



UNIVERSAL CHARGER

General Manager SW User Manual

www.seven-segments.com



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1. Introduction

Aim of this document is to create a reference for the software for Universal charger general management. This manual is intended as an help for the software usage and give also a reference for new programs development.

To have more detail about the Universal Charger please refer to the following documents:

1. Universal Charger – Firmware User Manual
2. Universal Charger – Technical Description
3. Universal Charger – General Manager SW (this document)
4. Universal Charger – Display SW



2. Before running the program

The minimum system requirements to run this software are the following:

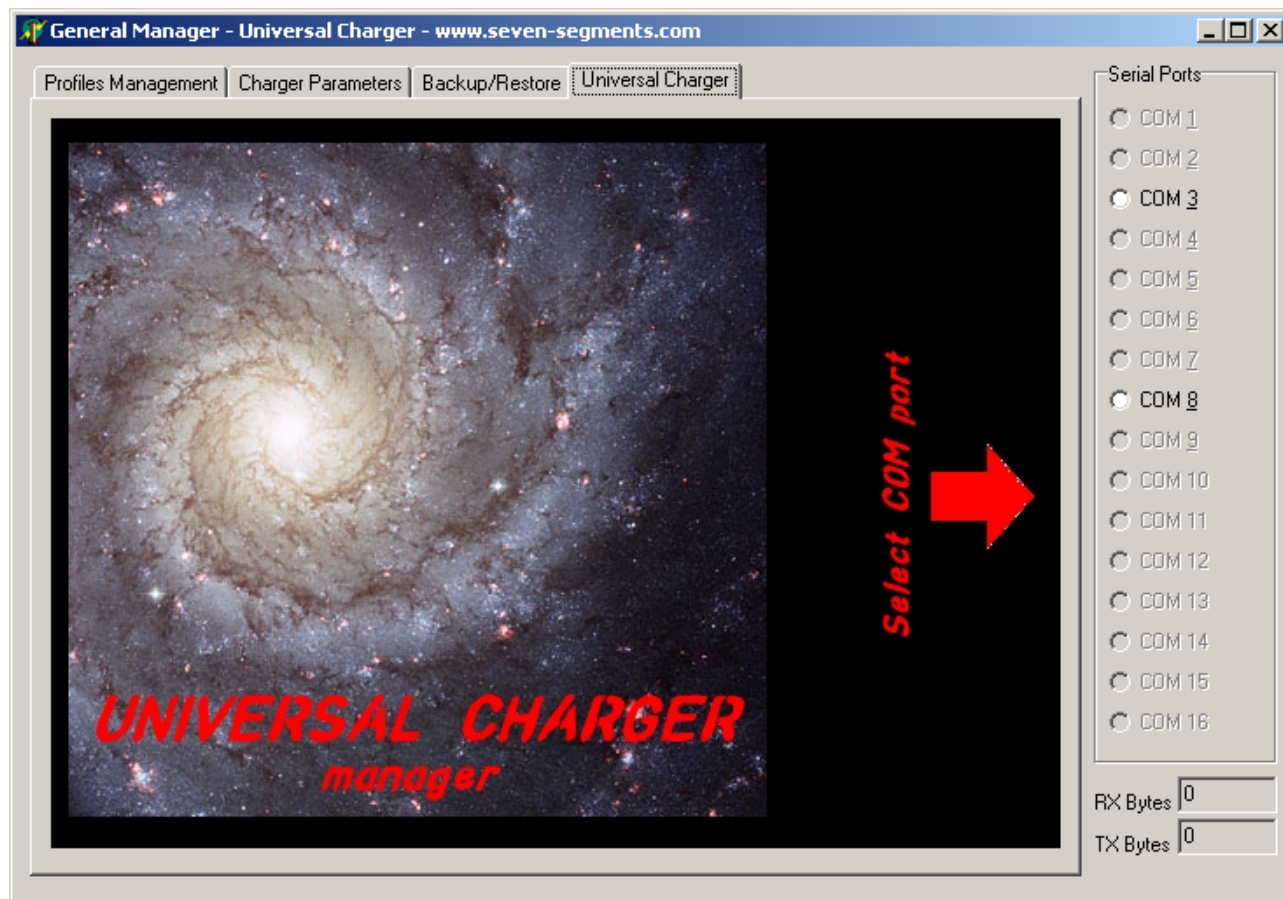
- PC compatible running Windows 2000 or XP
- 256MB of RAM memory
- 2GB of hard disk
- XVGA display with 1024x768 resolution, 256 colors
- 1 serial port (or emulator via USB)

Before the program run, simply copy the executable file in a dedicated folder: at this point the program can be run.



3. Page "Universal charger"

This page is the first displayed after the program start.



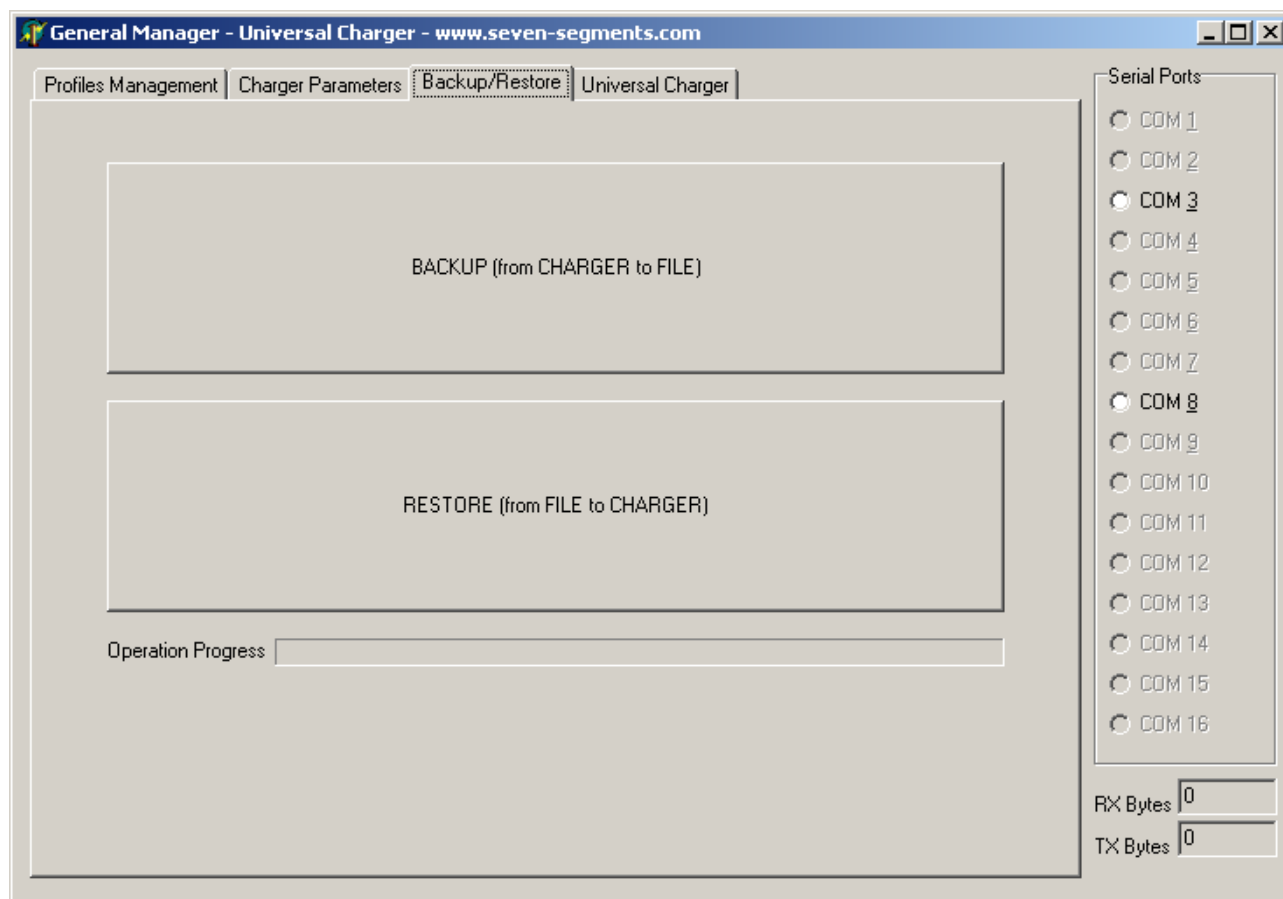
The first step is to choose the serial port for charger connection: the COM1 - COM16 ports are displayed on the right bar, with in evidence only the ports available and active on the computer. Select the port that is physically connected to the charger clicking on the name.

Once selected the serial port the user can go to the following pages.



4. Page "Backup and Restore"

This page allows the user to backup and restore the **complete** configuration of the charger. The **Backup** function copy all the charger parameters on a file, the **Restore** function copy the parameters from a file to the charger.



The progress bar on the bottom of the page shows the operation progress. The user dialog box propose a ".universal" extension for this backup file but the user can specify an arbitrary name.

Important: the backup of the charger configuration save all the charger parameters and all the profiles parameters, allowing a complete solution to restart the system with a predefined state.

Important: the restore of the charger configuration overwrites the present charger configuration with no recovery possibility.



5. Page "Charger Parameters"

This page allows to read/modify the general charger parameters (the parameters common to all the profiles).

The screenshot shows the 'Charger Parameters' window with the following details:

- Actual Profile:** 0 (Selected profile: 0:profile 1 ...11:profile 12, 255:default)
- MAX charge Current:** 5 (Ampere (integer from 0 to 255))
- MAX Discharge Current:** 20 (Ampere (integer from 0 to 255))
- Buzzer Frequency:** 2000 (Hz (integer from 50 to 10000))
- R6:** 12000 (Ohm (Integer from 0 to 65535))
- R5:** 47000 (Ohm (Integer from 0 to 65535))
- Current pick-up sens.:** 25000 (mV/A (Integer from 0 to 65535))
- Suspended action:** 0 (0: Idle, 1:Charge, 2:Discharge)
- First hello line:** .seven-segments. (MAX 16 char)
- Second hello line:** www. .com (MAX 16 char)

Buttons: READ from CHARGER, WRITE to CHARGER

Serial Ports: COM 1, COM 2, COM 3, COM 4, COM 5, COM 6, COM 7, COM 8, COM 9, COM 10, COM 11, COM 12, COM 13, COM 14, COM 15, COM 16

RX Bytes: 0, TX Bytes: 0

The "READ from CHARGER" button reads all the parameters on this page from the charger and display the data. The "WRITE to CHARGER" button writes the data displayed (eventually edited by the user) into the charger. The small progress bar below the buttons shows the progress of the commanded action.

Important: the write operation is composed by a write and a successive read in order to re-display (for check) the data entered by the user, giving a feedback of the charger status.



The parameters reference table is the following:

Parameter	Interval	Remarks
Actual Profile	0..11	This parameter is the selected profile into the charger. Changing this value has the same effect that a selection performed with the "Profile select" inside the charger. The "actual profile" parameter is used by the charger for charge, discharge or editing.
MAX charge current	0..255	Maximum charge current in Ampere. A charge current greater than this parameter will be saturated at this maximum value.
MAX discharge current	0..255	Maximum discharge current in Ampere. A discharge current greater than this parameter will be saturated at this maximum value.
Buzzer frequency	50..10000	Buzzer frequency in Hertz. This frequency should be adapted the resonant frequency of the charger buzzer.
R6	0..65535	Partitor resistor in Ohm. See the figure on this page for more details.
R5	0..65535	Partitor resistor in Ohm. See the figure on this page for more details.
Current pick-up sens.	0..65535	Current pick-up sensitivity in $\mu\text{V}/\text{A}$: LTS-25NP: typical 25000 ACS750-50: typical 40000
Suspended action	0..2	Writing a value different from 0 (idle) in this parameter force the charger to restart a selected action when powered up: 1: charge 2: discharge
First hello line	ASCII	First line of the "Hello message" displayed by the charger when powered up. This string has a length of 16 characters.
Second hello line	ASCII	Second line of the "Hello message" displayed by the charger when powered up. This string has a length of 16 characters.



6. Page "Profiles Parameters"

This page allows to read/modify the individual profile charger parameters (the parameters that can be changed profile by profile).

Parameter	Value	Unit / Range
Cell Chemistry	0 - NiCd	Cell type
Cell Capacity	3000	mAh (integer from 100 to 25500)
Number of cells	6	(integer from 1 to 19)
Charge Current	1.0	in function of Capacity (format xx.x from 0.1 to 25.5)
Discharge Current	4.0	in function of Capacity (format xx.x from 0.1 to 25.5)
Charge Peak inh.	5	Minutes (integer from 0 to 255)
Cutoff NiCd	800	mV (integer from 0 to 2550)
Cutoff NiMh	1000	mV (integer from 0 to 2550)
Cutoff LiPo	3000	mV (integer from 2500 to 3500)
Cutoff SLA	2000	mV (integer from 1500 to 2500)
Delta Peak NiCd	10	mV (integer from 0 to 255)
Delta Peak NiMh	5	mV (integer from 0 to 255)
Max Voltage LiPo	4200	mV (integer from 3500 to 4500)
Max Voltage SLA	2500	mV (integer from 2000 to 3000)
Final Curr LiPo	5	% of the Charge Current (integer from 0 to 255)
Final Curr SLA	5	% of the Charge Current (integer from 0 to 255)
MAX Charge	120	% of the Capacity (integer from 0 to 255)

The "READ from CHARGER" button reads all the parameters on this page from the charger and display the data. The "WRITE to CHARGER" button writes the data displayed (eventually edited by the user) into the charger. The small progress bar below the buttons shows the progress of the commanded action.

Important: the write operation is composed by a write and a successive read in order to re-display (for check) the data entered by the user, giving a feedback of the charger status.



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The parameters reference table is the following:

Parameter	Interval	Remarks
Cell chemistry	0..3	Type of cell chemistry for this profile: 0:NiCd, 1:NiMh, 2:LiPo, 3:SLA
Cell capacity	100..25500	Capacity of the cell pack, expressed in mAh. To be specified in multiples of 100mAh.
Number of cells	1..19	Number of cells or series elements.
Charge current	0.1 .. 25.5	Charge rate, specified as multiplier for the capacity. A rate of 1.0 cause a charge current equal to the capacity expressed in mA. Typical value 1.0: very few batteries allows a charge rate greater than this limit.
Discharge current	0.1 .. 25.5	Discharge rate, specified as multiplier for the capacity. A rate of 4.0 cause a charge current equal to 4 times the capacity expressed in mA. Typical value 4.0-6.0 in order to discharge a full charged battery in 10-15 min.
Charge peak inhibit.	0 .. 255	The charger inhibit the delta peak control for this specified number of minutes after the start of the charge. Typical value from 5 to 10 min, increase in case of batteries not used for very long time.
Cutoff NiCd	0..2550	Minimum voltage for the discharge process expressed in mV/cell. The discharge will terminate when the battery pack voltage is under the (Cutoff*Number of cells). Typical value 700..900 mV.
Cutoff NiMh	0..2550	Minimum voltage for the discharge process expressed in mV/cell. The discharge will terminate when the battery pack voltage is under the (Cutoff*Number of cells). Typical value 900..1100 mV.
Cutoff LiPo	2500..3500	Minimum voltage for the discharge process expressed in mV/cell. The discharge will terminate when the battery pack voltage is under the (Cutoff*Number of cells). Typical value 3000mV.
Cutoff SLA	1500..2500	Minimum voltage for the discharge process expressed in mV/cell. The discharge will terminate when the battery pack voltage is under the (Cutoff*Number of cells). Typical value 2000mV.
Delta peak NiCd	0..255	Delta peak (mV/cell) used for the costant current charge finish. Typical value 5..10mV.
Delta peak NiMh	0..255	Delta peak (mV/cell) used for the costant current charge finish. Typical value 3..7mV.
Max. voltage LiPo	3500..4500	This voltage represent the maximum voltage(in mV) of the cell in the charge process. At this point the charger switches from constant current to constant voltage charge method. Typical value 4200mV.
Max. voltage SLA	2000..3000	This voltage represent the maximum voltage(in mV) of the cell in the charge process. At this point the charger switches from constant current to constant voltage charge method. Typical value 2500mV.



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Final curr. LiPo	0..255	This parameters is expressed in % with respect to the initial charge current, and is used by the charger to stop the charge when in constant voltage mode. Typical value 3..20%.
Final curr. SLA	0..255	This parameters is expressed in % with respect to the initial charge current, and is used by the charger to stop the charge when in constant voltage mode. Typical value 3..20%.
Maximum charge	0..255	This parameters is expressed in % with respect to the pack capacity. The charge will stops when the charger has passed this capacity to the cells. Used as timeout (typ. value 120) or to shorten the charge time (with not full battery charge) (typ. 70-80 for 45 min. LiPo charge)