



ACBU011 / ACLU011

REDUNDANCY CONTROLLER

USER MANUAL





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Redundancy Controller

I. Specifications

Redundancy		
Input Power	12-55 V	
Maximum Load Current	5 A	
Power Consumption	10 W	
Load Current Analyzer	Yes	
Dimensions	214mm x 188mm x 56.5mm	
Weight	2.6 kg	
Operating Temperature	-40°C to + 70°C	
Storage Temperature Range	-40°C to + 80°C	
Input Interface	N-Type or F-type	
Internal Reference	Yes (Autodetect)	
Certain Internal Reference stability	$\pm 3 \cdot 10^{-8}$	
Internal Reference Phase Noise	1 Hz	<-85 dBC/Hz
	10 Hz	<-115 dBC/Hz
	100 Hz	<-140 dBC/Hz
	1000 Hz	<-150 dBC/Hz
	10000 Hz	<-150 dBC/Hz
Internal Reference Frequency	10 MHz	
Communication Interface	RS232 and RS485	
BUC M&C Interface	BUC A and B – splitter: RS-232 or RS-485 4-wire	
Alarm Analyzer	Yes	
Waveguide switch type	WR-137/WR-229 WR-75 WR-28 WR-112	
Switch time	Fault detection, 20-50 msec Total switchover, 100 msec max	

II. Block Overview

The appearance of the Redundancy Controller and it's connectors are displayed on figure 1.1.

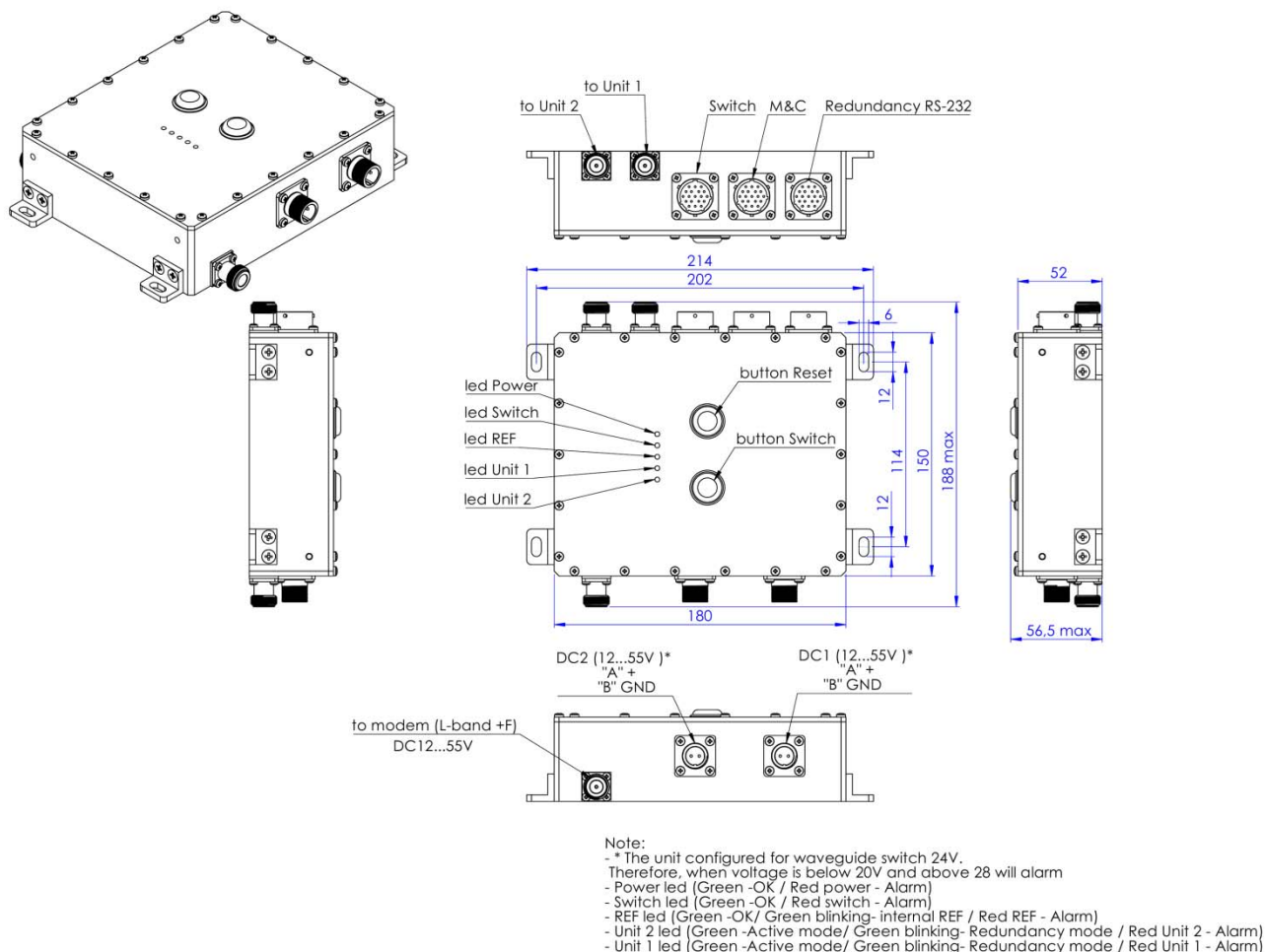


Figure 1.1 — Redundancy

Redundancy connection ports from one side:

- Two L-band F (or N) connectors for BUC connection provided via coaxial cable;
- Switch connector for connection Redundancy Controller with Switch with 19-pin cable on both sides;
- Redundancy Controller to laptop/PC connection provided via 19-pin cable from the Redundancy side and RS 232 (and/or RS 485) from the PC side;
- Redundancy M&C to Unit 1 and Unit 2 connection provided via 19-pin cable on Redundancy side and two 19-pin on the other side.

And from the other side:

- L-band F (or N) connector for BUC connection with modem provided via coaxial cable. It also can provide power supply from modem and external reference frequency.
- Two power ports (DC1 and DC2) connectors provided via 2-pin connectors.

III. 19 pin connector for a PC / Laptop

Redundancy Controller connection to PC carried by cable with 19 pin female connector (fig.1) on the one side and RJ45 (fig. 2), two DB9 (fig. 3) female connectors: RS232 and RS485 on the other side.

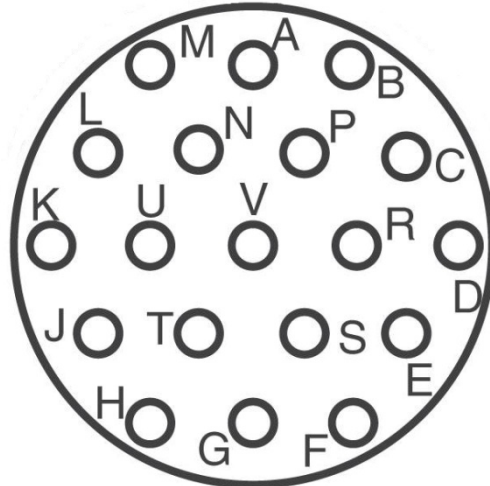


Figure 2.1 — 19 pin connector configuration

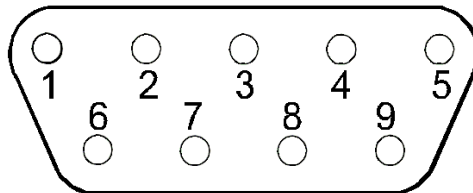


Figure 2.2 — DB9 connector configuration

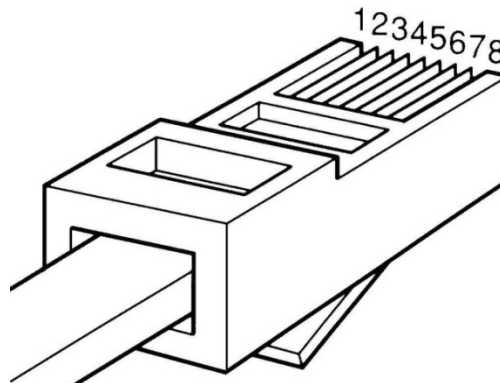


Figure 2.3 — RJ45 connector configuration

Interface name	Interface pin	Pin Name	19-pin Connector
RJ45	3	RX+	C
	6	RX-	P
	1	TX+	L
	2	TX-	N
		R75_TX	NC

		R75_RX	NC
		GNDISO	A
		GNDISO	
RS485	2	A	S
	1	B	F
	4	Z	H
	3	Y	T
	5	GNDISO	V
		GNDISO	
		NC	NC
		NC	NC
		GNDISO	G
RS232	5	GNDISO	
	2	RS232TX	J
	3	RS232RX	E

Figure 2.4 — Redundancy 19 pin connector for a PC/Laptop

19-pin Connector	Pin Name	20-pin (Unit 2)	20-pin (Unit 1)	Ethernet
M	MUTE1	17	NC	
B	ALARM1	18	NC	
E	RS232_TX1	11	NC	
J	RS232_RX1	16	NC	
G	GNDISO	12	NC	
		20	NC	
V	GNDISO	NC	12	
		NC	20	
T	RS232_TX2	NC	11	
S	RS232_RX2	NC	16	
H	MUTE2	NC	17	
K	ALARM2	NC	18	
	RX_P	2	2	3
	RX_N	6	6	6
	TX_P	7	7	1
	TX_N	8	8	2

Figure 2.4 — Redundancy 19-pin cable to Unit 1 and Unit 2

IV. Connector for a Waveguide Switch

Redundancy Controller connection to waveguide switch carried by cable with 19 pin female connector (fig. 2.1) on the both sides. Waveguide Switch schema on figure 2.1:

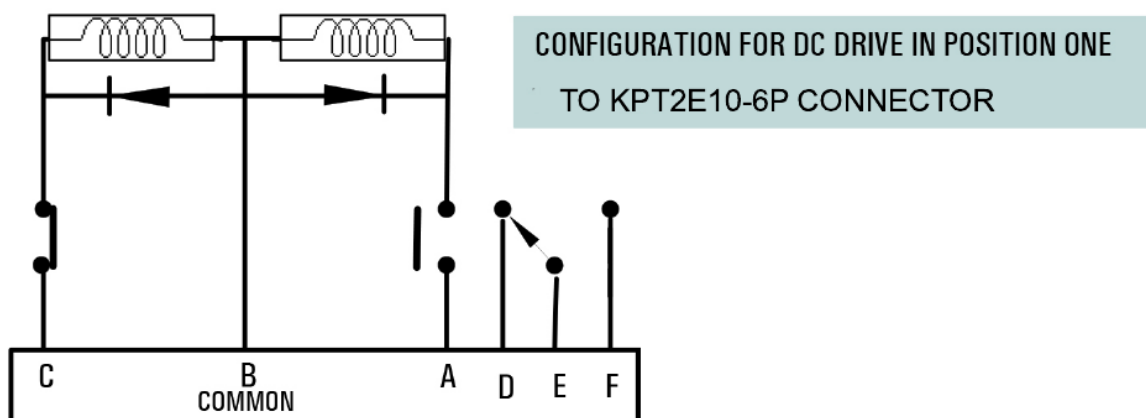


Figure 3.1 — Switch input pins



From Redundancy Interface pin	From Switch pin
A	A
B	B
C	C
D	D
E	E
F	F
G	G
H	H
J	J
K	K
L	L
M	M
N	N
P	P
R	R
S	S
T	T
U	U
V	V

Figure 3.2 — Switch interface

V. Redundancy Terminal User Manual

Run *Redundancy Terminal v 1.1* on your PC, when it opened you will see next window:

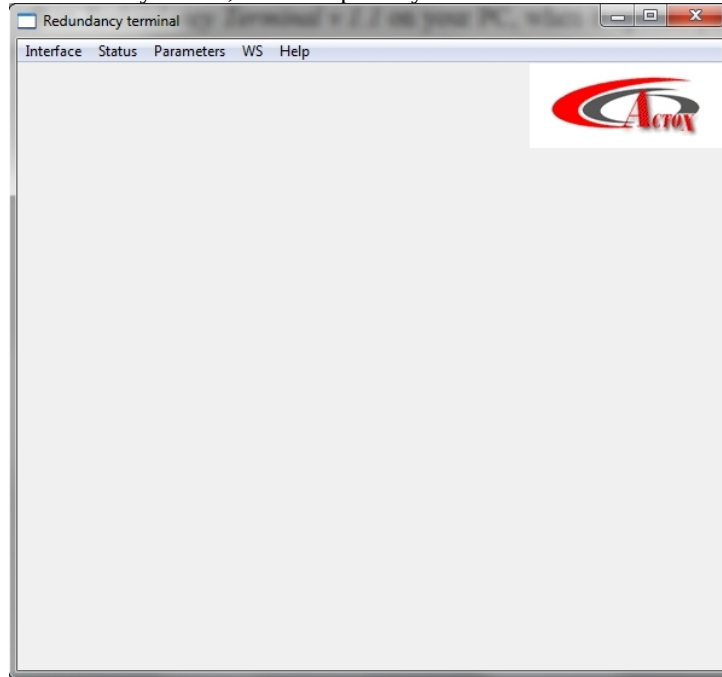


Figure 4.1 — Start window

On the top of the window situated menu tabs.

Interface – consist information about redundancy connection;

- **Serial port:** select COM port you want to connect to;
- **Exit:** select to quit program;

Status – push button **Read** to get current information about redundancy connector status. You will see next window:

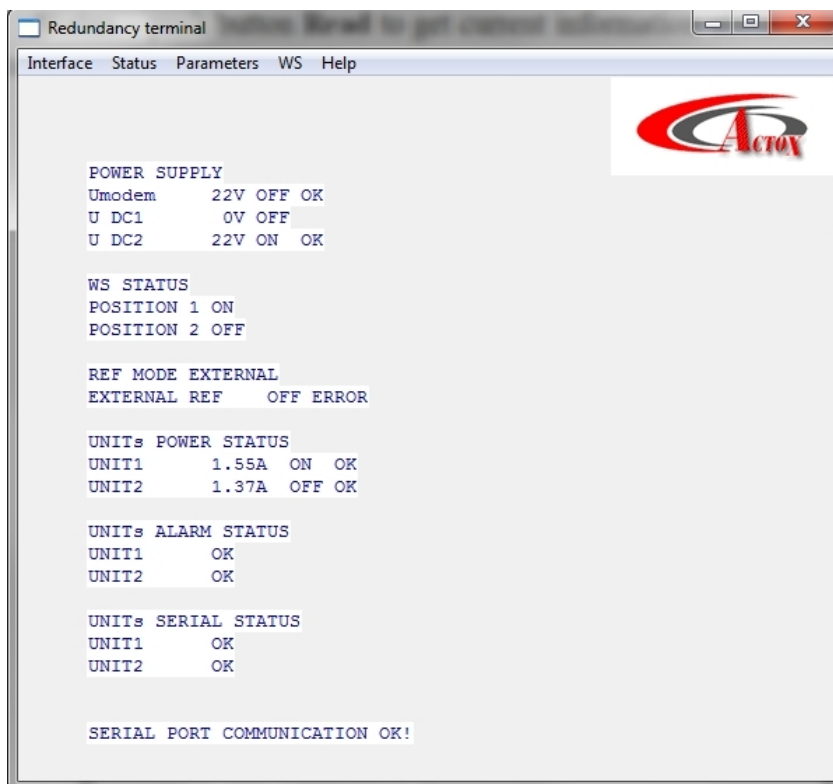


Figure 4.2 — Redundancy Status Window

- **POWER SUPPLY:** Redundancy power supply provides by two ways: by DC power supply (U DC1 and U DC2) and by RF connector from modem (Umodem). Function displays current income voltage and power port connection. Voltage is in OK if it's value within acceptable limits and ERROR if voltage out of limits. To set voltage limits go to menu tab Parameters.
- **WS STATUS:** displays current position of waveguide switch (fig 3.3).

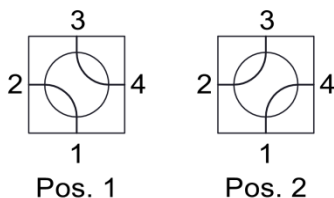


Figure 3.3 — WS RF paths positions

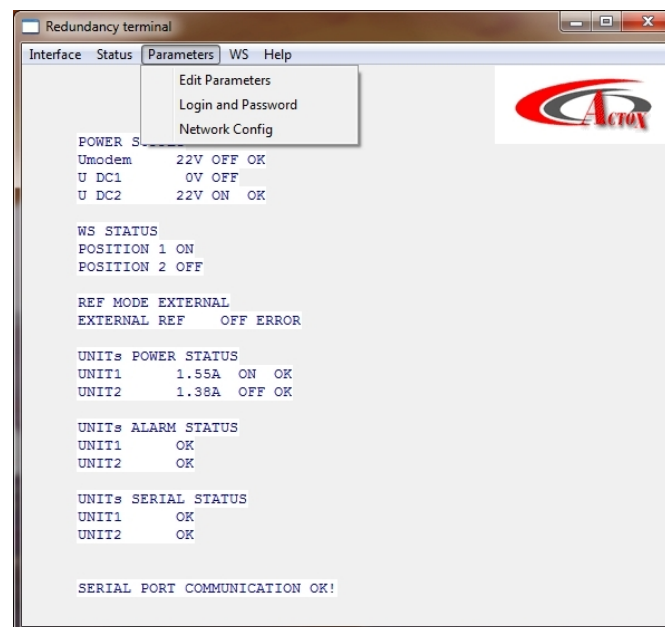
- Current position status will be **OK**, other will be **ERROR**;
- **REF MODE INTERNAL:** displays status of reference frequency mode; OK if Internal mode, ERROR if External mode.
- **POWER STATUS:** displays power or amperage appliance of **BUC**. Power or Amperage is in OK if it's value within acceptable limits and **ERROR** if out of limits. Device turn's off BUC if power or amperage parameters are out of limits. To set limits go to menu tab **Parameters**.

NOTE

Power is calculated by multiplying the current to voltage

- **ALARM STATUS:** displays summary failure of BUC. **ALARM STATUS** is an analog signal, transmitted via M&C cable. **OK** if alarmed, **DISABLE** if unalarmed.
- **SERIAL STATUS:** displays port connection status. **SERIAL STATUS** is a digital signal, transmitted via M&C cable. **OK** if correct port connected, **ERROR** if port failure and **DISABLED** if port don't connected.
- **SERIAL PORT COMMUNICATION:** displays Redundancy communication with PC status.

To change Redundancy controller system settings push button **Parameters**. You will see next window:



a. — Redundancy Parameters submenu

Edit Parameters — Edit your Redundancy parameters to send them in file or in device.

Push button **Edit** in submenu **Parameters** to open Configuration window (fig. 4.5 and fig 4.6).

Parameters Edit window for BUC configuration. The window contains the following fields and controls:

- Minimum Voltage:** 22
- Maximum Voltage:** 50
- Minimum Power:** 8
- Maximum Power:** 100
- WS Motor Voltage:** 24
- REF Mode:** ☒ External, ☐ Autodetect
- Watt/Ampere:** ☒ Watt, ☐ Ampere
- Redundancy:** ☒ Hot, ☐ Cold
- Current Sensors Offset:** UNIT1: 0.371, UNIT2: 0.371
- Power Supply Priority:** U MOD: 1, U DC1: 2, U DC2: 0
- Serial Interfaces:**
 - UNIT1: Port Enable ☐, Parity: Not, Stop bits: 1, Bit rate: 19200
 - UNIT2: Port Enable ☒, Parity: Not, Stop bits: 1, Bit rate: 19200
- UNIT Alarm:** UNIT1: ☒ Enable, UNIT2: ☒ Enable
- UNIT Power:** UNIT1: ☒ Enable, UNIT2: ☒ Enable
- File:** parameters.dat
- Buttons:** Read from file, Read from device, Save to file, Send to device, ESC

Figure 4.5 — Default configurations for BUC

Parameters Edit window for LNB configuration. The window contains the following fields and controls:

- Minimum Voltage:** 12
- Maximum Voltage:** 60
- Minimum Power:** 0.05
- Maximum Power:** 2.10
- WS Motor Voltage:** 24
- REF Mode:** ☒ External, ☐ Autodetect
- Watt/Ampere:** ☐ Watt, ☒ Ampere
- Redundancy:** ☒ Hot, ☐ Cold
- Current Sensors Offset:** UNIT1: 0.371, UNIT2: 0.371
- Power Supply Priority:** U MOD: 1, U DC1: 2, U DC2: 0
- Serial Interfaces:**
 - UNIT1: Port Enable ☒, Parity: Not, Stop bits: 1, Bit rate: 19200
 - UNIT2: Port Enable ☒, Parity: Not, Stop bits: 1, Bit rate: 19200
- UNIT Alarm:** UNIT1: ☒ Enable, UNIT2: ☒ Enable
- UNIT Power:** UNIT1: ☒ Enable, UNIT2: ☒ Enable
- File:** parameters.dat
- Buttons:** Read from file, Read from device, Save to file, Send to device, ESC

Figure 4.6 Default configurations for LNB

Supply parameters — set here minimum/maximum parameters for voltage, power or amperage supply and waveguide switch motor voltage value:

Minimum voltage – set here minimum value for Redundancy supply. This value:

- can't be lower than **WS Motor Voltage** value for proper Switch work
- can't be lower than minimum permissible working voltage for BUC or LNB.
- Minimum voltage value can't be lower than 12V;

Maximum voltage – set here maximum value for redundancy controller supply. This value:

- can be higher than power supply **WS Motor Voltage** (In that case value will be lowered to needed automatically)
- can't be higher than maximum permissible working voltage for BUC or LNB.
- Maximum voltage value can't be higher than 55V;

Minimum Power/Ampere – set here minimum Power or Current (depend from the flag in **Watt/Ampere** field (see fig. 4.5)) for each BUC or LNB and must be lower than minimum power (current) value for BUC or LNB, but can't be lower than 0.02 A;

Maximum Power/Ampere — set here maximum Power or Current for each BUC and LNB and must be higher than maximum power (current) value for BUC or LNB, but can't be higher than 5 A;

WS Motor Voltage — set here nominal voltage value that written in specifications for your switch device.

REF Mode — chose between Autodetect and External reference frequency.

Watt/Ampere — chose what parameter will be shown in the Minimum/Maximum Power cells.

Redundancy (in development) — chose operation mode for your Redundancy System. Power can be supplied for both BUC's (**Hot**) or only for the active one (**Cold**).

Power Supply Priority — set priority of device power supply. **Power Supply Priority** function searching available power supply and use it in the case that supply parameters are in setting limits. If supply parameters correct, device feeds in accordance to the established priority.

“0” — the highest priority

“2” — the lowest priority

Serial Interface — set parameters of Redundancy connection with BUC via M&C interface. Choose port you want to enable and set it parity, speed and bit rare (Bit rate speed depends on BUC version).

Alarm Enable — enable or disable summary BUC alarm via M&C cable.

Power Enable — enable or disable power supply alarm for BUC or LNB.

File Name — set name of the file to save configuration parameters. By default file's name *bucparameters.dat*;

Send to file — setted configuration will be saved only in created configuration file (by default *bucparameters.dat*).

Read from File — all parameters are included in special file you create. This option is useful when you have many configuration profiles so you can switch profiles without lost any of them. Created file will contain in a program folder. By default file's name *bucparameters.dat*;

Read from Device — all parameters are loaded in your Redundancy device;

Send to device — setted configuration will be uploaded in your device.

ESC — push button to return to the Redundancy Status Window.

Push button **Login and Password** (fig. 4.7) to change login settings

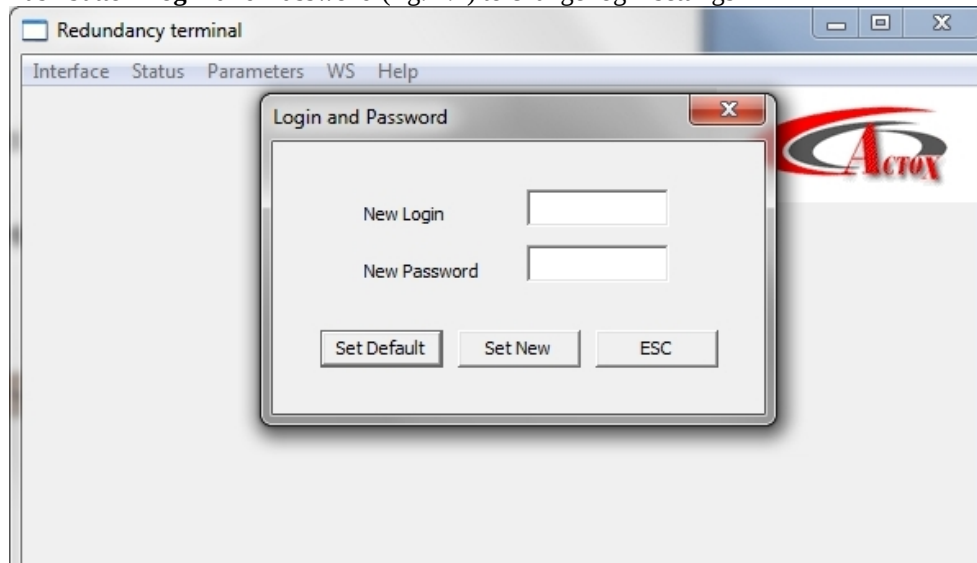


Figure 4.7 — Login and Password settings window

You can type in new login and password in appropriate cells and push button **Set New** to send this configurations to the device or push button **Set Default** to restore default login (123456) and password (123456).

Push button Net Configurations to open web parameters (fig. 4.8)

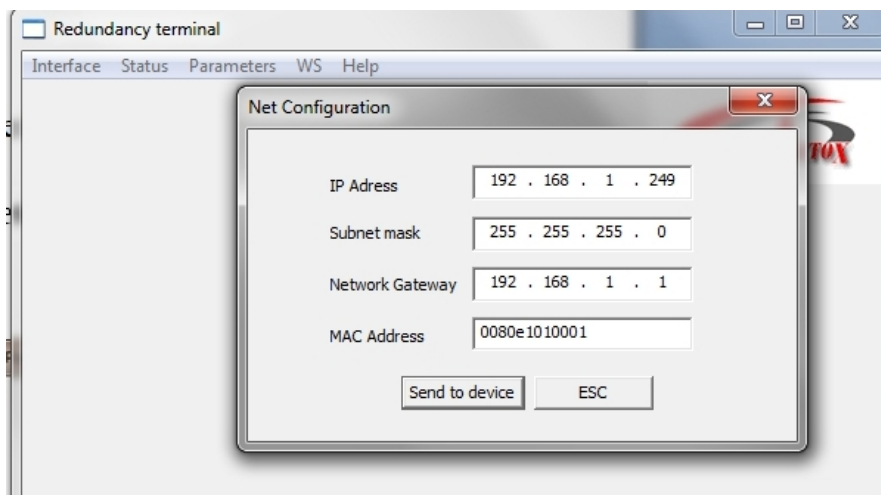


Figure 4.8 — Net Configuration window

Set manually parameters you want to change and push button **Send to device**.

In the latest version of the software you can change waveguide position. Open inset WS on the menu push button **Set Position**. You will see next window:

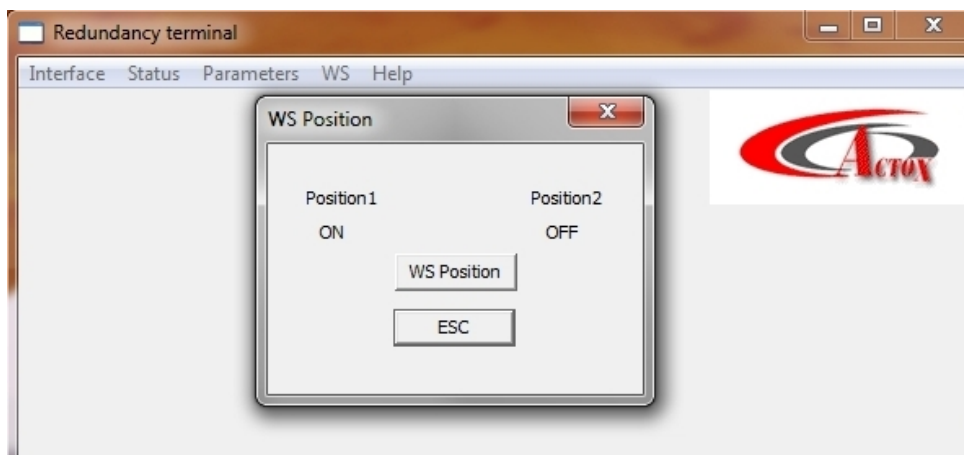
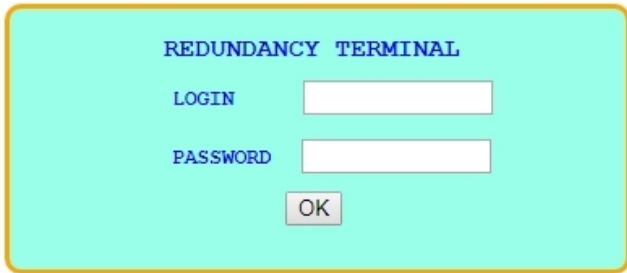


Figure 4.9 — WS Position window

Push button WS Position in the window to change waveguide position.

VI. Web interface user manual

Web interface provided with 19 pin connector for a PC/Laptop (see fig. 2.4)
Connect Redundancy controller with your PC/Laptop via Ethernet, switch on the device and open internet browser.
In the address line type in IP address of your Redundancy (by default IP address: 192.168.1.249) and you will see log-in window (fig. 6.1):

REDUNDANCY TERMINAL

LOGIN

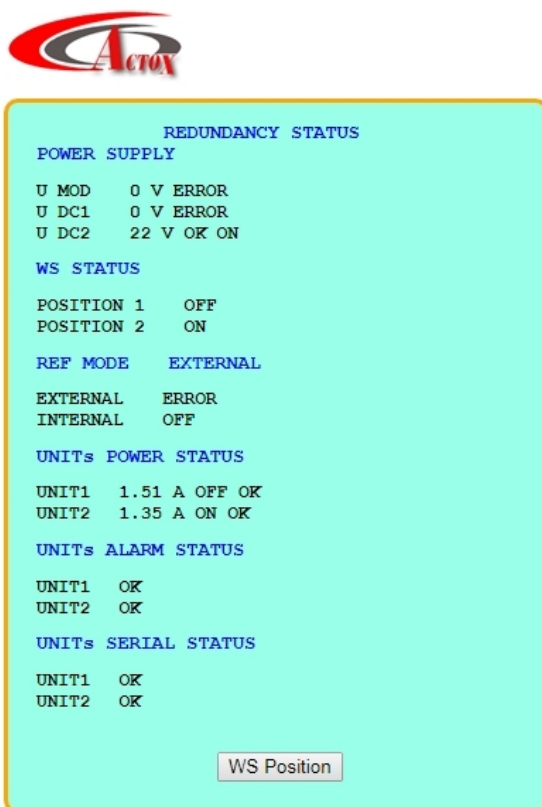
PASSWORD

OK

Actox Corporation

Figure 6.1 — Log in page

Type in login (by default 123456) and password (by default 123456) to log in and see **Redundancy Status** (fig. 6.2):



Redundancy Parameters

Figure 6.2 — Redundancy Status page

- **POWER SUPPLY:** Redundancy power supply provides by two ways: by DC power supply (U DC1 and U DC2) and by RF connector from modem (Umodem). Function displays current income voltage and power port connection. Voltage is in OK if it's value within acceptable limits and ERROR if voltage out of limits or supply not connected. To set voltage limits go to menu tab Parameters.
- **WS STATUS:** displays current position of waveguide switch (fig 6.3).

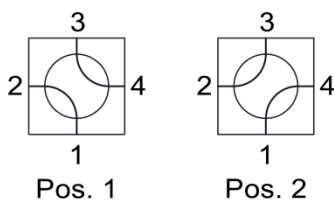


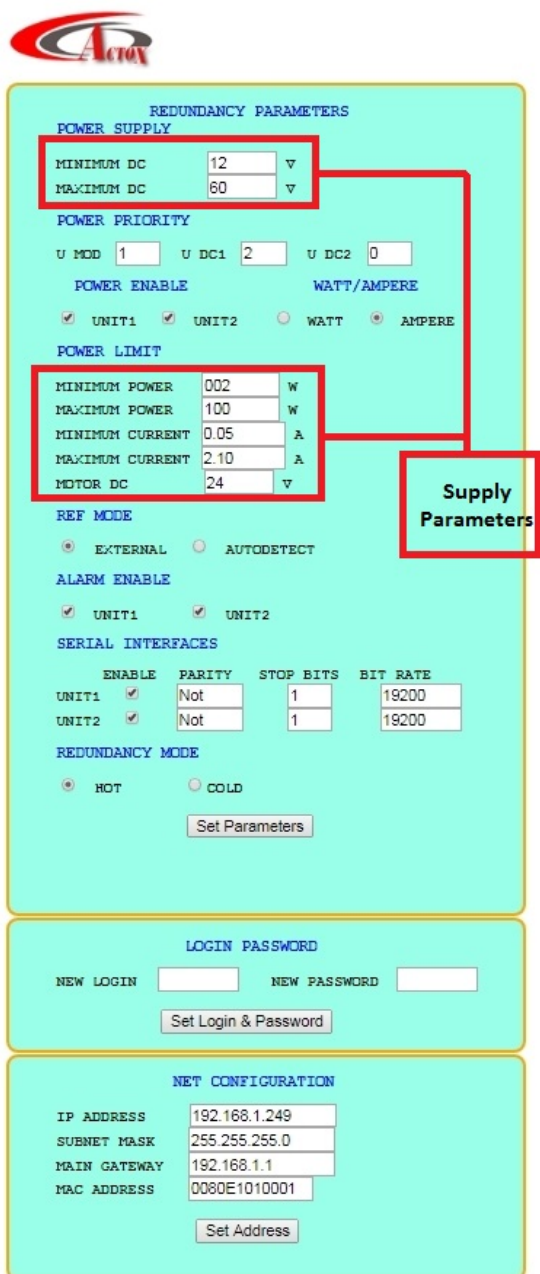
Figure 6.3 — WS RF paths positions

- Current position status will be **OK**, other will be **ERROR**;
- Push button **WS Position** to change position on your switch;
 - **REF MODE EXTERNAL:** displays status of reference frequency mode; OK if External mode, ERROR if no reference frequency. Internal frequency turn off in

this mode; You can switch this parameter on the Autodetect mode if your Redundancy has it's own Internal reference frequency;

- **POWER STATUS:** displays power or amperage appliance of **BUC**. Power or Amperage is in OK if it's value within acceptable limits and **ERROR** if out of limits. Device turn's off BUC if power or amperage parameters are out of limits. To set limits go to menu page **Redundancy Parameters**.
- **ALARM STATUS:** displays summary failure of BUC. **ALARM STATUS** is an analog signal, transmitted via M&C cable. **OK** if alarmed, **DISABLE** if unalarmed. Error in the case of port failure;
- **SERIAL STATUS:** displays port connection status. **SERIAL STATUS** is a digital signal, transmitted via M&C cable. **OK** if correct port connected, **ERROR** if port failure and **DISABLED** if port don't connected.
- **SERIAL PORT COMMUNICATION:** displays Redundancy communication with PC status.

Push button Redundancy Parameters which situated in the bottom of the page to change parameters of your device.
You will see next page:



Supply parameters — set here minimum/maximum parameters for voltage, power or amperage supply and waveguide switch motor voltage value:

Minimum DC – set here minimum value for Redundancy supply. This value:

- can't be lower than **Motor DC** value for proper Switch work
- can't be lower than minimum permissible working voltage for BUC or LNB.
- Minimum voltage value can't be lower than 12V;

Maximum DC – set here maximum value for redundancy supply. This value:

- can be higher than power supply **Motor DC** (In that case value will be lowered to needed automatically)
- can't be higher than maximum permissible working voltage for BUC or LNB.
- Maximum voltage value can't be higher than 55V;

Minimum Power/Current – set here minimum Power or Current (depend from the flag in **Watt/Ampere** field for each BUC or LNB and must be

lower than minimum power (current) value for BUC or LNB, but can't be lower than 0.02 A;

Maximum Power/Current – set here maximum Power or Current for each BUC and LNB and must be higher than maximum power (current) value for BUC or LNB, but can't be higher than 5 A;

Motor DC – set here nominal voltage value that written in specifications for your switch device.

REF Mode — chose between Autodetect and External reference frequency.

Watt/Ampere — chose what parameter will be shown in the Minimum/Maximum Power cells.

Redundancy Mode (in development) — chose operation mode for your Redundancy System. Power can be supplied for both BUC's (**Hot**) or only for the active one (**Cold**).

Power Supply Priority — set priority of device power supply. **Power Supply Priority** function searching available power supply and use it in the case that supply parameters are in setting limits. If supply parameters correct, device feeds in accordance to the established priority.

“0” – the highest priority

“2” – the lowest priority

Serial Interface — set parameters of Redundancy connection with BUC via M&C interface. Choose port you want to enable and set it parity, speed and bit rate (Bit rate speed depends on BUC version).

Alarm Enable— enable or disable summary BUC alarm via M&C cable.

Power Enable — enable or disable power supply alarm for BUC or LNB.

Push button **Set Parameters** to apply changes.

Login Password field: set new login or password here and push button **Set Login & Password** to apply changes.

Net Configuration field: read or change internet address of the device here and push button **Set Address** to apply changes.

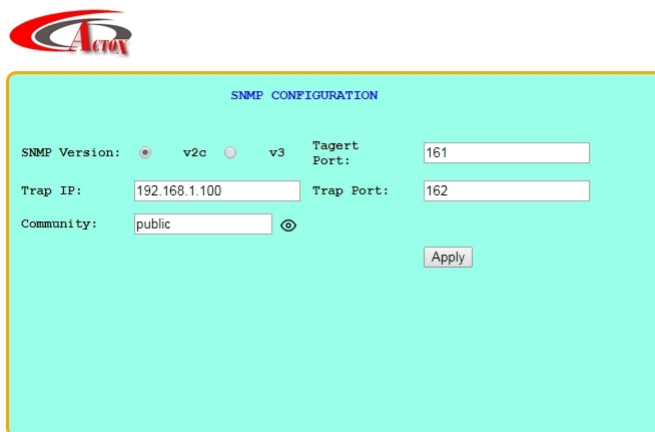
Push button Redundancy Status to return status page.

NOTE

All changeable values must be installed manually

VII. SNMP User Manual

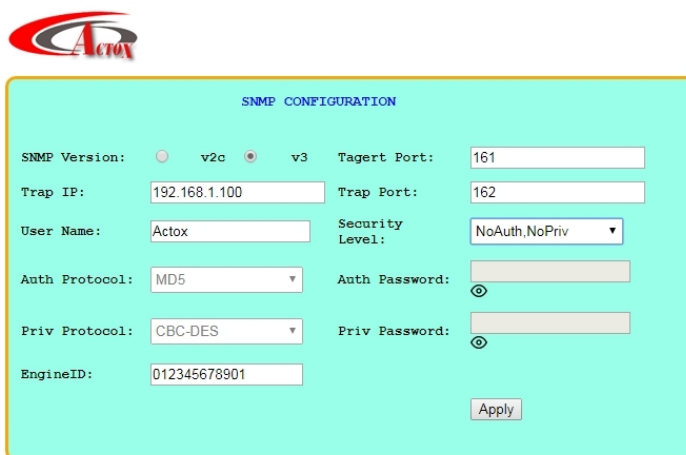
SNMP Configuration menu could be found in the bottom of the Web interface page. Depending on the SNMP version (**v2c** or **v3**) Configuration window will have the following appearance:



The screenshot shows the 'SNMP CONFIGURATION' window for version v2c. It features a light blue background with a yellow border. The Actox logo is in the top left. The configuration fields include: 'SNMP Version' with radio buttons for 'v2c' (selected) and 'v3'; 'Trap IP' set to '192.168.1.100'; 'Community' set to 'public' with an eye icon; 'Target Port' set to '161'; and 'Trap Port' set to '162'. An 'Apply' button is at the bottom right.

[Redundancy Status](#)

Figure 7.1 — SNMP Configuration page (v2c)



The screenshot shows the 'SNMP CONFIGURATION' window for version v3. It features a light blue background with a yellow border. The Actox logo is in the top left. The configuration fields include: 'SNMP Version' with radio buttons for 'v2c' and 'v3' (selected); 'Trap IP' set to '192.168.1.100'; 'User Name' set to 'Actox'; 'Auth Protocol' set to 'MD5'; 'Priv Protocol' set to 'CBC-DES'; 'EngineID' set to '012345678901'; 'Target Port' set to '161'; 'Trap Port' set to '162'; 'Security Level' set to 'NoAuth, NoPriv'; 'Auth Password' and 'Priv Password' fields with eye icons. An 'Apply' button is at the bottom right.

[Redundancy Status](#)

Figure 7.1 — SNMP Configuration page (v3)

Main differences between versions are in security levels, so v3 provides possibility to choose Authorisation and/or Privacy parameters of connection.

- **Trap IP** — IP address of the device which will receive traps from Redundancy (**192.168.1.100** by default).
- **Target Port & Trap Port** — default values for SNMP connection.
- **Community** — Password for connection with SNMP browser (**public** by default).

NOTE

For applying changes you need to reboot Redundancy

As example SNMP connection between PC and Redundancy provided via **MibBrowser**. Main window of this program have the following appearance:

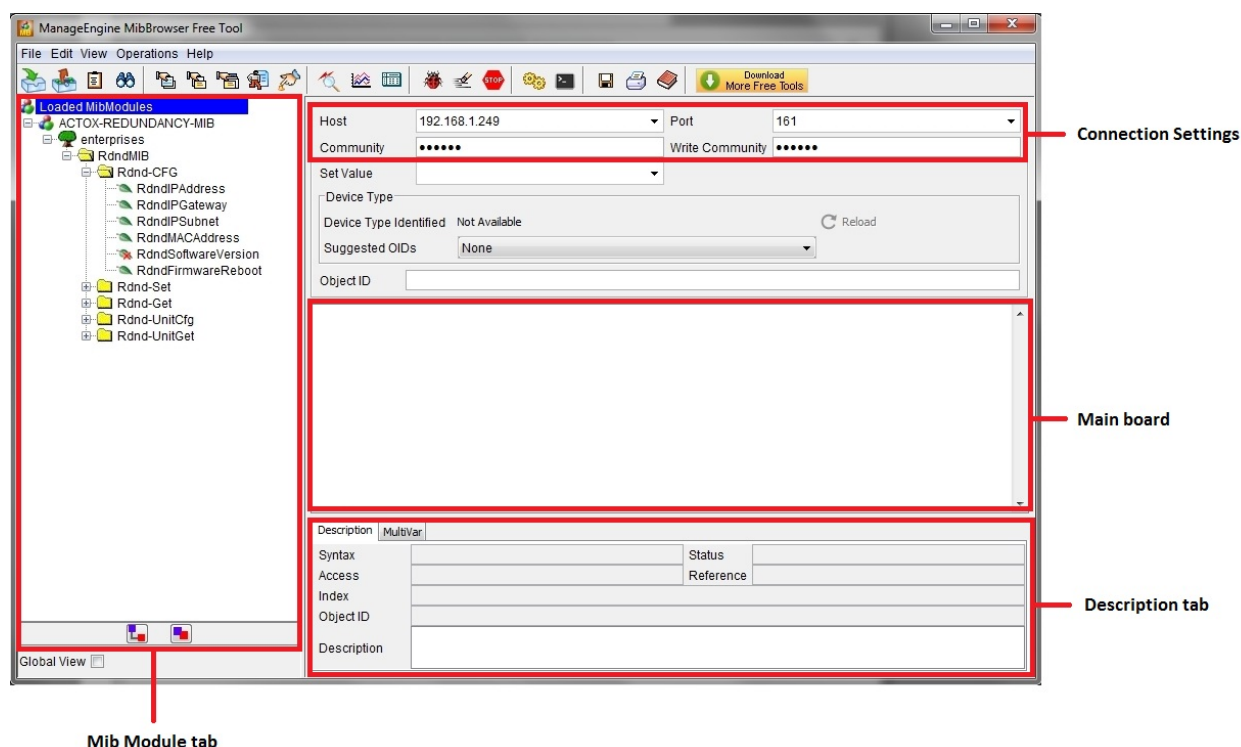


Figure 7.3 — MibBrowser Main Window

- **Mib Module Tab** — displays loaded MIB modules.
- **Connection Settings** — parameters for connection with Redundancy.
 - **Host** — Redundancy IP address (192.168.1.249 by default).
 - **Community/Write Community** — password for connection with Redundancy (public by default)
- **Main board** — displays write/read values of loaded MIB modules.
- **Description tab** — displays commands description.

Press on submenu tab **Edit** —> **Settings** to choose SNMP connection version.

NOTE

For SNMP v3 must be added new settings tab

Press button  to choose load MIB module (by default **ACTOX-REDUNDANCY-MIB.MIB**).

MIB module contains two types of files: read/write () and read-only ().

- To read needed value from Redundancy place cursor on it and press **right button**—> **GET** on your mouse.
- To set value, type it data in **Set Value** cell and press **right button**—> **SET**.

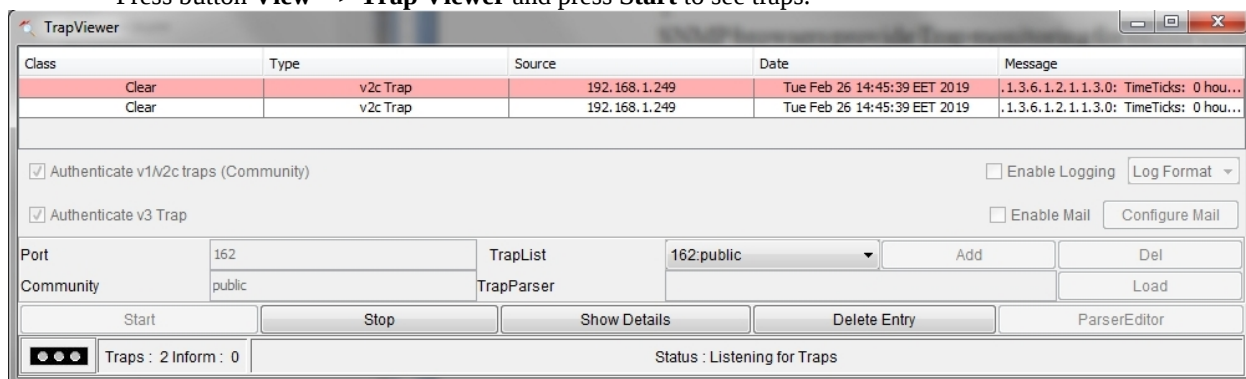
All applied requests and changes will be displayed on the main board.

CAUTION

*Data from **Set Value** cell won't disappear after applying changes, so you need to delete it manually to prevent mistakes.*

SNMP browsers provide Trap monitoring for online control of the device. Traps contain information about device and description of the changed parameters or errors.

Press button **View**—> **Trap Viewer** and press **Start** to see traps.



Class	Type	Source	Date	Message
Clear	v2c Trap	192.168.1.249	Tue Feb 26 14:45:39 EET 2019	.1.3.6.1.2.1.1.3.0: TimeTicks: 0 hou...
Clear	v2c Trap	192.168.1.249	Tue Feb 26 14:45:39 EET 2019	.1.3.6.1.2.1.1.3.0: TimeTicks: 0 hou...

☒ Authenticate v1/v2c traps (Community) ☐ Enable Logging Log Format ▾

☒ Authenticate v3 Trap ☐ Enable Mail Configure Mail

Port: 162 TrapList: 162:public Add Del

Community: public TrapParser Load

Start Stop Show Details Delete Entry ParserEditor

Traps : 2 Inform : 0 Status : Listening for Traps

Figure 7.3 — Trap Viewer