Technical Specification

Rhapsody LED Display

Model No 3.32

Confidential

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1 INTRODUCTION

This document provides a technical specification for the Rhapsody LED Display. Various models exist in the Rhapsody range; this specification takes Model No 3.32 as an example.

The following items are included:

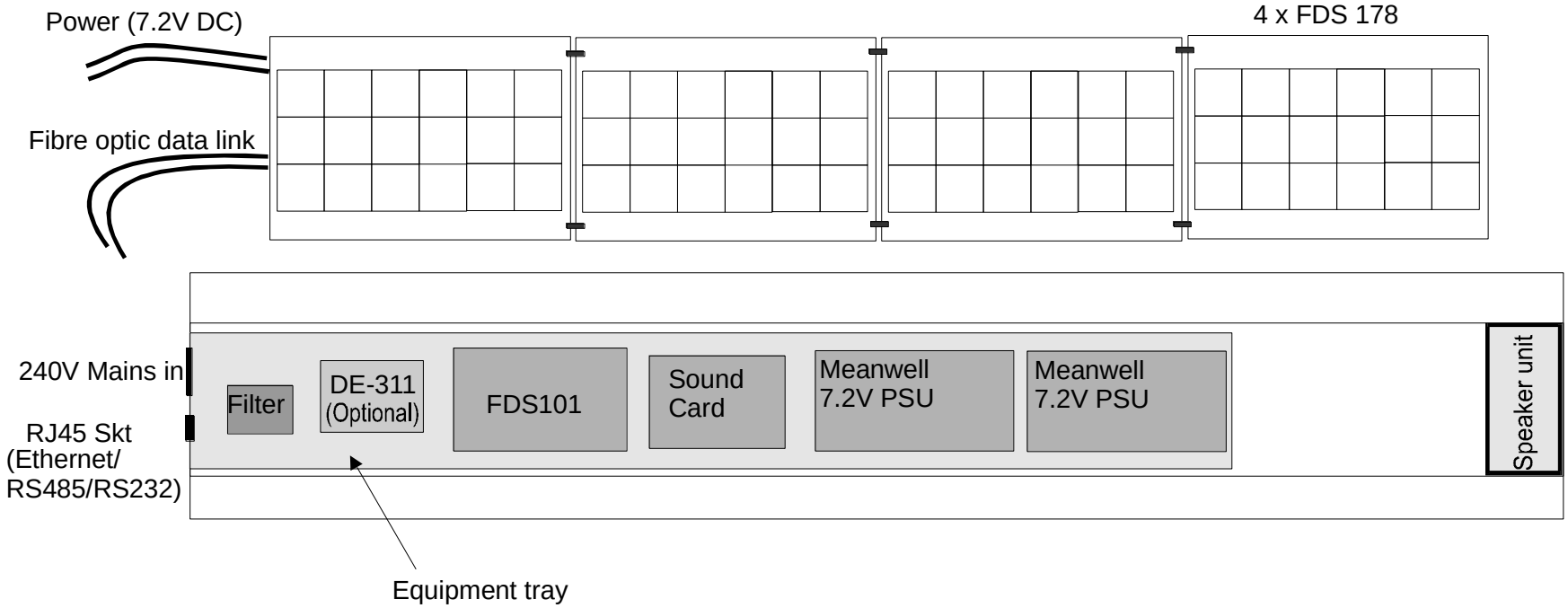
- Technical description
- Electrical specification
- Mechanical specification
- Parts lists
- EMC conformities
- Hardware layout and wiring diagrams
- Temperature test characteristics

2 DESCRIPTION

The Rhapsody display is an Aurora64 UDP based LED display with the following features:

- Tri-colour 24 x 192 full matrix display
- 3 Lines of 32 characters
- 50 or 100mm character height
- 240V operation
- Optional RS485/RS232/Ethernet (10/100) communication.
- Selectable baud rate
- FDS101 LED controller.
- Extended UDP Protocol interface
- Anodised Aluminium extrusion housing.
- 1626 x 258 x 85 mm Housing
- Weight 16.5 Kg
- Audio messaging/ indication facility.
- Wall or ceiling mounting

Rhapsody - General Layout



3 ELECTRICAL SPECIFICATION

Included in this section are wiring details, electronic component specifications and electronic operation parameters.

3.1 CONTROLLER

The Rhapsody display uses the Frens FDS101 (V4.01) LED controller. It has the following specification:

Power supply	7.5v – nominal
Serial comms	RS232; RS485/422
LED Data Link	Fibre optic/TTL option
Microprocessor Watchdog	Onboard
RAM (battery-backed)	32/ 128K (selectable)
Real-time clock	On board
Temperature sensor	External (optional)
Brightness sensor	External (optional)

Baud rate and network address are selectable from on-board DIP switches (see next section). The DIP switch has been mounted in such a way as to be accessible from the rear of the display through a cut-out.

Communication to the display depends upon the Rhapsody model number. Pin headers are available on the FDS101 for all options.

3.2 CONTROLLER DIP SWITCH SETTINGS

The controller DIP switches may be accessed from a cut-out on the rear of the display.

Switches 1 ➔ 4 set the network address:

Switch1	Switch2	Switch3	Switch4	Network No
OFF	OFF	OFF	OFF	0
ON	OFF	OFF	OFF	1
OFF	ON	OFF	OFF	2
ON	ON	ON	ON	15

Switches 5 & 6 set the Baud Rate

Switch 5	Switch 6	Baud Rate
ON	ON	1200
OFF	ON	2400
ON	OFF	9600
OFF	OFF	19200

Switches 7 & 8 set the various test modes:

Switch 7	Switch 8	Test function
ON	ON	Info Screen
OFF	ON	Alternate
ON	OFF	Stripe
OFF	OFF	Normal

NOTE : After setting DIP switches, display power must be cycled for changes to be updated

3.2.1 TEST FUNCTIONS

Normal Mode

After testing, both switches must be set to OFF for normal operation.

Info Screen

This selection allows the wallboard to show the following information upon power up:

- V Eprom version fitted
- N Network number in Hex
- B Baudrate

Stripe Test

Stripe test will generate a set of moving yellow stripes continuously flowing across the display following power up. This may be used to show that the power connection, display column and row drive circuits are functioning correctly.

Alternate

This test will display alternate third full screens of green, red and blank to prove that all LEDs are active.

NOTE : The display **must not** be left running in "Alternate" mode for more than 30 seconds

3.3 SOUNCARD

The FRENS "Sound-Wav" soundcard gives the Rhapsody its audio capability. Up to 60 seconds of digital audio sound data are stored in non-volatile memory. The data is accessed via the FDS101 and fed out to a single 8 ohm 10W speaker through the sound card's integral amplifier.

3.4 LED PSU

2 x Meanwell PSU's provide the power for the display boards. They have the following specification:

Model Number	S-100F-7.5
Supply Voltage	240/120V ac
I/P Current @ 100 – 120V	3.15A
I/P Current @ 200 – 240V	1.5A
Output Voltage	7.5V DC
Output Current	13.3A
Power Rating	100W

3.5 LED DISPLAY

4 x FDS178 PCB's provide the display area. The boards have a fibre optic data interface and are powered from the 7.5V Meanwell PSU's.

Specification:

Supply	7.5V – nominal
Display Tiles	8 x 8 Tri-colour Full Matrix
Display Area	1370 x 120 mm
Data Interface	Fibre Optic

3.6 COMMUNICATIONS

There are 3 communication options with the Rhapsody:

RS232	No handshaking
RS485/422	Full Duplex
Ethernet	Via device server

RS232 and RS485 will be available with the provision of an external flying lead terminated with an RJ45 connector. (see Appendix 2 for details).

The ethernet option for communication will be made via an RJ45 socket on the Rhapsody end-plate.

NOTE : Ethernet option for communication is only available when an RJ45 socket is present on the Rhapsody endplate

3.6.1 DEVICE SERVER

The Device Server (optional) has the following specification.

Type	Lantronix UDS10
Model No	UDS10
Power supply	7.5v DC
Speed	10Mb/S

NOTE : A separate power supply may be fitted depending upon the type of Device Server used

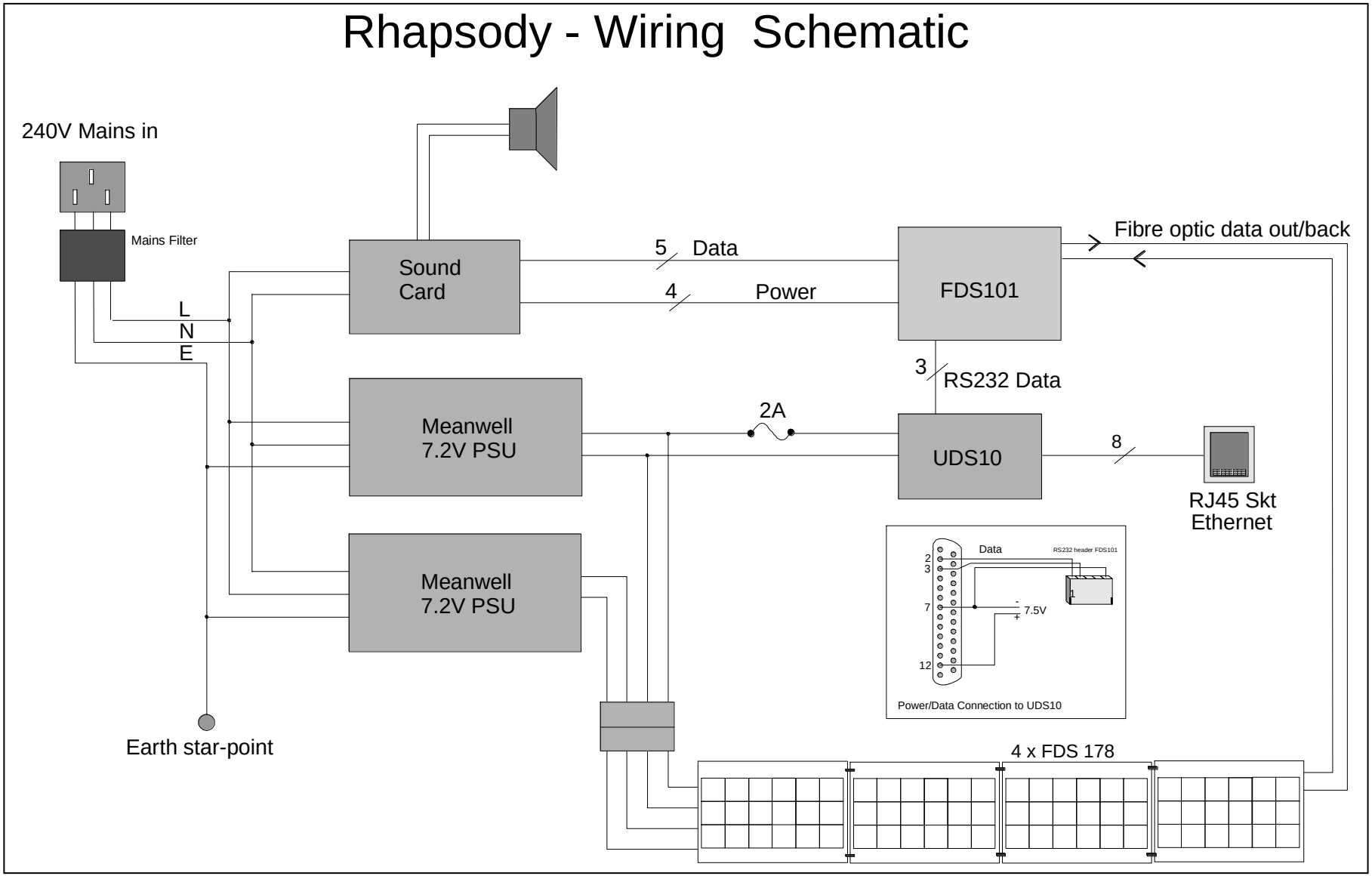
Please refer to Appendix 1 for information on Device Server setup.

4 ELECTRICAL PARTS LIST

Ferrograph Part No.	Description	Supplier/Contractor Part No. / Ref.No.	Qty	Supplier/ Manufacturer
	Equipment Plate assembly			
	PSU 7V5 Meanwell	S-100F - 7.5	2	FRENS
	10A Mains Filter (Schaffner- FN332-10/05)	217-0735	1	RS
	IEC Male Panel mout plug	481-623	1	RS
	Insulation Boot	240-400	1	RS
	Logic Controller FDS101 (V4.01)	FDS101	1	FRENS
	"SoundWav" Soundcard	SOUNDWAV	1	FRENS
	Device Server (Nport Express OEM)	DE-311M	1	CAPTEC (ethernet version only)
	Device Server PSU (5v)	PW00733	1	CPC (ethernet version only)
	Mains lead (fig 8)	PL02009	1	CPC
	Cables and connectors			
	RJ45 Panel Clip Faceplate	229-1680	1	RS
	RJ45 SKT cat 5 unshielded	229-1602	1	RS
	RJ45 plug	CN04673	1	CPC
	4 way PC power plug (pin)	299-479		Farnell
	4 way PC power plug (socket))	148-085		Farnell
	Pin contact (per 100)	299-558		Farnell
	Socket contact (per 100)	149-091		Farnell
	Molex 4-way plug	22 01 2045	2	Molex
	Molex 5-way plug	22 01 2055	2	Molex
	Molex Crimp pins (per 100)			
	Other bits of cabling to be added…			
	Display Boards			
	24x48 Full Matrix Tricolour LED	FDS178	4	FRENS

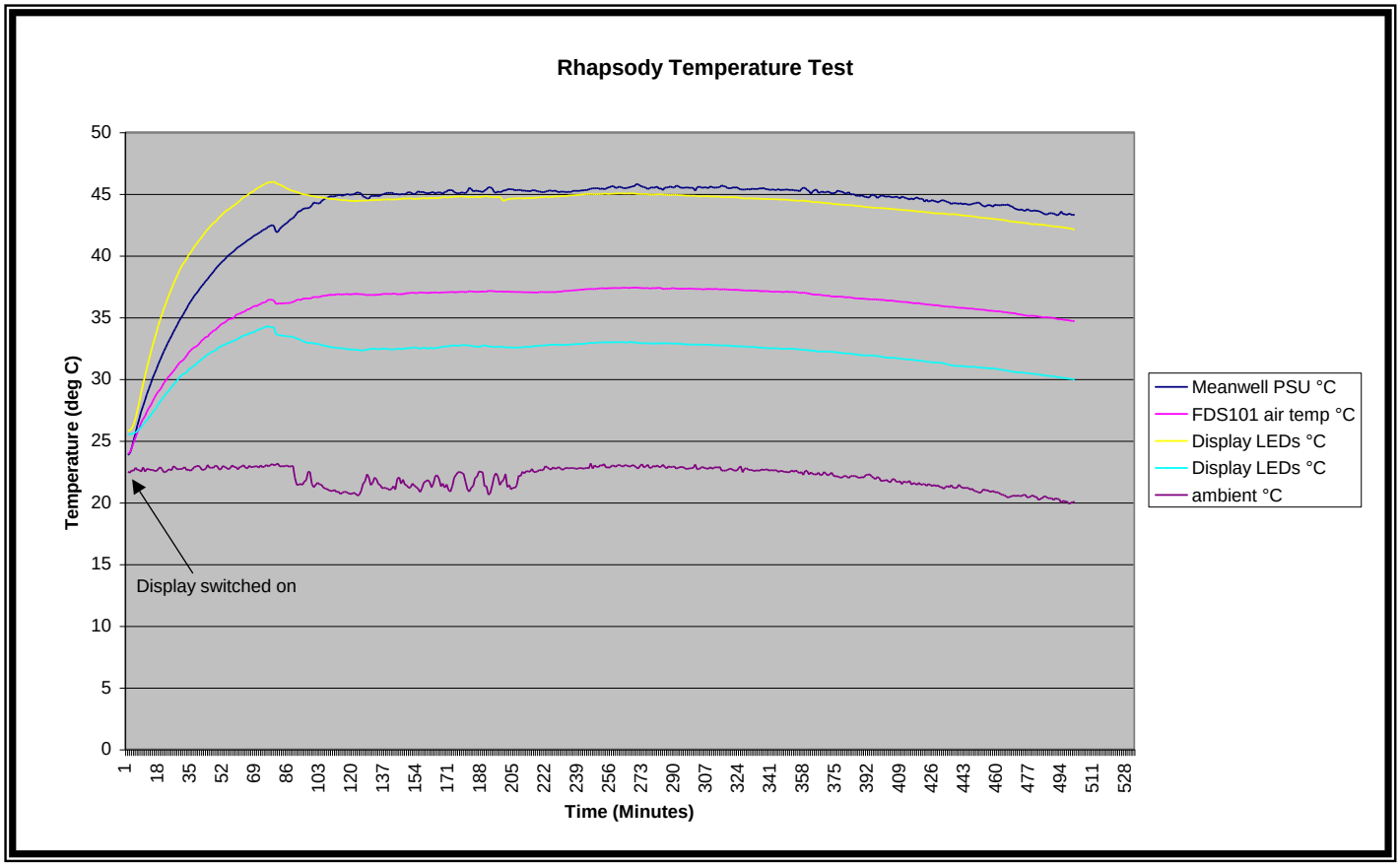
5 ELECTRICAL SCHEMATIC

The following page details the Rhapsody wiring schematic.


Rhapsody - Wiring Schematic
240V Mains in
Mains Filter
L
N
E
Earth star-point
Sound Card
5 Data
4 Power
FDS101
Fibre optic data out/back
3 RS232 Data
2A
Meanwell 7.2V PSU
Meanwell 7.2V PSU
UDS10
8
RJ45 Skt Ethernet
Data
RS232 header FDS101
2
3
7
12
1
-
+
7.5V
Power/Data Connection to UDS10
4 x FDS 178

6 TEMPERATURE TEST CHARTS

The temperature characteristics for the Rhapsody are represented in the following graph:



The air temperature within the display maintains a 15 degC rise above ambient temperature. The hottest parts of the unit – namely the PSU chassis metalwork – runs at about 22 degC above ambient.

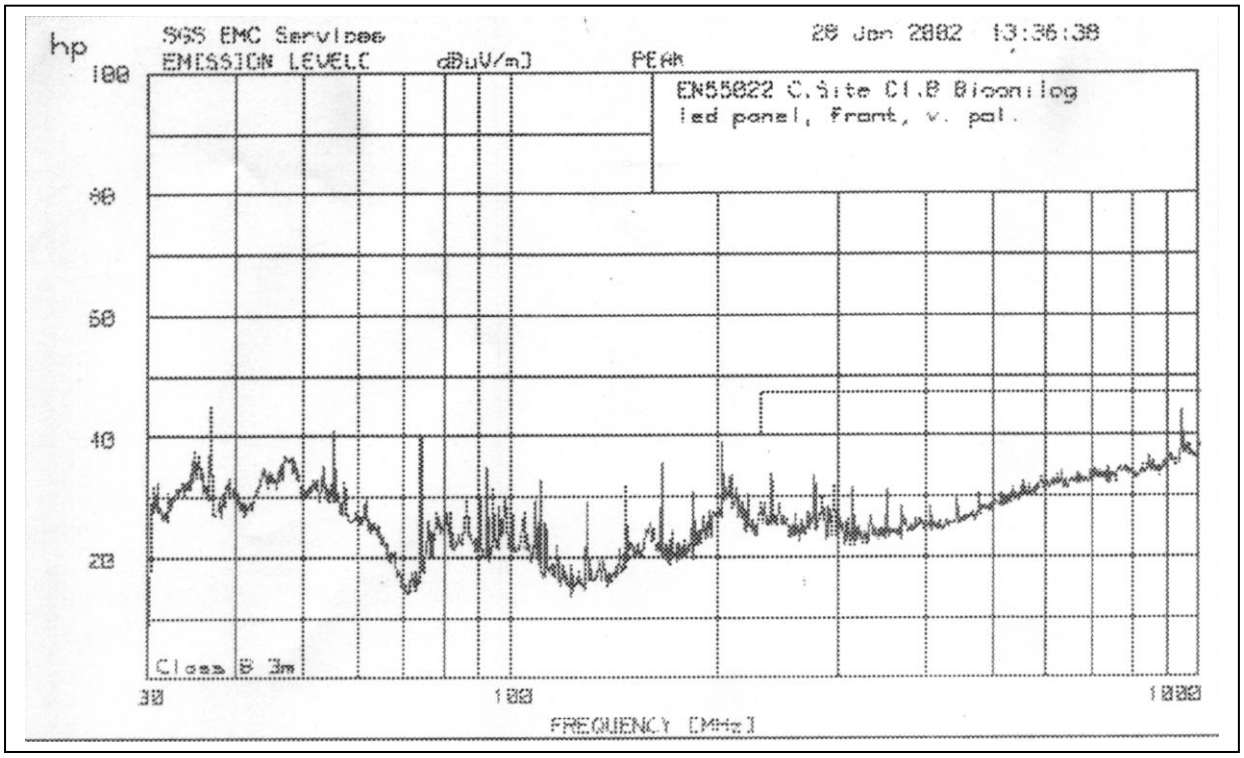
NOTE : The disparity between the two LED temperatures is a result of the thermocouples being placed over active/non active regions of the display area.

7 EMC COMPLIANCE

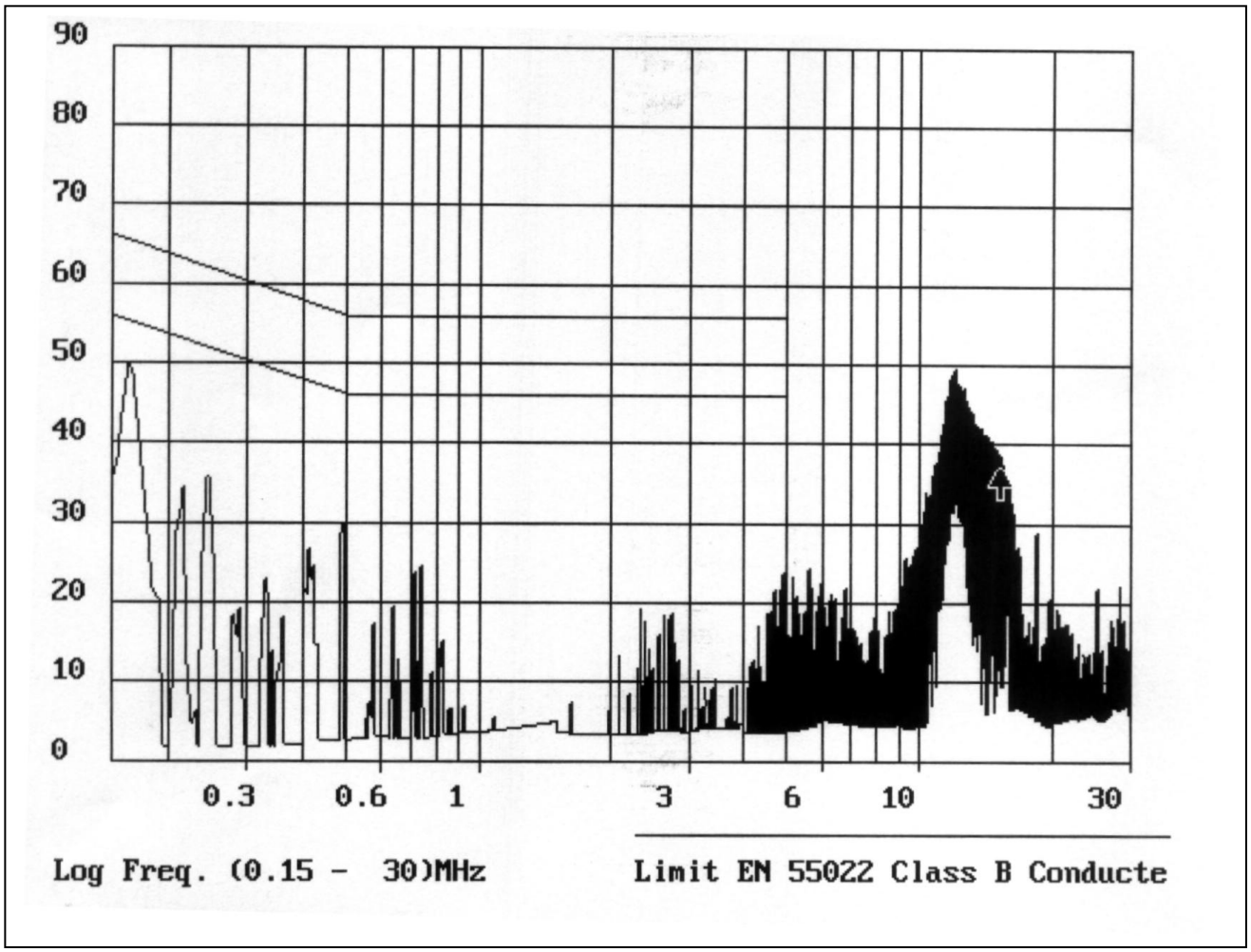
The Rhapsody display has been designed to meet the following EMC directives for Information Technology Equipment.

- EN55022 ClassA
- EN55024
- EN61000-3-2/ -3-3

7.1 RADIATED EMISSIONS GRAPH

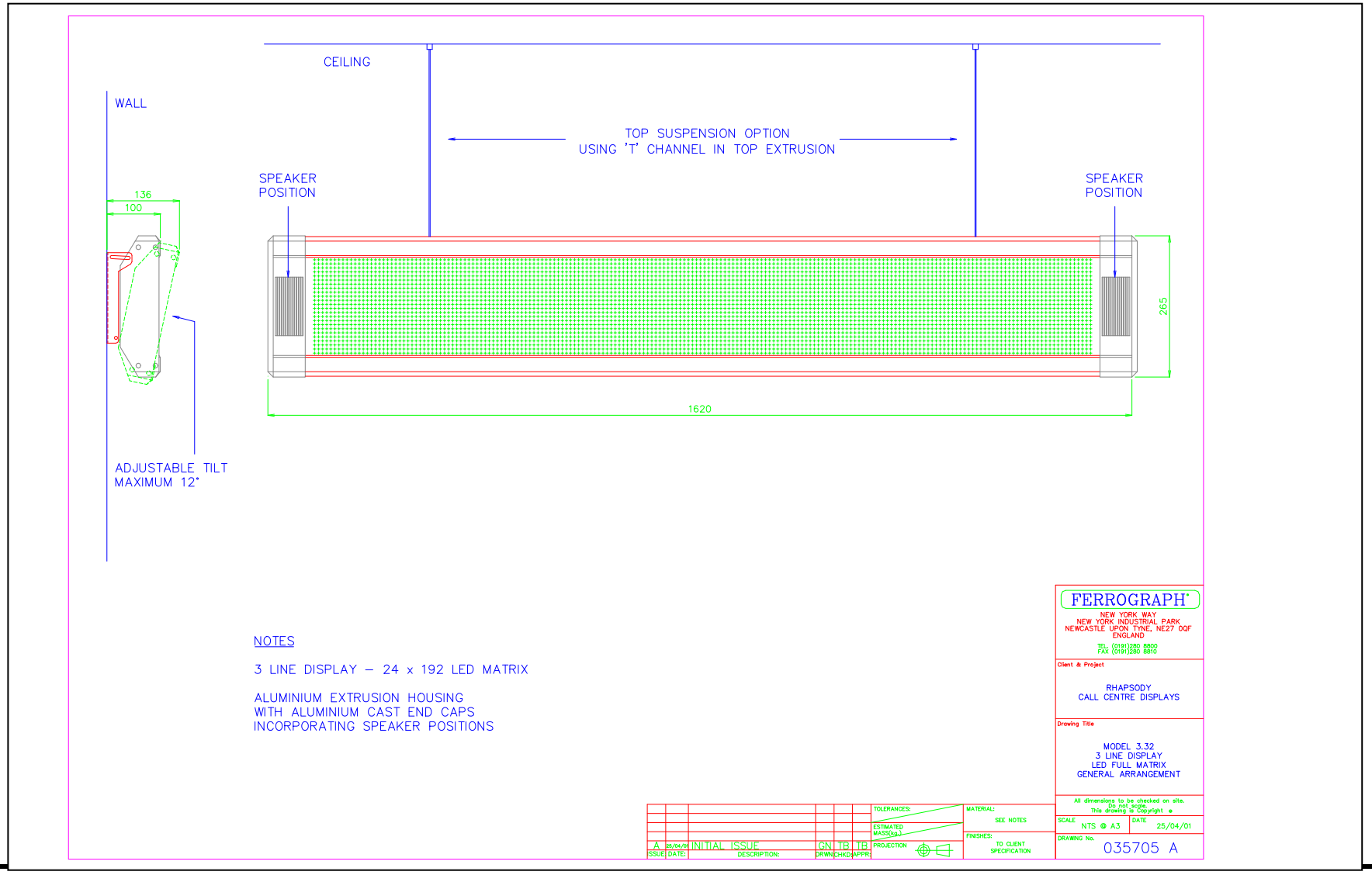


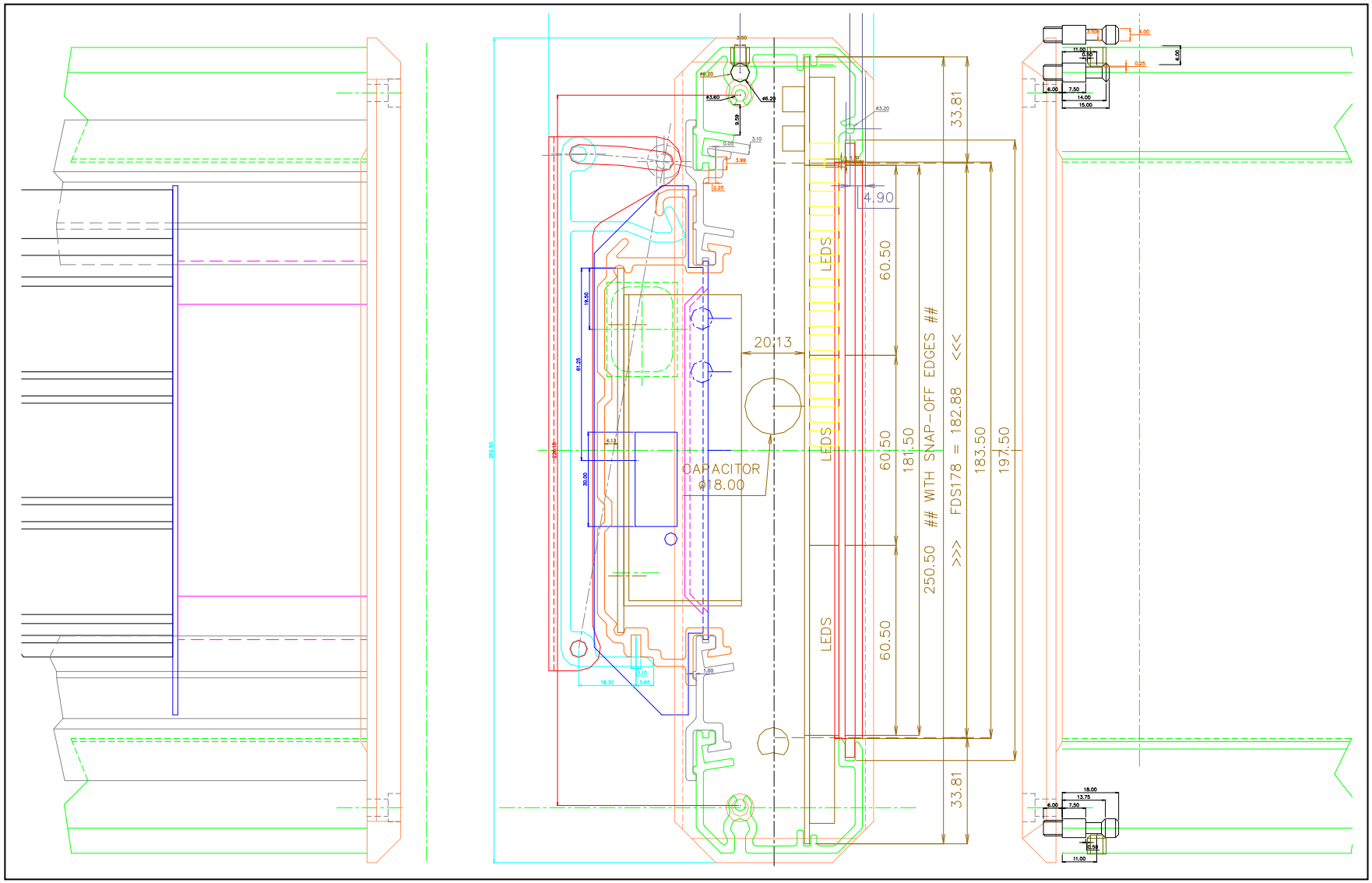
7.2 CONDUCTED EMISSIONS GRAPH



8 MECHANICAL DETAILS

Refer to Mechanical Technical Specification


CEILING
WALL
TOP SUSPENSION OPTION
USING 'T' CHANNEL IN TOP EXTRUSION
SPEAKER POSITION
SPEAKER POSITION
136
100
265
1620
ADJUSTABLE TILT
MAXIMUM 12°
NOTES
3 LINE DISPLAY – 24 x 192 LED MATRIX
ALUMINIUM EXTRUSION HOUSING
WITH ALUMINIUM CAST END CAPS
INCORPORATING SPEAKER POSITIONS
FERROGRAPH
NEW YORK WAY
NEW YORK INDUSTRIAL PARK
NEWCASTLE UPON TYNE, NE27 0QF
ENGLAND
TEL (0191)280 8800
FAX (0191)280 8810
Client & Project
RHAPSODY
CALL CENTRE DISPLAYS
Drawing Title
MODEL 3.32
3 LINE DISPLAY
LED FULL MATRIX
GENERAL ARRANGEMENT
All dimensions to be checked on site.
Do not scale.
This drawing is Copyright ©
SCALE NTS @ A3
DATE 25/04/01
DRAWING No. 035705 A
A 25/04/01 INITIAL ISSUE
ISSUE DATE: DESCRIPTION:
GN TB TB
DRWN CHKD APPR
TOLERANCES:
ESTIMATED MASS(kg.)
PROJECTION
MATERIAL: SEE NOTES
FINISHES: TO CLIENT SPECIFICATION


33.81
4.90
60.50
60.50
60.50
20.13
LEDS
LEDS
LEDS
CAPACITOR
ø18.00
250.50 ## WITH SNAP-OFF EDGES ##
>>> FDS178 = 182.88 <<<
181.50
183.50
197.50
33.81

Appendix 1 Device Server Setup

At the time of writing, the following device servers, coupled with the specified software applications, have been found to operate satisfactorily with the Rhapsody unit.

Device Servers Tested:

- Moxa Nport Express DE-311
- Lantronix UDS10 (firmware release V4.5)

Software:

- UDPTWin V1.2.0.11 (2002)
- Lantronix Comport Redirector - RDCfg V2.0/2
- Lantronix DeviceInstaller.exe (V2.0)
- Qmaster (aka AgentView)

There are 2 parts to the setup procedure: server firmware and application software setup.

NOTE : Configuration of the devices is specific to the control application. Follow UDP **OR** Qmaster setup procedure

A1.1 *Device Setup - UDP*

All setup is done over a network link to the device servers. If the device server is connected directly to the host PC, remember to use a cross patch lead.

A1.1.1 LANTRONIX UDS10

It is recommended that Lantronix "DeviceInstaller.exe (V2.0) is used to configure the UDS10. This is a handy utility which can take care of both firmware upgrades as well as device setup. The application is available for download at Lantronix.com.

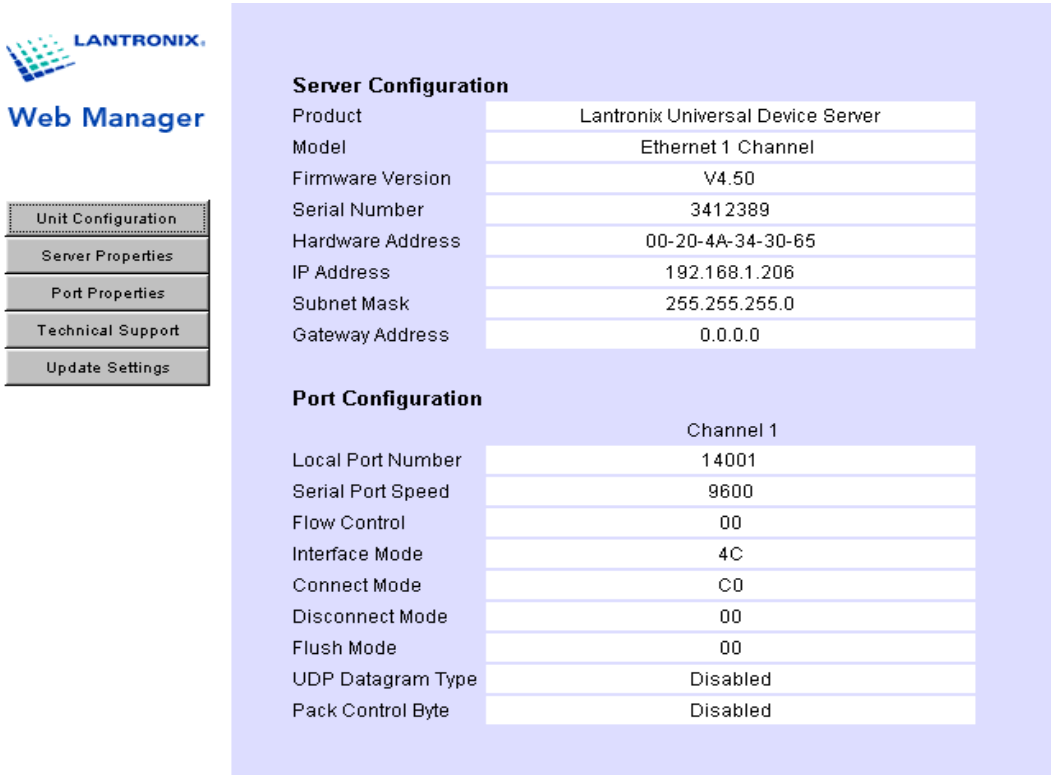
Start the application and select the IP menu button. Enter the MAC address for the unit and select the IP address you wish to assign.

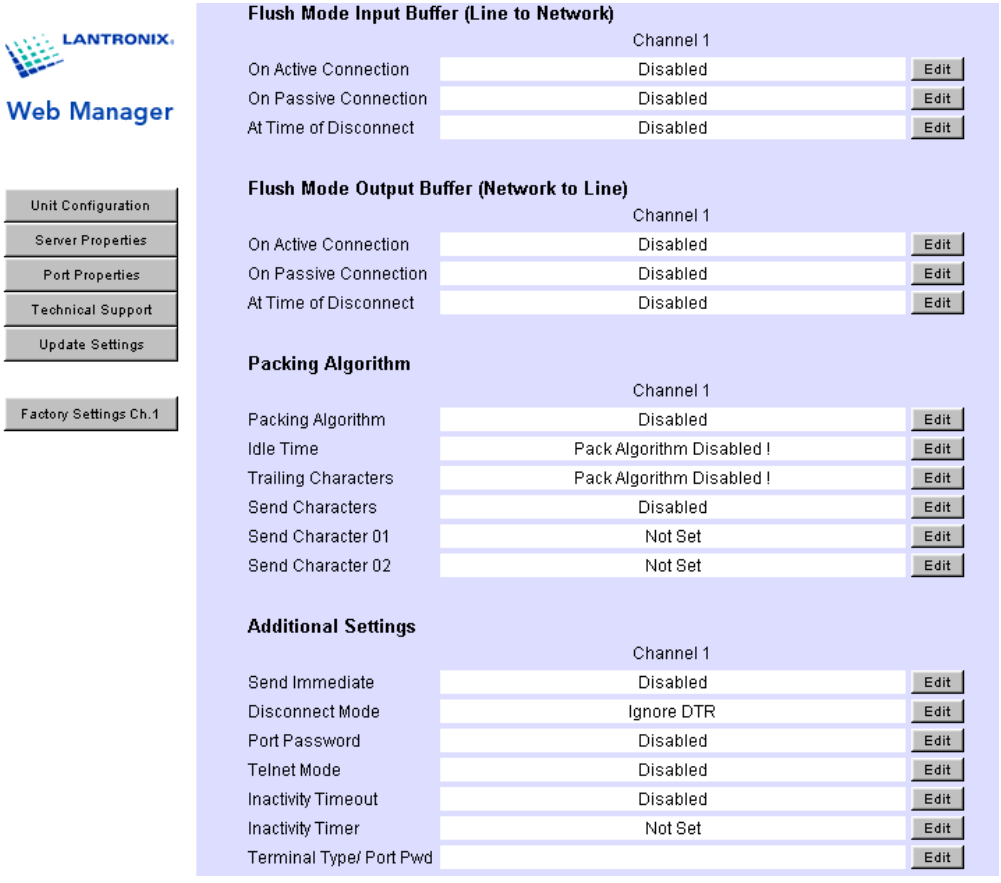
Select "Query device" to determine firmware revision

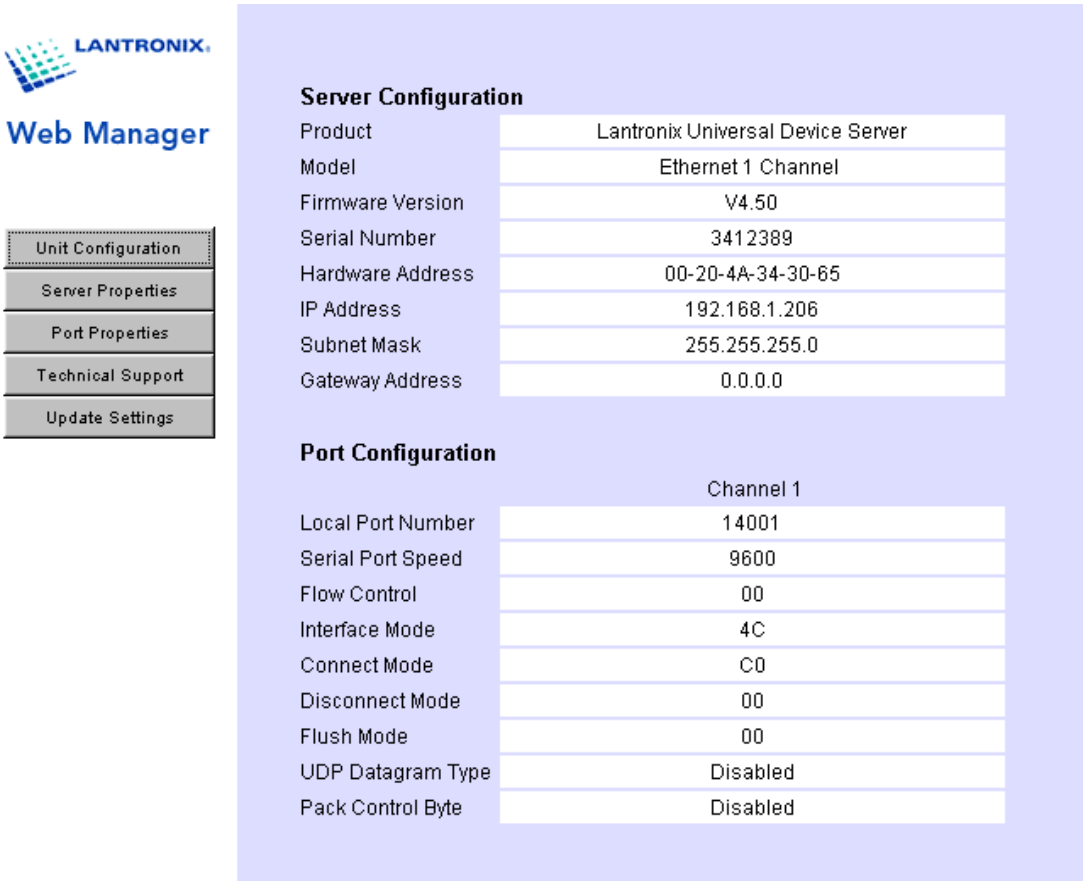
Ensure that revision is V4.5 or later.

Latest revisions are available from the website and ***.ROM files can easily be uploaded to the server using DeviceInstaller - "Upgrade Firmware" utility.

Select: Tools > Device Manager to enter UDS10 setup. You may now choose to set up the device using Telnet or Web-browser config utilities. Either utility will allow the following configuration to be achieved.



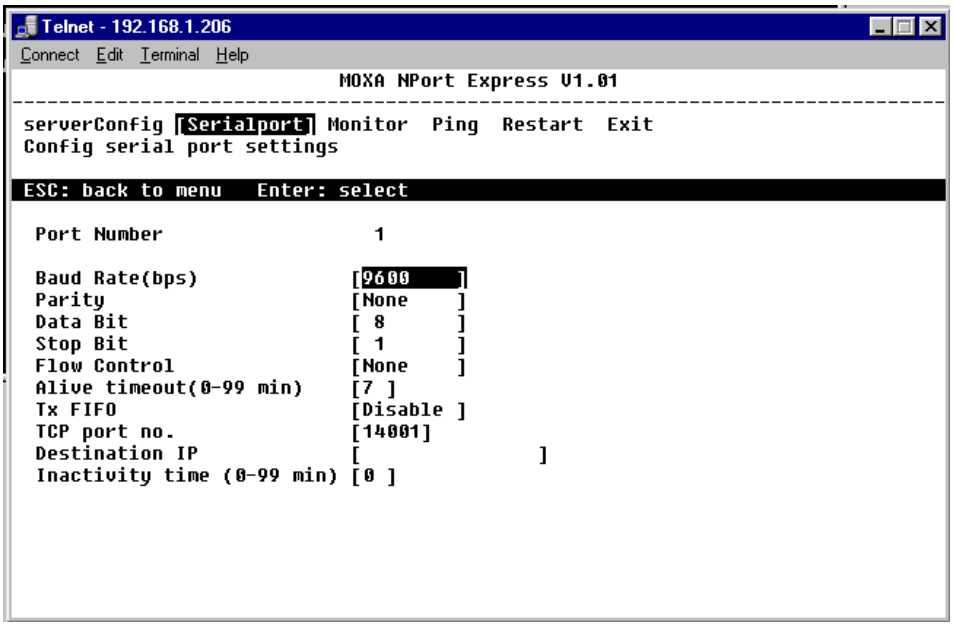


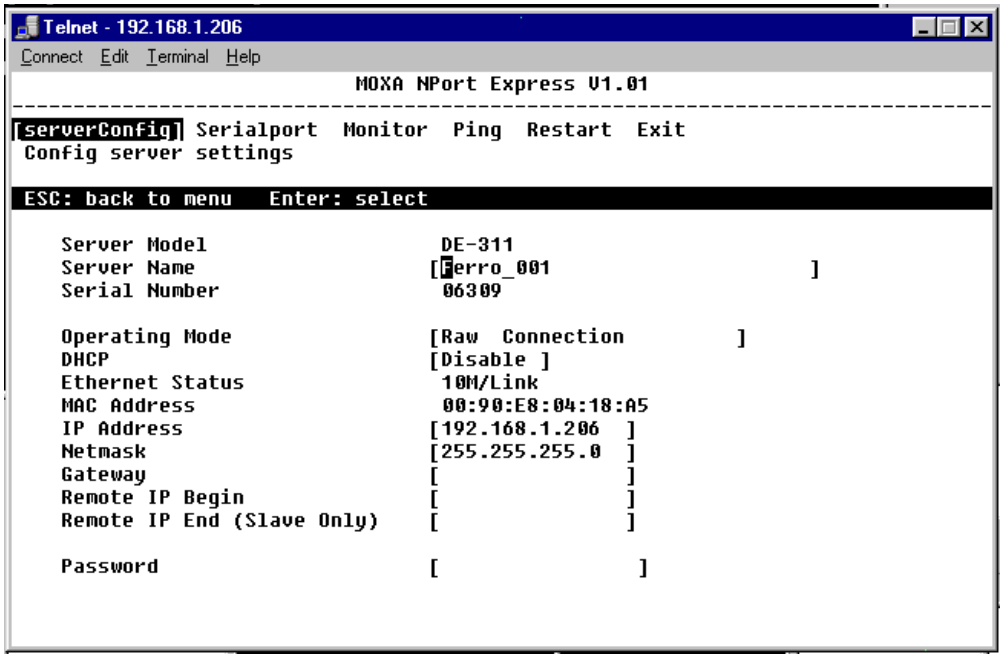


A1.1.2 NPORT EXPRESS DE-311

Refer to Nport Express User Manual to assign IP address to the Device Server.

Telnet the Device and set up the Serial Port and ServerConfig as following screen shots:





NOTE : It is a specific requirement of the Redirector software that the TCP port number is set to 14001.

A1.2 *Application software setup*

A1.2.1 UDPTWIN V1.2.0.11 (2002)

UDPTWin V1.2.0.11 (2002) is designed for RS232 PC com port communications. In order for it to communicate with the Serial Device Servers, the Lantronix ComportRedirector application must be employed.

The redirector allows up to 80 virtual com ports to be redirected to the PC network interface; allowing the serial device/application to be implemented over that network.

- Open Redirector application and select a suitable unused com port for redirection (eg COM3)
- Enter IP address of unit with which coms is to be established.
- Set TCP port number to 3001. (Note: Port number must be between 3000 and 3009. The corresponding Device Server TCP port number must be 11000 higher; as in above example)
- Reboot PC for com-port changes to be accepted.
- Run UDPTWin and setup serial port to suit.
- Load Rhapsody display parameters and request SEND. Window box will appear confirming redirection is taking place.

Appendix 2 RS485 Network - Cabling Details

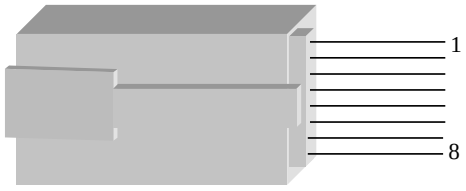
The flying lead, supplied for serial comms displays, supports both RS232 and RS485 communication. In each case the internal connection to the FDS101 must be matched to the serial comms required.

So for RS232 communication the 5 pin Molex plug must be connected to the header marked “RS232”

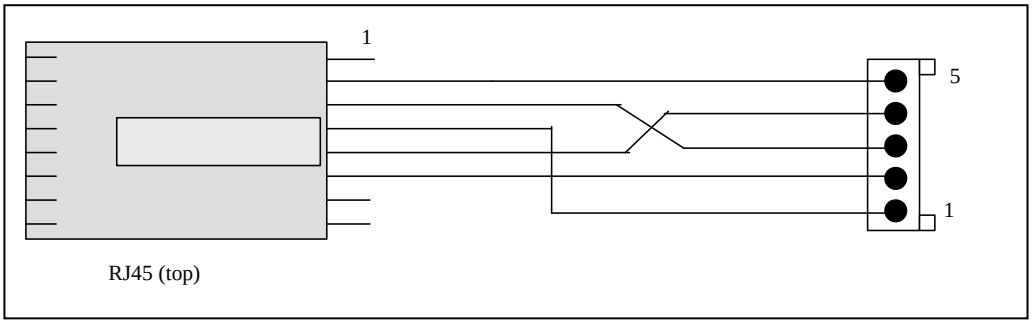
And for RS485 communication the plug must be connected to the header marked “RS485”

A2.1 *Communication cable pinout*

RJ45 Pin # (Flying Lead)	RS485 sig	RS232 Sig	Molex pin # (FDS 101)
8			
4	Tx (+) ←	Tx ←	1
5	Tx (-) ←	Rx →	2
3	Rx (+) →		3
6	Rx (-) →		4
2	Gnd	Gnd	5
1			



RJ45 free plug pinout



RJ45 (top)