



**OPERATING MANUAL
X200 COMPACT INTEGRATED
DC POWER SYSTEM**

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COMPACT INTEGRATED DC POWER SYSTEM X200 SERIES

1.0 INTRODUCTION

Gravitas X200 is an ultra-compact, medium power, high efficiency integrated DC power system. The base system is a 2RU shelf holding up to four hot-swap rectifier modules. This system is rated to supply up to 148A at -54.4VDC and 200A at +27.2VDC or +13.6VDC. The expanded system consists of a base 2RU system integrated with an additional rectifier shelf making 3RU total height. This system holds up to eight rectifier modules with up to 200A of redundant or non-redundant output at all voltages. Each rectifier module is cooled by a fan that operates at a speed which is a function of load and temperature.

There are ten dedicated circuit-breaker protected DC outputs on the system. Two battery string breakers are available and if not required can also be configured as two additional load circuits with high current breakers. A low-voltage battery disconnect is an optional feature.

The remote access controller is field replaceable while the system is operating normally. The system has LED visual indicators and Form C relay alarms. It is programmed by means of a remote PC web page display with communication by Ethernet LAN. An optional LCD display/touchpad allows local access if required. Temperature compensated rectifier output is provided by means of an accessory TC probe. The X200 can be quickly installed by a qualified technician.

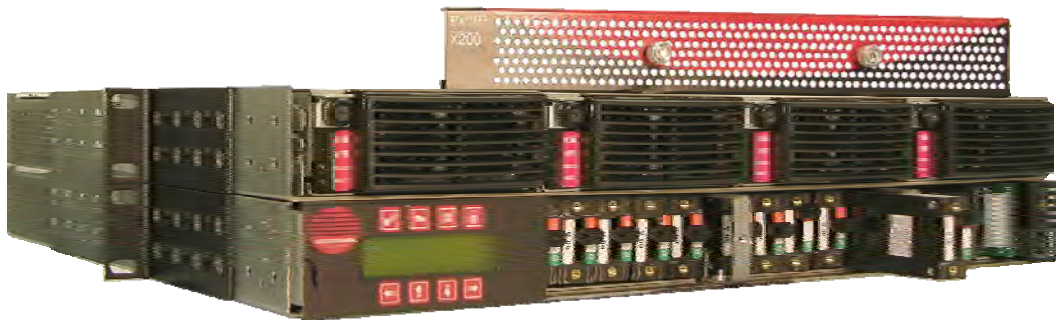


Figure 1 - X200 Compact Integrated DC Power System

2.0 FEATURES AND OPTIONS

2.1 Standard Features

- ◆ 2RU High Base System (up to 4 rectifiers)
- ◆ 3RU High Expanded System (up to 8 rectifiers)
- ◆ High Efficiency Rectifiers (91%)
- ◆ Remote Control & Monitoring via TPC/IP Ethernet LAN
- ◆ Field Replaceable Controller
- ◆ Up to 200A at -54.4VDC, +27.2VDC or +13.6VDC
- ◆ Wide Range AC Input
- ◆ Up to 12 DC Load Circuits
- ◆ High Capacity Pluggable Circuit Breakers
- ◆ Quick and Easy Installation
- ◆ 19-Inch Rack Mounting

2.2 Options & Accessories

- ◆ Low Voltage Disconnect ('L' Option)
- ◆ LCD Display/Touchpad ('D' Option)
- ◆ SNMP reporting and Error Trapping ('S' Option)
- ◆ Additional Temperature Probe for External Temperature Measurement

3.0 SAFETY WARNINGS

- 3.1** The X200 Compact DC Power System operates at voltages that could potentially be hazardous. Furthermore, inadvertent short circuiting of the system battery and/or rectifier by misconnection or other error could be harmful. This product should be handled, tested and installed only by qualified technical persons who are trained in the use of power systems and are well aware of the hazards involved.
- 3.2** When operating the X200 the chassis ground terminal must be connected to the system frame ground or other proper safety ground for the protection of personnel.
- 3.3** All connections to the X200 should be carefully checked for errors before applying power to it.
- 3.4** This equipment is intended only for installation in a "RESTRICTED ACCESS LOCATION".

4.0 WARRANTY (Summary)

All products of UNIPOWER Telecom, a division of UNIPOWER Corporation, are warranted for two (2) years from date of shipment against defects in material and workmanship. This warranty does not extend to products which have been opened, altered or repaired by persons other than persons authorized by the manufacturer or to products which become defective due to acts of God, negligence or the failure of customer to fully follow instructions with respect to installation, application or maintenance.

For a complete text of UNIPOWER's warranty conditions please request a copy from your local Sales Office.

5.0 UNPACKING AND INSPECTION

- 5.1 This X200 compact DC power system was carefully tested, inspected and packaged for shipment from our factory. Upon receipt the unit should be carefully unpacked and inspected for any damage in shipment.
- 5.2 If there is evidence of damage, **do not attempt to install the unit.** The freight carrier should be notified immediately and a claim for the cost of the X200 should be filed with the carrier for direct reimbursement. Be sure to include the model and serial number of the damaged unit in all correspondence with the freight carrier. Also save the shipping carton and packing material as evidence of damage for the freight carrier's inspection.
- 5.3 UNIPOWER Telecom will cooperate fully in case of any shipping damage investigation.
- 5.4 Always save the packing materials for later use in shipping the unit. Never ship the controller without proper packing.

6.0 GENERAL SPECIFICATIONS

6.1 Inputs

Supply Voltage: 85-264VAC Single Phase
Each rectifier position is supplied via an individual screw terminal block connection.

A 3-phase supply may be connected provided that the voltage presented to each individual rectifier position does not exceed 264VAC.

Supply Current: Maximum 20A per input at 85-264VAC, or 12.2A per input at 180-264VAC.

Battery Input: Direct connection to DC output bus via protection breakers.

Digital alarm inputs: Volts free contact input*

*Volts free contacts are internally pulled up to 5V with reference to rectifier negative sense, these lines should not be tied to anything other than volts free contacts or floating opto-coupler outputs.

Temperature probes: Sensor with output current proportional to temperature.

6.2 Outputs

Breaker Distribution: Up to 12 circuits, maximum 60A per circuit for positions 1-10 and 100A per circuit for positions 11 and 12.

Alarm Relay Contacts: Form C, 1A max at 30VDC.

Ethernet: 10/100 Base T

6.3 Protection

Supply Input: Each rectifier is individual fused internally on the AC input.

Battery: 100A or 125A Magnetic Circuit Breakers.

Output Distribution: According to installed circuit breakers.

Bulk DC Bus: Rectifier Current Limiting / Battery Breaker.

6.4 Safety

The X200 is compliant with UL60950-1, EN60950-1, CSA22.2-60950-1 and all other derivatives of the core IEC60950-1 standard when installed correctly within a restricted access environment.

The X200 is CE marked to indicate conformance to the European Union's Low Voltage and EMC Directive.

6.5 EMC

The X200 complies with the following Norms when correctly installed.

Conducted Emissions: EN55022, level A

Radiated Emissions: EN55022, level A

ESD: EN61000-4-2, level 4, criterion A - 8kV contact, 15kV air.

Radiated Immunity: EN61000-4-3, level 3, criterion A - 10V/m.

Surges (power ports): EN61000-4-5, level 1, criterion A - 500V

6.6 Environmental

Operating Temperature Range: -20°C to 50°C

Storage Temperature Range: -40°C to + 85°C

Humidity: 0% to 95% Non-Condensing

6.7 Physical Specification

Case Material: Steel

Finish: Clear Passivate

Dimensions: 5.25H (133) x 17.2W(437) x 18.62D(473)
Inches (mm)

Rack Width: 19 Inches. (23 Inch mounting requires rack extenders.)

7.0 FRONT PANEL DESCRIPTION

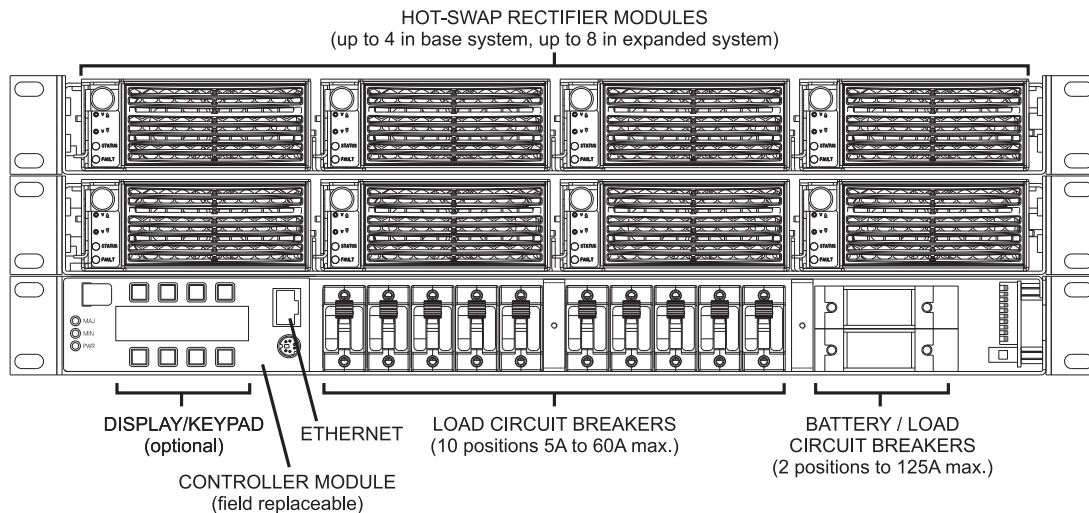


Figure 2 – Expanded System Front View with Cover Panel Removed

- 7.1** The top section contains 4 (base system) or 8 (expanded system) rectifier slots. Each slot can accept one rectifier from the BLUEstreak Series rated up to 2000W output power. Only identical model rectifiers of appropriate output voltage may be installed at the same time. For example, a nominal -48V system may contain between 1 and 8 model RBSR48/37 OR between 1 and 8 model RBSR48/28 but not a mixture of the two types.
- 7.2** Below the rectifiers at the left side the optional LCD Display/Keypad and the Ethernet port for remote communications over a TCP/IP LAN connection.
- There is also a console port which is for factory use only.
- 7.3** Across the centre of the unit is the DC distribution section which may contain between 1 and 10 pluggable circuit breakers and to the right of these are two battery breakers or high current load breakers (positions 11 & 12).
- 7.4** At the far right there is a set of DIP switches that is used to configure the system for the number of installed rectifiers.

In addition there is a slide switch to enable/disable the LVD when option 'B', Low Voltage Disconnect with override, is fitted.

Finally there are 9 LED indicators which display various status and alarm conditions. These are described in more detail in section 9.

8.0 REAR PANEL DESCRIPTION

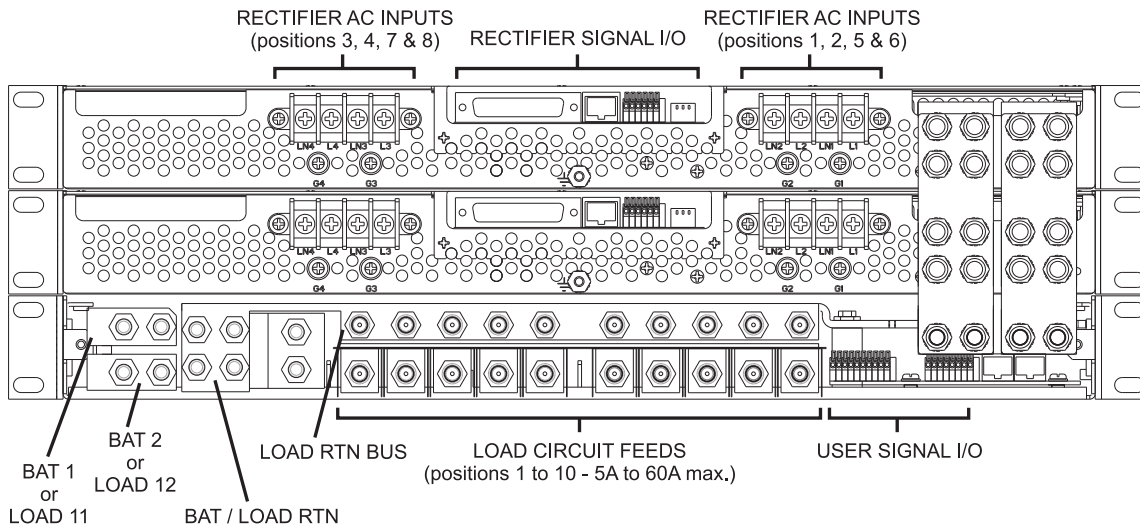


Figure 3 – Expanded System Rear View

8.1 The rear view of the expanded 3RU system is shown. The top two shelves will accommodate up to 4 rectifiers per shelf for a total of 8 rectifiers. The 2RU bases system has only one shelf for a total of 4 rectifiers.

The signal I/O shown at the centre of the rectifier shelves is for internal control & system communications between the rectifier and main system shelves.

At the far right are two bus bars that feed the DC from the rectifier shelves to the main system shelf. No external connections may be made to these bus bars and the bolted connections must not be altered or used in any way, otherwise the system may not function correctly and the warranty may be void.

8.2 On the base system there are four rectifier AC inputs while on the expanded system there are eight, one for each rectifier. Each AC input is identified as follows: Module 1 is L1, LN1 & G1; module 2 is L2, LN2 & G2; module 3 is L3, LN3 & G3 and module 4 is L4, LN4 & G4. The same designations are used on both the top and bottom rectifier shelf.

When viewing from the front of the system module 1 is on the left and module 4 is on the right. When viewing from the rear of the system the AC input for module 1 is on the right and for module 4 is on the left.

The input wires should be sized to carry 20A minimum. The AC terminals have 8-32 screws.

INSTALLATION & OPERATING MANUAL

8.3 The battery terminals are to the far left of the main system shelf. These can be configured in the factory for connection of two battery strings or as high current load circuits designated 11 & 12 (see 8.5 & 8.6 below). The terminals are ¼ - 20 studs.

8.4 The load circuit feeds 1 to 10, at the centre of the main system shelf, are sourced through the corresponding pluggable circuit breakers identified as 1 to 10 on the front of the unit.

The circuit breakers have a maximum allowed rating of 60A each. The return (RTN) terminal for each load is directly above the load terminal on a common system load return bus. For -48V systems this bus is +VE with respect to the load terminals whereas for +24V and +12V systems it is -VE with respect to the load terminals.

Note: installing circuit breakers greater than 60A capacity in load positions 1 to 10 may result in a hazardous condition occurring and could void the warranty.

8.5 To the far left are positions 11 & 12 which are normally used for connection to one or two strings of system batteries rated to source up to 125A maximum each.

The return terminals are directly to the right of the BAT terminals.

The BAT terminals are protected by circuit breakers, rated at 100A or 125A as required, located in positions 11 & 12 on the front panel. When the Low Voltage Disconnect (LVD) option is installed these feed are automatically opened by an internal contactor when the battery voltage drops below acceptable limits set in the controller.

An “unprotected” battery feed is shown toward the left side of the rear panel. This provides a means to connect additional battery strings to the system for longer back-up times. Protection for these additional strings must be provided external to the system. This battery feed is also connected to the load bus through the LVD contactor and will open when the contactor is de-energised.

All battery connections are designed to allow use of standard ¼ - 20 2-hole lugs.

8.6 When the BAT1 and BAT2 terminals are used for additional high current load feeds these are sourced from the internal load bus via circuit breakers (ratings 60A, 80A or 100A) in positions 11 & 12 on the front panel.

In this case the “unprotected” battery feed is the only means for connecting external battery strings as described in 8.5 above.

8.7 To the far right of the main system shelf are two banks of spring clamp terminals for signal connections, designated J1 and J2. These signals are described in section 10.2.

All relay alarm outputs are isolated Form-C contacts that may be floated from GROUND by up to 100V. Maximum contact current and voltage are 1A and 30V (DC or AC) respectively. There are a total of four relay outputs with Normally Open (NO), Normally Closed (NC) and Common (COM) contacts available for connection.

The alarm relays are designated K1 to K4. K1 and K2 are pre-programmed for MAJOR and MINOR alarm conditions. K3 and K4 are not pre-programmed. The function of each alarm relay may be programmed as desired using the Alarm Configuration WEB page described in section 12.5 of this manual.

A temperature probes (supplied as standard) can be connected for Battery Temperature Compensation to pins 7 and 8 of J1. A second temperature (supplied as an additional accessory item) can be connected to pins 7 and 8 of J2 and may be used to measure any external temperature.

9.0 LED INDICATORS

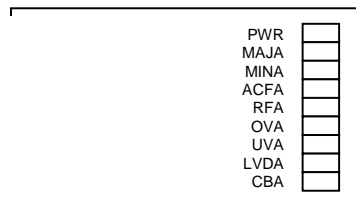


Figure 4 - LED Indicators (lower front far right)

During normal operation there will be one green LED displayed as shown in figure 4 above.

The LED indicators provide visual indication of both status and alarm conditions as described below:

- PWR** – **GREEN** – Indicates that the unit has power.
- MAJA** – **RED** – Indicates a ‘Major’ (Immediate Response) alarm condition.
- MINA** – **RED** – Indicates a ‘Minor’ (Scheduled response) alarm condition.
- ACFA** – **RED** – NOT USED.
- RFA** – **RED** – Indicates a rectifier module failure.
- OVA** – **RED** – Indicates that the system BUS voltage is too high.
- LVA** – **RED** – Indicates that the system BUS voltage is too low.
- OVA** – **RED** – Indicates that the system BUS voltage is too high.
- LVDA** – **RED** – Indicates that the LVD contactor is open.
- CBA** – **RED** – Indicates that that a circuit breaker is open.

10.0 MAKING CONNECTIONS TO THE X200

10.1 DC Load Connections

For each main load circuit there is one terminals marked 1 through 10 respectively for the DC 'feed' and one marked RTN for the DC 'return'.

Note that in the case of -48VDC system the 'feed' terminals are at a negative potential with respect to the 'return' terminals. In the case of +24VDC and +12VDC systems the 'feed' terminals are at a positive potential with respect to the 'return' terminals.

When connecting to the DC load terminals it is important to ensure that the cables used are adequately sized to carry the expected load current for the circuit in question.

10.2 Alarm Relay and Battery Temperature Probe Connections – J1 & J2

Connections to the Form-C alarm relay outputs are made through the two banks of way spring clamp terminal connectors. There are a total of 4 relay outputs with Normally Open, Normally Closed and Common Contacts available for connection. The individual relays contact sets are fully isolated and may be floated from GROUND by up to 100V. Maximum contact current and voltage are 1A and 30V (DC or AC) respectively.

The alarm relays are designated K1 to K4. K1 and K2 are pre-programmed for MAJOR and MINOR alarm conditions by default. K3 and K4 are not programmed for any alarm function.

The function of each alarm may be programmed using the **Alarm Configuration** WEB page described later in section 12.

Connection of the supplied battery temperature probe, if required, is made using terminals 7 and 8 of spring clamp terminal bank J1 and for the optional external temperature probe to terminals 7 and 8 of spring clamp terminal bank J2.

Terminals 9 and 10 of spring clamp terminal bank J1 form a contact closure input that can be used to sense an external event such as door alarm.

NOTE: Any sensor, such as a switch or relay, that is connected to the digital input MUST be galvanically isolated.

This connector is a Phoenix Contact part type MCO.5/4-G-2.5.

The optional external temperature probe is identical to the battery temperature probe that is supplied as standard, so there is no risk of mixing the two up on receipt.

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J1 CONNECTIONS	
1	K1 - MAJ ALARM – N/O
2	K1 - MAJ ALARM – COM
3	K1 - MAJ ALARM – N/C
4	K2 - MIN ALARM – N/O
5	K2 - MIN ALARM – COM
6	K2 - MIN ALARM – N/C
7	BATT. TEMP. PROBE +
8	BATT. TEMP. PROBE -
9	INPUT ALARM CONTACT -
10	INPUT ALARM CONTACT +

J2 CONNECTIONS	
1	K3 – FREE ALARM – N/O
2	K3 – FREE ALARM – COM
3	K3 – FREE ALARM – N/C
4	K4 – FREE ALARM – N/O
5	K4 – FREE ALARM – COM
6	K4 – FREE ALARM – N/C
7	EXT. TEMP. PROBE +
8	EXT. TEMP. PROBE -

Note that terminal 1 is to the left when viewed from the rear of the system.

Figure 5 –Temperature Probe & Alarm Relay Connector Pin-Out

10.3 Ethernet Connection – J3

The X200 is connected to a TCP/IP LAN (Local Area Network) or directly to a PC using connector J3. This is a standard RJ45 network connector allowing connection of any generally available Ethernet cable. Note that if the X200 is to be connected directly to a PC rather than a LAN then a cross-over Ethernet cable will be required.

J3 CONNECTIONS	
Pin	Function
1	TX +
2	TX -
3	RX +
4	Not Used
5	Not Used
6	RX -
7	Not Used
8	Not Used

Figure 6 - Ethernet Connector Pin-Out

11.0 INSTALLATION

The X200 can be mounted in 19" racks by using the supplied brackets. Mounting in 23" racks requires the use of rack mount extenders. Mount it from the front of the rack using the correct offsets to align with existing rack-mounted equipment. Once mounted in the rack the following connections must be made with the unit switched off.

CAUTION: Re-read the Safety Warnings and Precautions in Section 3. All power should be OFF for the input and output loads before making connections. Connection of the X200 chassis to frame ground should be made first. If the X200 has been turned on before installation connections, it should be turned off and given a 5-minute waiting period for all internal energy storage capacitors to be discharged.

11.1 Input AC Power Connection

3-wire AC power lines should be connected to each of the input terminal block but not plugged into the AC power source. The line, neutral and ground connections should be carefully observed when making the AC connections. The AC line cord should be sized to safely carry 25 amperes AC each, minimum.

11.2 Checking Outputs

Turn all output circuit breakers to the OFF position. With no loads connected and without the battery connected, plug in or connect the AC input cords one at a time to the AC power source. Be sure to use the correct AC voltage for the rectifier inputs. Using a volt meter measure the DC voltage reading across the -VO and +VO bus bars connecting the rectifier section to the lower section at the rear of the unit. The voltage should be approximately 54.4, 27.2, or 13.6VDC (depending on model), which is the factory setting. One by one, turn each output circuit breaker to the ON position and measure the DC voltage across the corresponding output terminals. The voltage should again read approximately 54.4, 27.2, or 13.6 volts. After each output is measured, turn OFF that circuit breaker and turn ON the next one. After measuring the last circuit, turn off that breaker and make sure that all output breakers are in the OFF position. Next, unplug or disconnect the AC input power source. Before touching any terminals wait 5 minutes for the internal storage capacitors to discharge.

11.3 Controller Section Operation and Settings

At this point, before the final installation connections, read section 12 covering Controller setup. Next, make any required signal connections, controller adjustments, temperature compensation adjustment and alarm enabling settings.

WARNING: Remember to take precautions each time the system is turned on and also when connecting or disconnecting the battery. Remember that the battery presents an energy hazard at its terminals. Also remember to allow 5 minutes for internal capacitors to discharge after disconnecting the AC input power and the battery.

11.4 Connection to Loads

With input AC power unplugged, the battery disconnected and no other power sources connected to the loads, make sure that all load circuit breakers are set to the OFF position. Connect load wires to each set of output terminals, one at a time. Note that the front panel breaker and fuse numbers directly correspond to the output terminal numbers. Be sure to connect the polarities correctly.

11.5 Connection to Battery

WARNING: Improper polarity of the battery connection may damage the power system. Take precautions when installing the battery and note that the battery cables are “hot” (live) and present an energy hazard.

With AC input unplugged, remove the three rectifier modules from the system chassis. Make sure all load circuit breakers are in the OFF position. Set the battery circuit breakers to the OFF position. Carefully connect the battery cables to the battery terminals shown in Figure 2 while observing the correct polarity.

Note that until AC power is applied to the system the controller will not activate the LVD contactor (when fitted).

11.6 System Turn-On

Perform the following operations:

1. Set the battery and all load circuit breakers to the OFF position.
2. Plug in the rectifier modules.
3. Connect the AC power cables to the AC source.
4. Check that the green LED on the front panel has lit. After approximately 20 seconds for initialization the MAJ LED at least will light.
5. Set the battery circuit breaker to the ON position. Then set the load breakers to the ON position.
After approximately 5 seconds the status of MAJ LEDs will change, dependent on the number of rectifiers installed.

Using the WEB browser interface described in section 12 it is now possible to check overall system status for correct operation.

In particular, it is important to ensure that the load current reading does not exceed the maximum capacity of the installed rectifiers or, where N+1 operation is required, the maximum capacity of one less than the total number of rectifiers installed. Note also, that the system should have been sized so that a proportion of the available rectifier capacity is allocated for battery charging. Where N+1 redundant operation is used the additional ‘spare’ rectifier will normally provide this current.

IMPORTANT NOTES:

- a) It is not possible to start the system by connecting the batteries alone.
- b) During the 30 seconds initialization period the system bus voltage will be at the factory preset level of the rectifiers. Nominally 54.4V, 27.2V or 13.6V depending on system voltage. After this period the internal controller will lower the output voltage by approximately 15% in order to limit current flowing to the batteries. During a following period of approximately 30 minutes the controller will ramp the system voltage up to the correct float voltage as determined by the temperature compensation algorithm.

12.0 USING THE CONTROLLER WEB BROWSER INTERFACE

The X200 is provided with a built-in WEB server which can be accessed through the TCP/IP Ethernet port using a WEB browser.

The WEB server employs Java Applets to continually scan system parameters and update the WEB page data. These same Applets return programming data to the X200 when set-up changes need to be made.

The WEB server communicates with the browser using HTTP on IP Port 80 and the Java Applets on IP Port 8888. If any firewall or proxies are configured on the LAN that the X200 is connected to it is important to ensure that these ports are open, otherwise the X200 will not respond.

Note also that a genuine Java engine must be installed on the browser PC. The latest version can be downloaded and installed for free from www.java.com.

The X200 has various network programming capabilities which allow it to be connected to almost any configuration of IP network.

The default network settings that the X200 is shipped with are:

IP Address	– 192.168.0.200
Subnet Mask	– 255.255.255.0
Gateway	– 0.0.0.0

All pages served by the X200 built-in WEB server consist of two frames; a ‘navigation’ frame on the left hand side and an ‘information/programming’ frame which occupies the majority of the browser window.

The buttons in the ‘navigation’ frame can be used at all times to jump between the various pages. Clicking on the UNIPOWER Telecom logo at the top will navigate directly to the UNIPOWER Telecom WEB site www.unipowertelecom.com.

Each of the blocks of information in the ‘information/programming’ frame is a Java applet. In some cases these applets simply collect information from the X200 and presents it on-screen, in other cases the applets contain data entry fields for uploading programming information to the unit.

Note that a PC screen resolution of 1024 x 768 or higher is recommended to avoid excessive amounts of page scrolling.

The following sections describe the various WEB pages that can be viewed with the browser and give details of programming parameters that may be entered and sent to the unit.

IMPORTANT NOTE: The screenshots shown throughout this section are ‘typical’ examples. The exact data content will differ dependent on the system voltage and whether alterations from the default settings have been made. Settings can be returned to the factory defaults at any time by clicking on the ‘DEFAULT’ then ‘UPLOAD’ buttons on the relevant setup page. This action requires the level 1 password.

12.1 Controller Status

When the X200 is first accessed using a WEB browser the *Controller Status* page shown below is downloaded.



Figure 8 - Controller Status WEB Page (typical)

This page presents two blocks of information. The top block displays a number of system status parameters by mimicking a block of LEDs.

The bottom block of information shows the following ‘live’ data:

- Bus Voltage
- Battery Current
- Rectifier Current
- Load Current
- Battery Temperature
- External Temperature
- Controller Temperature
- No. of Rectifiers Installed (includes all rectifiers that are present regardless of status)

If the battery or external temperature probes are not connected a reading of 25°C will be displayed by default.

12.2 Rectifier Status

The *Rectifier Status* page presents detailed information about an individual rectifier module. Two types of data are included; ‘live’ status information and ‘static’ inventory information. In addition the controller returns the I²C address as confirmation that the unit has responded.



Figure 9 - Rectifier Status WEB Page (typical)

In order to obtain status information about a particular rectifier module it is necessary first to dial in the required rectifier address according to the table below and then click on the SELECT button to confirm the request.

RECTIFIER I ² C ADDRESSING		
Rectifier Position	Bottom Row	Top Row
	Address	Address
Left	0	4
Centre Left	1	5
Centre Right	2	6
Right	3	7

Figure 10 - Rectifier I²C Addressing

A few seconds after the SELECT button has been pressed the X200 will respond and the status and inventory information will be updated as follows:

'Live' data is presented in the form of 8 coloured indicator blocks to the left. A green block indicates a 'good' condition and a red block indicates a 'bad' condition. In addition the unit's internal temperature is presented on the right.

Note that BLUEstreak Series rectifiers include two fans only and that one of the status indicator blocks will always be greyed out.

'Inventory' data, presented on the right below the temperature measurement includes, among other items, rectifier model number Serial Number and Revision Number.

12.2.1 Rectifier Inhibit (Shutdown)

The X200 includes a facility that enables the user to manually inhibit or shutdown individual rectifiers. This may be desirable when a particular rectifier is to be removed from the system for maintenance, although all UNIPOWER rectifiers are Hot-Swap, or for some other reason.

To inhibit a rectifier first dial in the I²C address of the required unit and the click on SHUTDOWN.

To restart a rectifier that has been inhibited dial in the I²C address of the required unit and the click on RUN.

Note that any rectifiers which have been inhibited will remain in this state until they are either restarted using the above method or the AC power is recycled.

12.3 Controller Factory Calibration

The primary purpose of the *Controller Factory Calibration* page is to allow UNIPOWER Telecom to setup a range of necessary calibration values to ensure correct operation.

When this page is requested and the Java applet has loaded a dialog requesting the Level 2 Passcode is presented. Once the passcode has been entered click ENTER and the page will then be updated with current values after a few seconds.

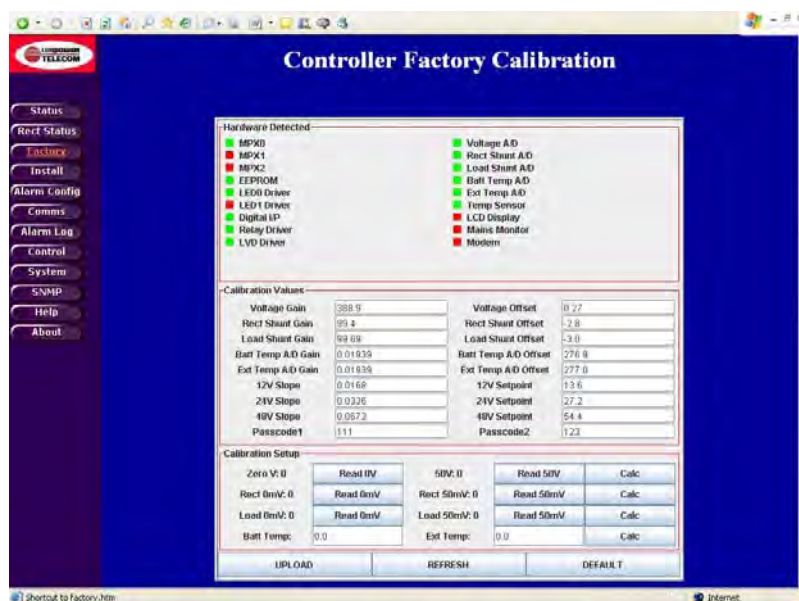


Figure 11 - Controller Factory Calibration WEB Page (typical)

NOTE: It should not normally be necessary for changes to be made to this page other than to change the passcodes if so desired.

The factory set passcodes are:

Passcode 1 – 111

Passcode 2 – 123

12.4 Controller Site Installation

The *Controller Site Installation* page provides the system integrator or installer facilities for setting up the main system parameters.

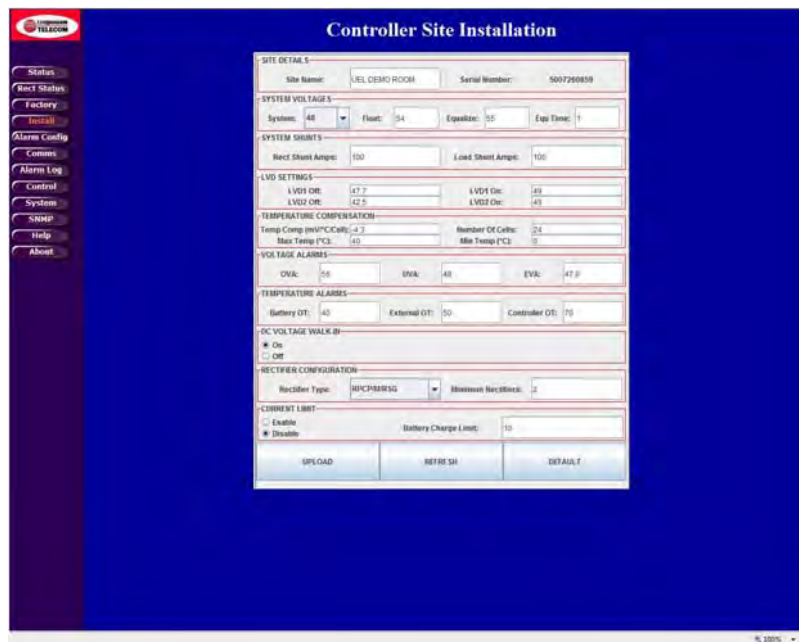


Figure 12 - Controller Site Installation WEB Page (typical)

To retrieve the currently programmed settings from the X200 click on REFRESH. After a few seconds the values will be displayed.

To reprogram to the factory default settings click on DEFAULT. After a few seconds the default values will be displayed.

To setup this page for a new configuration type in or select each new entry required and click on ENTER to confirm that entry. Once all required entries have been made click on UPLOAD. To confirm the new settings have been programmed into the X200 click on REFRESH. Check the entries after a few seconds to make sure they are still as required.

Each setting that can be made on this page is described below in detail:

SITE DETAILS

Site Name – Optional setting which may be used to identify the location of the unit.

Serial Number – Displays the unit serial number. (Cannot be changed.)

SYSTEM VOLTAGES

System – Dial in the Nominal system voltage; 12V, 24V or 48V.

Float – Enter the float voltage in accordance with the specifications of the batteries that are being employed with the system.

Equalize – Enter the equalization voltage in accordance with the specifications of the batteries that are being employed with the system.

Equ Time – Enter the desired time that the system should remain in equalize mode in accordance with the specifications of the batteries that are being employed with the system.

SYSTEM SHUNTS

Rect Shunt Amps – This is the 50mV Full-Scale rating for the internal shunt that is used to measure the total rectifier current. **THIS SETTING SHOULD NOT BE CHANGED.**

Load Shunt Amps – This is the 50mV Full-Scale rating for the shunt that is used to measure the total load current. **THIS SETTING SHOULD NOT BE CHANGED.**

LVD SETTINGS

LVD1 Off – Enter the voltage at which the LVD1 contactor will open during a battery discharge. The factory default setting is that recommended for most sealed lead acid batteries.

LVD1 On – Enter the voltage at which the LVD1 contactor will re-connect once the rectifiers are running. The factory default setting is that recommended for most sealed lead acid batteries.

LVD2 Off & LVD2 On – These settings are not required for the X200.

TEMPERATURE COMPENSATION

Temp Comp (mV/°C/Cell) – Enter the temperature compensation slope value in accordance with the specifications of the batteries that are being employed with the system.

Number Of Cells – Enter the total number of battery cells.

Max Temp (°C) – Enter the maximum temperature at which temperature compensation may be applied. Above this temperature the X200 will cease to apply further compensation to the float voltage.

Min Temp (°C) – Enter the minimum temperature at which temperature compensation may be applied. Below this temperature the X200 will cease to apply further compensation to the float voltage.

VOLTAGE ALARMS

OVA – Enter the voltage above which the Over-Voltage Alarm will be triggered.

UVA – Enter the voltage below which the Under-Voltage Alarm will be triggered.

EVA – Enter the voltage below which the End-Voltage Alarm will be triggered.

TEMPERATURE ALARMS

Battery OT – Enter the temperature at which the battery Over-Temperature alarm will be triggered.

External OT – Enter the temperature at which the external Over-Temperature alarm will be triggered.

Controller OT – Enter the temperature at which the controller's internal Over-Temperature alarm will be triggered. **THIS SETTING SHOULD NOT NORMALLY BE CHANGED.**

DC WALK-IN

ON (Default) – Causes the controller to slowly ramp up the DC rectifier voltage when AC is applied. The voltage will rise from approximately 45V (for 48V systems), 22V (for 24V systems) and 11V (for 12V systems) up to the float voltage. The ramp-up time is several minutes and cannot be adjusted. The purpose of this feature is to avoid initially large battery charging currents.

OFF – Causes the controller to program all rectifiers to the float voltage almost immediately after AC is applied. Battery charging current will only be limited by the current limit of the rectifiers.”

AC MONITOR

This facility is not available in the X200 and is not accessible.

RECTIFIER CONFIGURATION

Rectifier Type – This selects the type of rectifier installed in the system from the drop-down list. In the X200 this is factory preset to RPCM/P and **SHOULD NOT BE CHANGED.**

Minimum Rectifiers – Enter the minimum number of rectifiers that is required to provide sufficient current to the load and to simultaneously re-charge the batteries from a fully discharged state in the desired time according to the specification of the batteries being employed with the system.

CURRENT LIMIT

Select the appropriate button for ENABLE or DISABLE as required.

Battery Charge Limit – When enabled enter the maximum desired battery charge current.

Using this setting the X200 will intelligently control the rectifier float voltage such that the battery charge current never exceeds the set value.

12.5 Alarm Configuration

The *Alarm Configuration* page presents a matrix of tick boxes which are used to programme how certain system conditions affect the actions of the alarm relays and front panel LEDs. It is also used to define the ‘good’ condition (polarity) of the auxiliary digital input. The screen shot below shows the factory default settings.

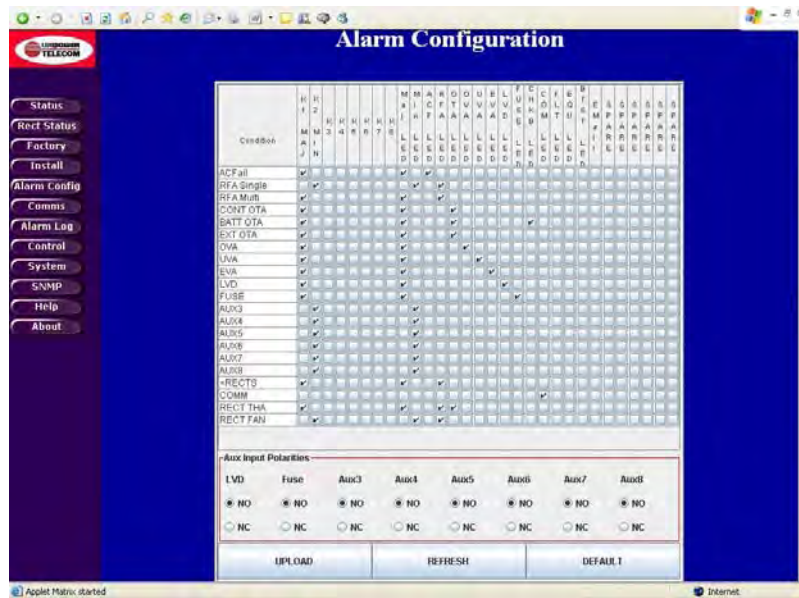


Figure 13 - Alarm Configuration WEB Page (typical)

12.5.1 Alarm Matrix Programming

K1 MAJ – An item ticked in this column will enable the MAJOR alarm relay when active. Any item that is considered to represent a condition which should be acted upon immediately should be ticked.

K2 MIN – An item checked in this column will enable the MINOR alarm relay when active. Any item that is considered to represent a condition that can wait for action at a later time should be ticked.

K3 & K4 – A ticked item in any of these columns will activate the relevant auxiliary alarm relay.

Note that **K5 – K8** are not installed in the X200 system.

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MAJ LED – An item ticked in this column will enable the MAJOR alarm LED when active.

MIN LED – An item ticked in this column will enable the MINOR alarm LED when active.

Note: The following LEDs are not fitted on the X200 but the function will show a valid condition on the controller status WEB page.

ACF LED – An item ticked in the column will activate the ACF LED when the condition occurs.

RFA LED – An item ticked in the column will activate the RFA LED when the condition occurs.

OTA LED – An item ticked in the column will activate the OTA LED when the condition occurs.

OVA LED – An item ticked in the column will activate the OVA LED when the condition occurs.

UVA LED – An item ticked in the column will activate the UVA LED when the condition occurs.

EVA LED – An item ticked in the column will activate the EVA LED when the condition occurs.

LVD LED – An item ticked in the column will activate the LVD LED when the condition occurs.

FUSE LED – An item ticked in the column will activate the FUSE LED when the condition occurs.

CHKB LED – An item ticked in the column will activate the CHKB LED when the condition occurs.

COM LED – An item ticked in the column will activate the COM LED when the condition occurs.

FLT LED – An item ticked in the column will activate the FLT LED when the condition occurs.

EQU LED – An item ticked in the column will activate the EQU LED when the condition occurs.

BTST LED – An item ticked in the column will activate the BTST LED when the condition occurs.

EMAIL – When the email reporting feature is activated ticking an item in this column results in an email message being sent immediately.

12.5.2 Aux. Input Polarities

By selecting the NO or NC radio buttons for the AUX 3 input the ‘good’ condition can be set to either Normally Open or Normally Closed respectively.

NOTE THAT THE LVD AND FUSE SETTINGS ARE PRESET AND SHOULD NOT BE CHANGED.

AUX 4 to AUX 8 are not fitted on the X200 system.

Once the required alarm and input polarity settings have been selected it is necessary to click on the UPLOAD button to store the new settings in the unit’s memory. To confirm that the new settings have been received and programmed click on the REFRESH button and wait a few seconds for the unit to respond. If no changes are apparent then the unit has been successfully reprogrammed.

To return the unit to the factory default settings click on the DEFAULT button.

12.6 Comms

Clicking on the **Comms** button loads to *Controller Network Settings* page. This page is used to setup the Ethernet and E-Mail communications settings.

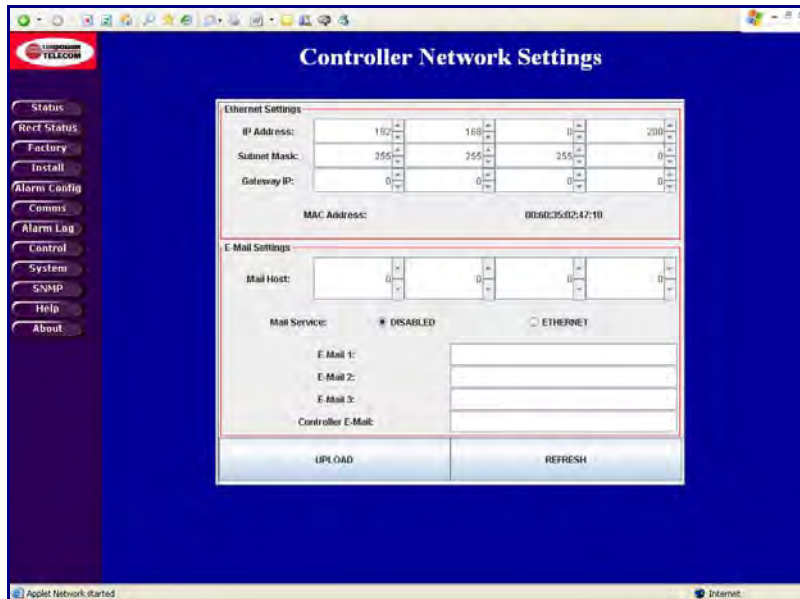


Figure 14 - Controller Network Settings (typical)

12.6.1 Ethernet Settings

12.6.1.1 IP Address

This setting defines the IP Address for the controller.

The default factory setting of 192.168.0.200 is a designated ‘private’ IP Address commonly used in IP based local area networks behind proxies, NAT routers or network bridges.

To enter a new IP address use the up/down arrows to dial in the required numbers or type them directly into the boxes as required. It is important to press the ENTER key on completion.

12.6.1.2 Subnet Mask

This setting defines the Subnet Mask associated with the above IP Address.

The default factory setting is 255.255.255.0.

To alter the Subnet mask use the up/down arrows to dial in the required numbers or type them directly into the boxes as required. It is important to press the ENTER key on completion.

12.6.1.3 Default Gateway

This setting defines the Network Gateway to which the controller will route all IP traffic that is destined for any location outside the LAN to which it is connected. This setting would normally be the address for the Proxy, NAT Router or Bridge that routes network traffic to the Internet or other WAN segments.

The default factory setting is 0.0.0.0, i.e. all traffic is retained within the LAN environment.

To alter the Default Gateway use the up/down arrows to dial in the required numbers or type them directly into the boxes as required. It is important to press the ENTER key on completion.

12.6.2 E-Mail Settings

12.6.2.1 Mail Host

This setting is the IP Address of the E-Mail Server that will route SMTP messages sent by the controller.

To set this address use the up/down arrows to dial in the required numbers or type them directly into the boxes as required. It is important to press the ENTER key on completion.

12.6.2.2 Mail Service

Select the ETHERNET radio button to switch on the E-Mail alarm facility, select the DISABLE radio button to switch it off.

12.6.2.3 E-Mail 1, 2 & 3

The X200 is able to send alarm messages to up to three unique email addresses.

Type in the desired address in the E-Mail 1 box using the normal name@domain format and press the ENTER key to confirm.

Repeat as required for E-Mail 2 and E-Mail 3.

12.6.2.4 Controller E-Mail

The X200 requires an email address of its own to send email alarm messages. Note, however, that it is unable to receive messages sent to this address.

Type in the desired address in the Controller E-Mail box using the normal name@domain format and press the ENTER key to confirm.

Once all desired Ethernet and E-Mail settings have been entered click on the UPLOAD button to programme them into the controller. To confirm successful programming on these setting click on the REFRESH button, wait a few seconds for the unit to respond and then ensure that the desired settings are returned by the unit.

CAUTION: Once a new IP Address has been uploaded it will be necessary to redirect the browser to this new address in order to access the WEB pages.

12.7 Alarm Log

The *Alarm Log* page can be used to view a history of alarm and other conditions that have occurred.

When this page is first loaded the alarm log window will be empty.

To load the current log file click on REFRESH. After a few seconds the log data will be loaded.

To clear the log click on the CLEAR button, then refresh the page click on the REFRESH button.



Figure 15 - Controller Alarm Log WEB Page (typical)

12.8 Control

The *Controller Control Panel* page is used to remotely switch the system between FLOAT and EQUALIZE modes. This page displays various system status functions enabling the operator to monitor these system parameters from a remote location.

To set the system to equalize mode click on the EQUALIZE button. After a few seconds the unit will respond by switching off the FLT LED indicator and switching on the EQU LED indicator.

To return the system to float mode, click on the FLOAT button. The unit will respond by returning the FLT and EQU LED indicators to their normal state.

Note that if the unit is not returned to float mode manually it will be returned automatically after the pre-programmed time has elapsed.



Figure 16 - Controller Control Panel WEB Page (typical)

12.9 System

The Controller System Settings page enables a user to alter the controller's real-time clock date and time settings. New date and time settings can be entered manually or automatically synchronised with a 'host' system.



Figure 17 - Controller System Settings WEB Page (typical)

12.9.1 Manual Setting

To enter a new date and/or time manually either use the up/down buttons to dial in the desired settings or type them directly into the required boxes. Press the ENTER key in each case to confirm.

Once the desired settings have been enter click on the SET button to upload them.

12.9.2 Automatic Setting

To synchronise the date and time with the computer being used to access the controller click on the SYNC button to load the new settings from the computer and then click on the SET button to upload them.

To update this page with the controller's current date and time click on the GET button.

12.10 SNMP (Option)

The SNMP Configuration page is used to setup the controller’s SNMP System Information, Alarm Trap and Agent Information parameters. It also allows the SNMP feature to be activated.

When the SNMP option has not been purchased it is not possible to enter any parameters on this page.

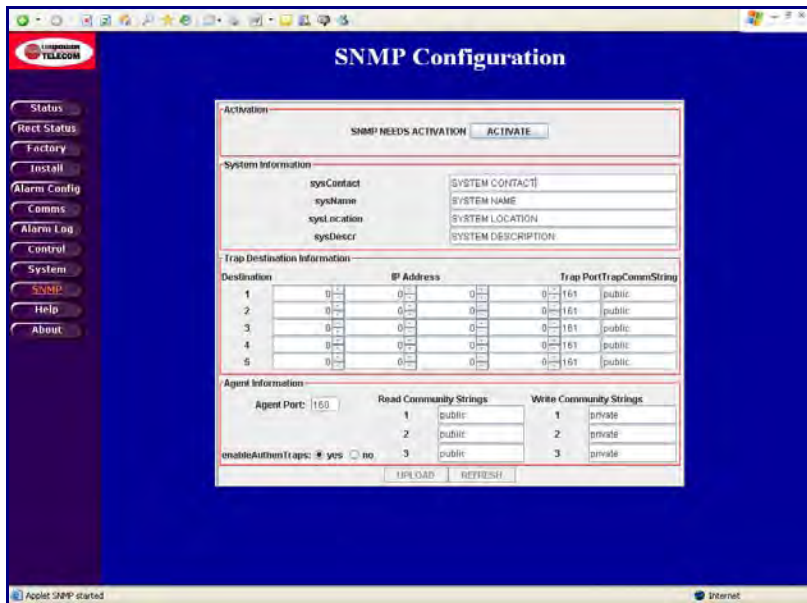


Figure 18 - SNMP Configuration WEB Page (typical)

Note: It is assumed that customers wishing to employ the SNMP features of the X200 will be familiar with the necessary set-up procedure for this page.

As with all other WEB pages described in this manual it is necessary to click on UPLOAD to programme the desired settings and to click on REFRESH to review them.

Clicking on ACTIVATE will have no effect unless the SNMP feature has been purchased and installed in the unit.

The X200 MIB, detailed in Appendix 3 of this manual is available for download from the UNIPower Telecom WEB site:

http://www.unipower-corp.com/About_Unipower_Corporation/Customr_Service/Operating_Manuals/operating_manuals.html

12.11 Help

The Controller Help Page provides a few quick reminder notes. For more detailed help the user is referred to this manual.

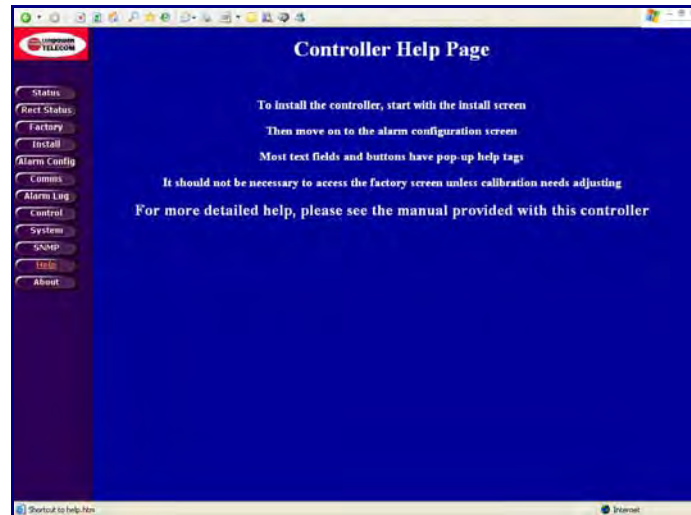


Figure 4 - Controller Help WEB Page (typical)

12.12 About

The About UNIPOWER Telecom page provides contact information in case additional technical or other support is required.

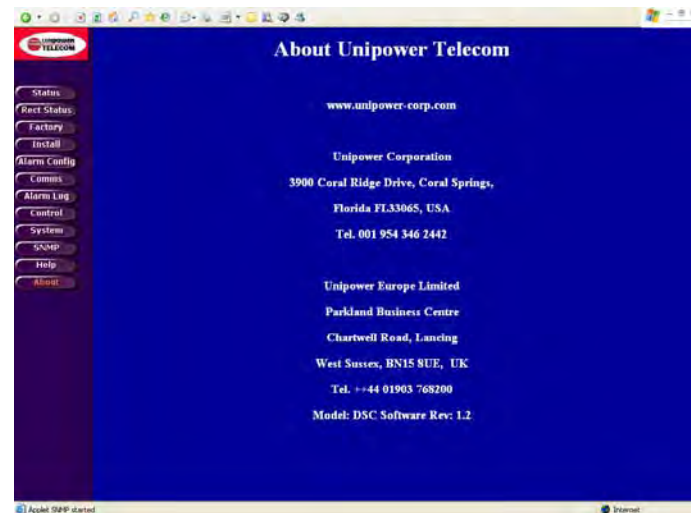


Figure 5 - About UNIPOWER Telecom WEB Page (typical)

Appendix 1 – SNMP MIB Information.

The SNMP feature provides status read-out and alarm trapping only. All parameters described in this appendix are therefore read-only.

Refer to the appropriate sections earlier in the main body of this manual for system set-up.

Parameters for UNIPOWER X200 Remote Access Controller MIB

1. Voltages

Bus Voltage - Description: Live data giving actual voltage of system bus.

2. Currents

Battery Current - Live data giving actual current drawn from or into battery string(s).

Rectifier Current - Live data giving actual current drawn from rectifier power supply system.

Load Current - Live data giving actual current delivered to the load.

3. Temperatures

Battery Temperature - Live data giving actual temperature of battery string.

External Temperature - Live data giving actual temperature of external sensor.

Controller Temperature - Live data giving actual temperature within the controller enclosure.

4. Rectifier Info

Number of Rectifiers - Live data giving number of rectifiers detected by the controller.

5. Auxiliary Inputs

These are all part of one status flag held within the controller.

- Digital Input 1 (Low Voltage Disconnect State)
- Digital Input 2 (Fuse/Breaker State)
- Digital Input 3
- Digital Input 4
- Digital Input 5
- Digital Input 6
- Digital Input 7
- Digital Input 8

6. Alarms

These are all part of one alarm status flag held within the controller.

ACFAIL - Indicates an AC Failure detected by the power supply rectifiers or an external sensor.

MAJOR - Indicates that a major alarm condition requiring immediate attention has been detected by the controller.

MINOR - Indicates that a minor alarm condition requiring attention at the next scheduled maintenance has been detected by the controller.

SINGLE RECTIFIER FAILURE (SRFA) - The controller has detected that a single rectifier has failed

MULTI RECTIFIER FAILURE (MRFA) - The controller has detected that multiple rectifiers have failed.

OVER TEMPERATURE ALARM (OTA) - The controller has detected an over temperature condition on battery/external/controller temperature sensor.

OVER VOLTAGE ALARM (OVA) - The controller has detected an over voltage condition on the bus.

UNDER VOLTAGE ALARM (UVA) - The controller has detected an under voltage condition on the bus.

END VOLTAGE ALARM (EVA) - The controller has detected an End Voltage condition, i.e. the batteries are near end of discharge.

LOW VOLTAGE DISCONNECT ALARM (LVD) - The controller has detected that one of the LVDs is open.

FUSE ALARM - The controller has detected that a fuse or breaker is open.

CHECK BATTERY (CHKBAT) - The controller has detected a fault with the battery string(s) either temperature or current related.

COMMUNICATION FAULT (COMM) - The controller has detected a problem with the internal I²C bus.

7. Settings

OVER VOLTAGE ALARM SETTING - Setting for over voltage alarm.

UNDER VOLTAGE ALARM SETTING - Setting for under voltage alarm.

END VOLTAGE ALARM SETTING - Setting for end voltage alarm.

LVD1OFF SETTING - Setting for voltage at the point where LVD1 will be shut off.

LVD1ON SETTING - Setting for voltage at the point where LVD1 will be turned on.

LVD2OFF SETTING - Setting for voltage at the point where LVD2 will be shut off.

LVD2ON SETTING - Setting for voltage at the point where LVD2 will be turned on.

FLOAT VOLTAGE - Voltage setting for the bus in float mode (modified by temp. compensation).

EQUALIZE VOLTAGE - Voltage setting for the bus in equalization mode.

NOMINAL SYSTEM VOLTAGE - The nominal system voltage (12, 24 or 48).

CONTROLLER OVER TEMPERATURE ALARM - The controller temperature, in degrees Celsius, above which an over temperature alarm will activate.

BATTERY OVER TEMPERATURE ALARM - The battery temperature, in degrees Celsius, above which an over temperature alarm will activate.

EXTERNAL OVER TEMPERATURE ALARM - The external temperature, in degrees Celsius, above which an over temperature alarm will activate.

TEMPERATURE COMPENSATION SLOPE - The parameter applied, in millivolts/°C/cell, to the float voltage to achieve temperature compensation.

TEMPERATURE COMPENSATION MAX TEMPERATURE - The temperature above which no further temperature compensation will be applied.

TEMPERATURE COMPENSATION MIN TEMPERATURE - The temperature below which no further temperature compensation will be applied.

8. Identification

SITE NAME - Holds the name of the site/system.

SERIAL NUMBER - Holds the serial number of the site/system.

9. SNMP Traps

The X200 will issue a trap if any of the alarm conditions mentioned above are activated.

A trap will also be issued when an alarm condition is cleared.

To obtain a copy of the latest X200 MIB download it from:

<http://unipowerco.com/operating-manuals>

or contact one of our sales offices.

Appendix 2 - REVISION HISTORY

Rev. #	Date	Detail	Page
1	11/2011	WEB release	
2	01/2012	Section 9 – replace 3 LEDs with 9 LEDs	12