

# MSRComms

Communications Software for MSRx Charge Controllers

## User Manual

The screenshot displays the MSRComms Communication Module interface for an MSR4 24V NE controller. The interface includes a menu bar with options like Get Status, Print Status, Data Log, Upload, Settings, About, and Exit. The main display area is divided into several sections:

- BATTERY:** Shows a voltage of 26.2V, a temperature of 28°C, and a Boost button. A progress bar indicates the battery level between 22V and 30V.
- Alarms:** Lists various alarm types such as Common Alarm, Battery Sense, Temp Sensor, Array Fail, Low Charge, High Volts, Low Volts, Load Cut 1, and Load Cut 2, each with a status indicator.
- Settings:** Provides adjustable settings for Hi Volts Set (30.0 V), Lo Volts Set (23.4 V), Load Cut 1 Set (22.8 V), and Load Cut 2 Set (22.2 V), each with a corresponding Reset value.
- ARRAY CURRENT:** Shows a current of 98.6A. It includes a status bar for four arrays (1-4) and voltage readings for each (39.7, 39.8, 40.1, 39.9). It also displays current and AmpHours for two loads.
- LOAD CURRENT:** Shows a current of 14.2A.
- Regulation Settings:** Includes settings for Boost (29.4 V), Equalise Period (30 Mins), Float (27.5 V), Hours since last AmpHour Reset (329), Total Controller Run Time (438), and Controller Time (2011-10-10 11:49).
- Connection Type:** Shows Direct RS232, Demo Mode, and Port COM 3. A status indicator shows Online.
- Serial Data:** A scrollable area at the bottom right displays hexadecimal data: 80000000000000000000000000000011, 11000011262+285397398, 401389235235235235-, 508, 142021641001098000329, 0004380000END#.

## **Installation**

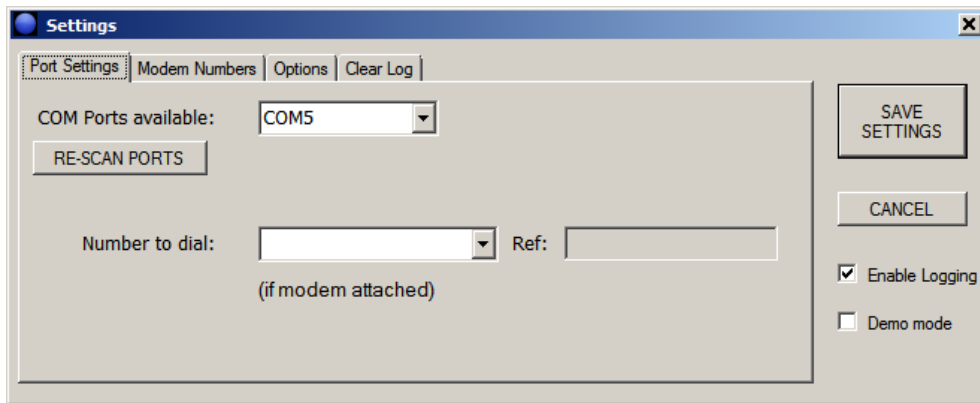
The installation package contains two files, **setup.exe** and **MSRCommsSetup.msi**, which should be unzipped into a temporary folder. Run the setup program and accept the default location of ...\\Program Files\\Micha\\ for the installation.

During installation, two files are copied to the Windows directory, wsc32.dll and mio32.dll. These two files are essential to the operation of the software and should not be moved. A directory for 'working' files is also created at C:\\Documents and Settings\\username\\My Documents\\MComms into which reports are saved.

Note: This software requires Microsoft's **.NET Framework 4.0** to run. If it is not already installed on your computer, you will be prompted to download it before the installation can continue. It can be manually downloaded from: <http://www.microsoft.com/Net/Download.aspx>

## **Setup**

When the program is run for the first time, you will be warned that no communications port has been selected. Click on Settings and the following window will appear:



Click on **RE-SCAN PORTS** and all available RS232 ports should be detected. Select the appropriate port from the drop-down box, e.g. 'COM4', and click on **SAVE SETTINGS**. If a modem is detected, this will be indicated with (M) shown as 'COM4 (M)'. Up to five modem numbers can be entered by clicking on the 'Modem Numbers' tab - these will then be available for selection in the 'Number to dial' drop down box.

Note: all settings are saved and will not need to be entered again.

The '**Enable Logging**' option allows a log of all communications to be made and it is recommended that this option is kept enabled to allow for any debugging of the setup or communications. Additionally, all raw data is shown in a scrolling window in the communications panel bottom right of the main screen.

The '**Demo mode**' option allows the software to run in demonstration mode without connection to a controller.

**Get Status**

With an RS232 connection made to the controller, click on 'Get Status'. (Note that all commands can also be accessed using the keyboard by pressing the Alt key and the underlined letter - in this case 'G'.) Requests for the controller's Data and Settings are sent and received, decoded, and displayed as in the example below:

The screenshot shows the 'Micha' software interface for an 'MSRx4 24V NE' controller. The main display shows a battery voltage of 26.2V with a bargraph ranging from 22V to 30V. Below the voltage, there are indicators for '28°C' and 'Boost' mode. To the right, there are 'Alarms' and 'Settings' sections. The 'Alarms' section shows 'Common Alarm', 'Battery Sense', 'Temp Sensor', 'Array Fail', and 'Low Charge' all as '-'. The 'Settings' section shows 'Hi Volts Set' at 30.0V, 'Lo Volts Set' at 23.4V, 'Load Cut 1 Set' at 22.8V, and 'Load Cut 2 Set' at 22.2V. Below these are 'Arrays' and 'Loads' sections. The 'Arrays' section shows four arrays with status 'C' and voltages ranging from 39.7V to 40.1V. The 'Loads' section shows two loads with status 'C' and a current of 14.2A. At the bottom, there are 'Regulation Settings' including 'Boost' at 29.4V, 'Float' at 27.5V, and 'Controller Time' at 2011-10-10 11:49. A 'Connection Type' panel shows 'Direct RS232' and 'Port: COM 3' with an 'Online' indicator.

The bargraph below the Battery voltage has markers for the Float and Boost settings allowing a quick evaluation of the battery status and this panel also displays the measured Battery temperature, and present regulation mode.

Any active alarms are highlighted in red, and the Array and Load switches are colour-coded to display their status:

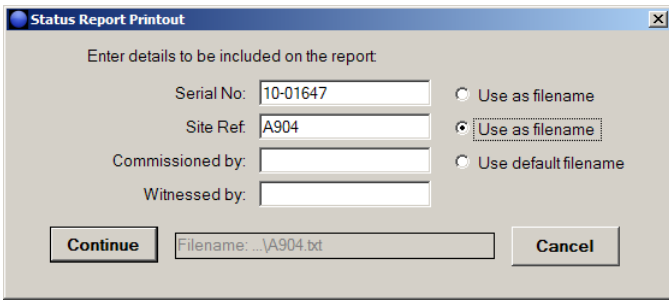
This close-up shows the 'Alarms' and 'Settings' sections. In the 'Alarms' section, 'Common Alarm' is 'ON' (highlighted in red), while 'Battery Sense', 'Temp Sensor', 'Array Fail', and 'Low Charge' are '-'. In the 'Settings' section, 'Hi Volts Set' is 30.0V, 'Lo Volts Set' is 23.4V, 'Load Cut 1 Set' is 22.8V, and 'Load Cut 2 Set' is 22.2V. Below this are the 'Arrays' and 'Loads' sections. The 'Arrays' section shows four arrays with status 'O' (green) and voltages of 25.3V, 25.3V, 25.2V, and 25.3V. The 'Loads' section shows two loads with status 'O' (red) and 'C' (green) and a current of 0.0A.

To allow for better visibility under various conditions, the background colour of the Battery Voltage, Array Current and Load Current displays can be changed by clicking on the word 'BATTERY':

This close-up shows the 'BATTERY' display with a mouse cursor clicking on the word 'BATTERY'. The background of the display is yellow, and the voltage '26.2V' is also in yellow. Below the voltage, there are indicators for '28°C' and 'Boost' mode. The bargraph below the voltage is also yellow.

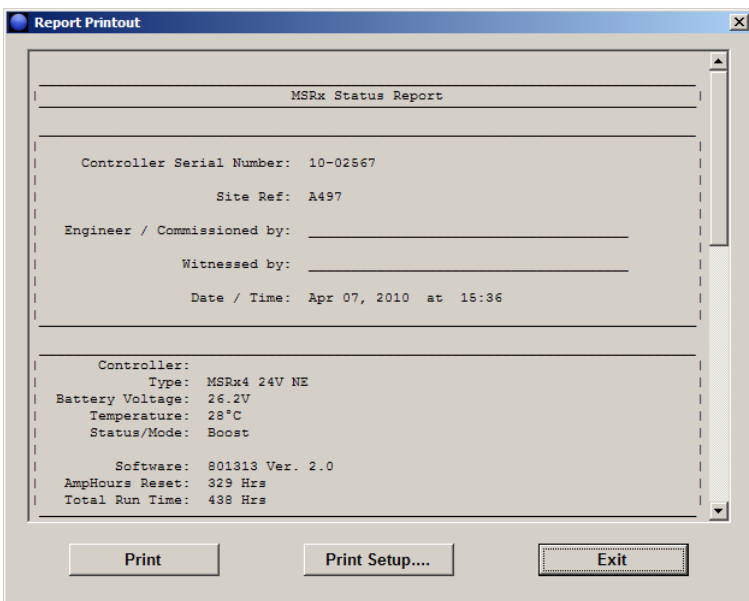
**Status Report Printout**

Once a download has been made, the user can create a report that can be saved and printed. Click on 'Print Status' and the following window appears:



Details such as the unit serial number and/or site reference can be included. Clicking on 'Continue' automatically saves the report with the filename selected - by Serial Number, Site Reference or the default 'Report' - as a text file in the MComms folder. The filename to be used is displayed in the window - in the example above, it will be saved with the default filename.

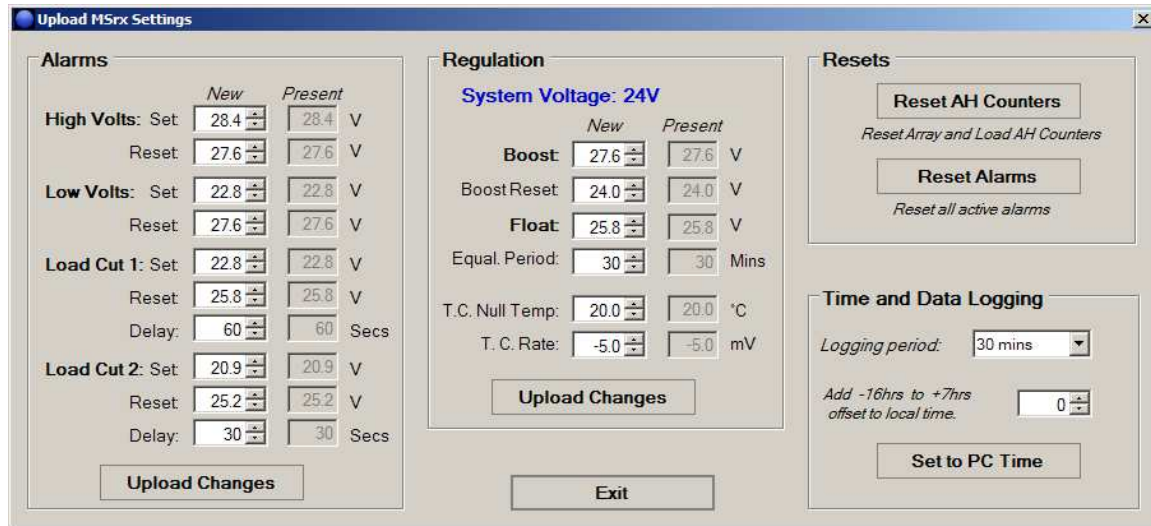
The user is then presented with a preview of the report, which can now also be printed:



Note: If the default filename of 'report.txt' is used, this will be over-written each time a report is generated.

## Upload

Various parameters can be changed and uploaded to the MSRx controller from the 'Upload' window:



**Alarms:** The Set and Reset voltage settings can be changed for the High Volts and Low Volts alarms, as well as the Disconnect, Reconnect and Delays for Load Cut 1 and Load Cut 2.

**Regulation:** The Boost, Reset to Boost and Float Voltages can be changed, as well as the Equalisation Period and Temperature Compensation settings.

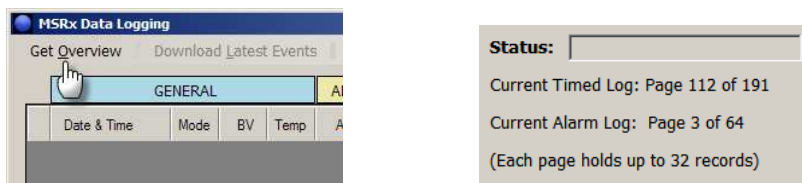
**Note:** To upload any changes, it is necessary to click on the appropriate 'Upload Changes' button within each panel.

**Resets:** By clicking on 'Reset AH Counters', the AmpHour counters for both Array and Load readings are set to zero. Note: this operation is irreversible. Clicking on 'Reset Alarms' will attempt to reset any active alarms where the Battery voltage is between the Set and Reset voltages. If the Battery voltage for an alarm is still valid, the alarm will remain active.

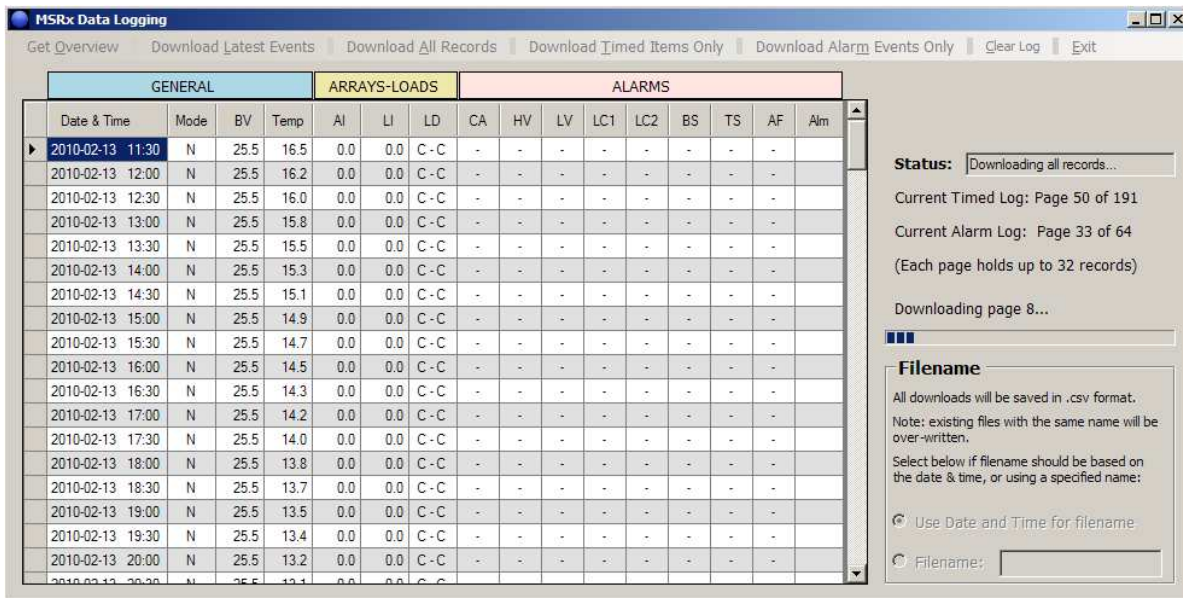
**Time and Data Logging:** The existing Logging Period is displayed and can be changed to any of the allowed intervals of 15, 30 or 60 minutes when setting the controller time. Additionally, to allow the user to set the controller's clock to show local time in a different time zone, an offset can be included. Note: the number of hours offset allowed depends on the current time to keep the change within the same day. For example, if the connection time is 13:48, the allowed offsets would be -13hrs to +10hrs to keep the hours within the same day.

## Data Log

If data logging is included and enabled on the controller, a past history can be downloaded. In the main screen, click on 'Data Log'. In the Data Logging window, click on 'Get Overview' and the status of the Logs will be displayed.



The controller history is divided into two sections. The first 191 'pages' of 32 records are timed at the preset logging period, and there are 64 pages of Alarm records made at the time of any relevant alarm event. Once the overview has been downloaded, the options available are to download All records, just the Timed records, or just the Alarm records. Additionally, downloading the Latest events allows the user to see only the most recent history. Note: As the data is downloaded in pages or blocks of 32 records, the number of 'Latest' records can vary between 33 and 64, depending on how many records have been stored on the current and previous pages of data.



Once a download has been made, the data is displayed in table format as above and can be sorted by various categories by clicking on the column header. For example, to sort the data by Battery Voltage, click on the 'BV' header.

Note: Downloading each page of data takes between 2-3 seconds and therefore a download of 100+ pages can take several minutes. Each record is checked for validity and is requested again if errors in the data are detected. If the download is corrupted or incomplete, the program will make three attempts to obtain valid data and has a built-in timeout of 10 seconds while waiting for valid data.

Each download is automatically saved as a CSV (comma separated variable) file which can be readily opened in Microsoft Excel or other spreadsheet program. If no specific filename is entered, the file is saved with a default filename comprising the date and time in the format yy mm dd hh mm - e.g. 1004071536 represents a download made at 15:36 on 7<sup>th</sup> April 2010.

### CSV File Format:

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1	Date	Time	Mode	BV	Temp	AI	LI	LD1	LD2	CA	HV	LV	LC1	LC2	BS	TS	AF	Rec No
2	06/12/2010	11:00	N	26.2	18.8	38.1	12.3	C	C	-	-	-	-	-	-	-	-	1697

When opened in Microsoft Excel, the CSV files appear as 18 columns with the following headers:

- |                                   |   |
|-----------------------------------|---|
| <b>Date :</b> dd/mm/yyyy          | <b>LD1 :</b> Load switch 1: C = Closed / O = Open             |
| <b>Time :</b> hh:mm in 24h format | <b>LD2 :</b> Load switch 2: C = Closed / O = Open             |
| <b>Mode :</b> B = Boost           | <i>The following alarms are marked with an 'A' if Active:</i> |
| D = Disabled                      | <b>CA :</b> Common Alarm                                      |
| E = Equalisation                  | <b>HV :</b> High Volts Alarm                                  |
| F = Float                         | <b>LV :</b> Low Volts Alarm                                   |
| N = Night                         | <b>LC1 :</b> Load Cut 1 Alarm                                 |
| T = Test                          | <b>LC2 :</b> Load Cut 2 Alarm                                 |
| <b>BV :</b> Battery Volts         | <b>BS :</b> Battery Sense Alarm                               |
| <b>Temp :</b> Temperature in °C   | <b>TS :</b> Temperature Sense Alarm                           |
| <b>AI :</b> Array Current in Amps | <b>AF :</b> Array Fail Alarm                                  |
| <b>LI :</b> Load Current in Amps  | <b>Rec No :</b> Sequential Record Number                      |

The Record Number is the actual file number of each line. There are 191 'pages' of 32 timed records, and these are numbered 1 to 6112 (191 x 32). There are 64 'pages' of Alarm records, 2,048 in total, and these are numbered 6113 to 8160. If the data is sorted on Date, Time and Rec No, the record number ensures the alarms appear in the correct chronological order.

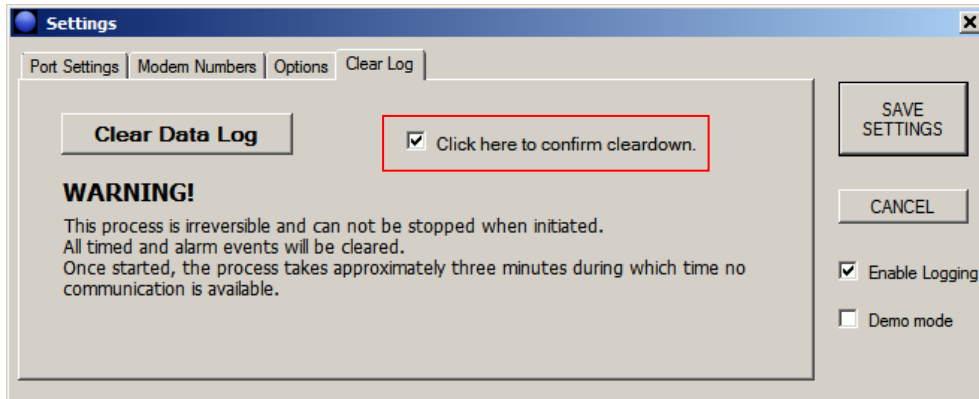
Note: The format of the Date may appear differently, for example as mm/dd/yy. This is determined by the user's settings in their Regional and Language Options as set up on their PC.



## **Clearing the Data Log**

The Data Log can be cleared down if necessary. Click on the Settings, and then select the 'Clear Log' tab.

Warning: This process is irreversible and can **not** be stopped when initiated.



To start the data cleardown, tick the confirmation box and then click on 'Clear Data Log'. During cleardown, all communications with the MSRx controller is disabled.

Note: Immediately after a cleardown, there are no records in the historical log. Attempting to access the log via the Data Log window may initially report an error until the first timed record is saved. (To save waiting time, the user can temporarily set the log interval to 15 minutes.)

## **Software Version History**

The version of software being used can be viewed by clicking on 'About' on the main screen.

<b>Version</b>	<b>Release Date</b>	<b>Comment</b>	<b>Manual</b>
1.0.1.0	09-Apr-2010	First release	801681-A
1.0.1.3	13-Apr-2010	Fix to prevent overlapping values being uploaded.	801681-B
1.0.2.1	03-Dec-2010	Reports folder now created in C:\Documents and Settings\username\My Documents\MComms to avoid issue with permissions. Added option to run as Demo Add option to select controller address number.	801681-C
1.0.3.1	10-Oct-2011	Minor change to improve performance, update to user manual	801681-D
1.0.4.1	10-Aug-2012	Microsoft .NET 4 required Added option to clear down data Log	801681-E