of the test if the voltage drops to or below the Test Pass Voltage.

LED is turned on if the voltage drops to or below the Open Cell Test Voltage during the test.

LED is turned on if the voltage drops to or below the Test Fail Voltage during the test.

LED is turned on when the voltage drops to or below the Pretest Voltage.

LED is turned on should a Tester Failure condition be detected.

## ***TEST RESULTS:***

When the test is complete, the battery's discharge curve can be displayed either on the LCD display as numeric values (battery's voltage at each point of time) *OR* by printing out the discharge curve, through a COM port (RS232 port), to a computer and opening it in spreadsheet (.csv) format.

Below is a sample of a test output spreadsheet (.csv) file opened and plotted using Microsoft Excel™:

Press 'p' to start print.

Time (Secs)	Discharge Curve (Volts)	Reference Curve (Volts)	Percent Diff
0	115.8378597	115.9	0.054
1	113.3601474	113.5	0.123
2	111.3332232	111.6	0.239
3	110.7533682	111.2	0.402
:	:	:	:
:	:	:	:
57	99.61061075	105.7	5.761
58	99.44293411	105.7	5.92
59	99.58942138	105.9	5.959

**INSTRUCTIONS FOR *BATTERY INFORMER* SERIES**

**BI Test Results**

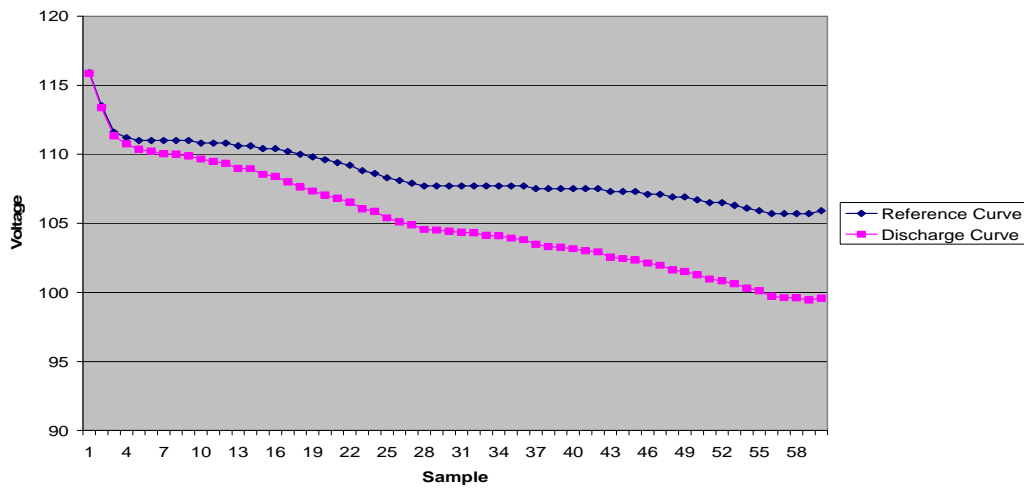


Table 1 depicts how the load test indicates the state of the battery and when the summary relay and auto equalize change state.

Condition of Battery system	Front panel indications	Sum fail relay	Remote Auto EQ Initialization
Good	<b>GREEN</b> "Pass"	NO	NO
Slightly sulfated/loose connection	<b>GREEN</b> "Pass" and <b>RED</b> "Check Battery System"	YES	NO
Heavy sulfation/loose connection	<b>RED</b> "Check Battery System"	YES	YES
Open cell(s) Open circuit	<b>RED</b> "Open Cell"	YES	NO

**TABLE 1**

## CUSTOMER CALIBRATION MODE

To access the Customer Calibration Mode, press both Up and Mode buttons (press the Up button first - the LCD display should change, hold it down and then press the Mode button) for about 5 seconds after "Customer Calibration Mode" appears on the LCD display release both buttons.

### **Equalize Cycle**

Adjustable: 1-144 hours  
(Determines how long the battery's equalize cycle period is set to)



### **Auto Test Cycle**

Adjustable: 1-120 days



### **Display Discharge Curves**

- Yes
- No

(The discharge curve can be displayed either on the LCD display as numeric values (battery's voltage at each point of time) OR through a COM port to a computer)



### **Reference Window**

Adjustable: 0 – 5%  
(The acceptable voltage drop margin below the reference curve at which below the BI creates an alarm signal)



### **Reset the count of the taken tests**

- Yes
- No



## INSTRUCTIONS FOR *BATTERY INFORMER* SERIES

### Test Length

Adjustable: 1-3 minutes  
(The BI captures 60 samples of battery's voltage for any test length)



### Backlight of the LCD Display

- Automatically turns off if not used for 2 minutes
- Always on



### Modbus Address

- Address number (RTU Modbus)
- All – used with Option 21P/21Q (DNP 3.0, Modbus ASCII, Modbus RTU, Modbus TCP)

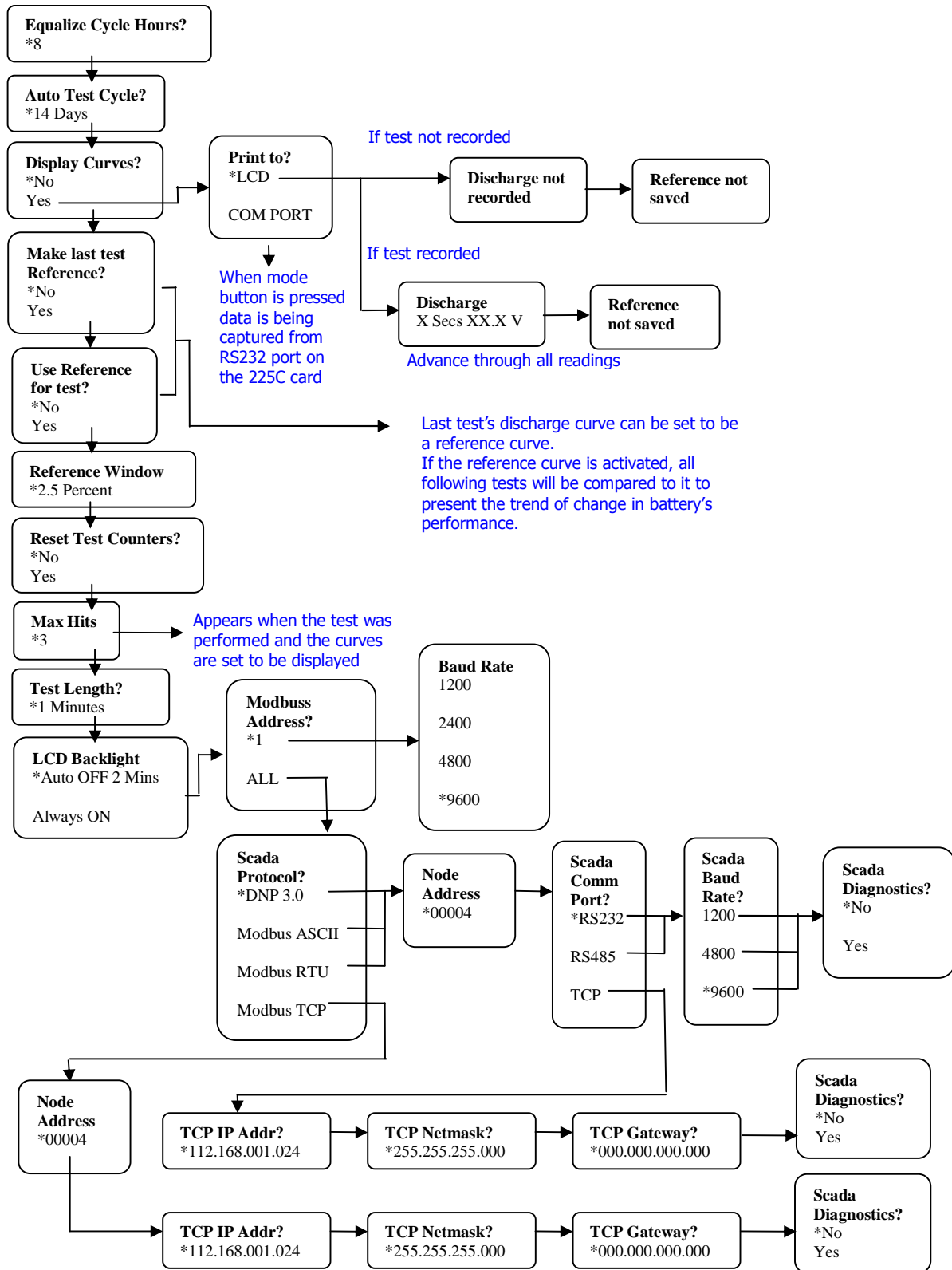


### Baud rate

- 1200, 2400, 4800, 9600



# CUSTOMER CALIBRATION MODE



\* - Default Setting

## RELAY CONTACTS

The Battery Informer has four (4) set of dry Form "C" contacts inside the unit.

Summary Alarm contacts change state under three (3) conditions:

1. If the battery fails the informer test.
2. If an open cell is detected.
3. If incorrect battery is connected.

Remote Auto-Equalize contacts are used to put a charger/rectifier in equalize for a period of time selectable from the front panel factory set at eight (8) hours.

The Battery Informer is equipped with a Charger Inoperative Alarm, if the battery voltage falls to below 2.05 V/C (1.28 V/C NC) the Alarm will activate (charger is likely to be in a power failure mode). The Battery Informer will not perform any test for at least 12 hours and it will trigger the "Remote Auto-Equalize" contacts for default of 8 hours. (The remote auto-equalize time can be changed during set-up)

Tester Failure Alarm contacts will change state if the informer test fails either under manual or automatic operation.

*NOTE: See label on door for relay contacts arrangement.*

The Maximum Contact Ratings for the above relays are:

Maximum Switched Current	2 Amps AC or DC
Maximum Switch Voltage	150 Vdc or 125 Vac
Maximum Switch Power	30 Watts or 62.5 Va

## BATTERY INFORMER – SELF TEST

If the Battery Informer detects an internal problem, the "Tester Failure" LED will light and the display will show "Tester Failure". The Summary contacts will change state and the auto feature will be disabled. The load will not get disrupted and will stay normally powered by the battery and the charger. Consult LaMarche Service Department for troubleshooting.

## OPTIONAL FEATURES

1. Option 21P, 21Q - Scada interface with DNP 3.0 and Modbus protocol. Refer to the Battery Informer Scada Interface with DNP 3.0 and Modbus instruction manual.
2. Option 068 - Audible alarm with a silence switch. A signaling device is connected to the Summary Alarm dry Form "C" contacts.

## General Maintenance Procedure

### Yearly

1. Blow out relay contacts with a low-pressure air hose.
2. Make sure all connections are tight.
3. Perform a visual check on all internal components.
4. Check front panel display and alarms for accuracy.
5. Check relay contacts for pitting or corrosion.

## MANUFACTURER'S WARRANTY

All La Marche Manufacturing Co. equipment has been thoroughly tested and found to be in proper operating condition upon shipment from the factory and is warranted to be free from any defect in workmanship and material that may develop within two (2) years from date of purchase under normal use.

If the equipment proves defective within a two year period, it shall be replaced without charge after examination at our factory, providing such defect in our opinion, is due to faulty material or workmanship and not caused by tampering, abuse, misapplication or improper installation.

Should the equipment require major replacement or repair, the equipment must be returned to the La Marche factory to have the inspections, parts, replacements and testing performed by factory personnel. Should it be necessary to return a piece of equipment to the factory, the customer or Sales representative must first obtain a RMA (Return Material Authorization) from the factory. If upon inspection at the factory, the defect was due to faulty material or workmanship, all repairs will be made at no cost to the customer during the warranty period.

La Marche reserves the right to honor the warranty with a replacement unit.

In accepting delivery of the equipment, the purchaser assumes full responsibility for proper installation, installation adjustments and service arrangements. Should minor adjustments be required, the local La Marche Sales Representative should be contacted to provide this service.

All sales are final. Only standard LaMarche units will be considered for return. A 25% restocking fee is charged when return is factory authorized. Special units are not returnable.

In no event shall La Marche Manufacturing Co. have any liability for consequential damages, or loss, damage or expense directly or indirectly arising from the use of the products, or any inability to use them either separately or in combination with other equipment or materials, or from any other cause. In addition, any alterations of equipment made by anyone other than La Marche Manufacturing Co. renders this warranty null and void.

La Marche Manufacturing Co. reserves the right to make revisions in current production of equipment, and assumes no obligation to incorporate these revisions in earlier models.

The failure of La Marche Manufacturing Co. to object to provisions contained in customers' purchase orders or other communications shall not be deemed a waiver of the terms or conditions hereof, nor acceptance of such provisions.

The above warranty is exclusive, supersedes and is in lieu of all other warranties, expressed or implied, including any implied warranty of merchantability or fitness. No person, agent or dealer is authorized to give any warranties on behalf of the Manufacturer, nor to assume for the Manufacturer any other liability in connection with any of its products unless made in writing and signed by an official of the manufacturer.