e2v

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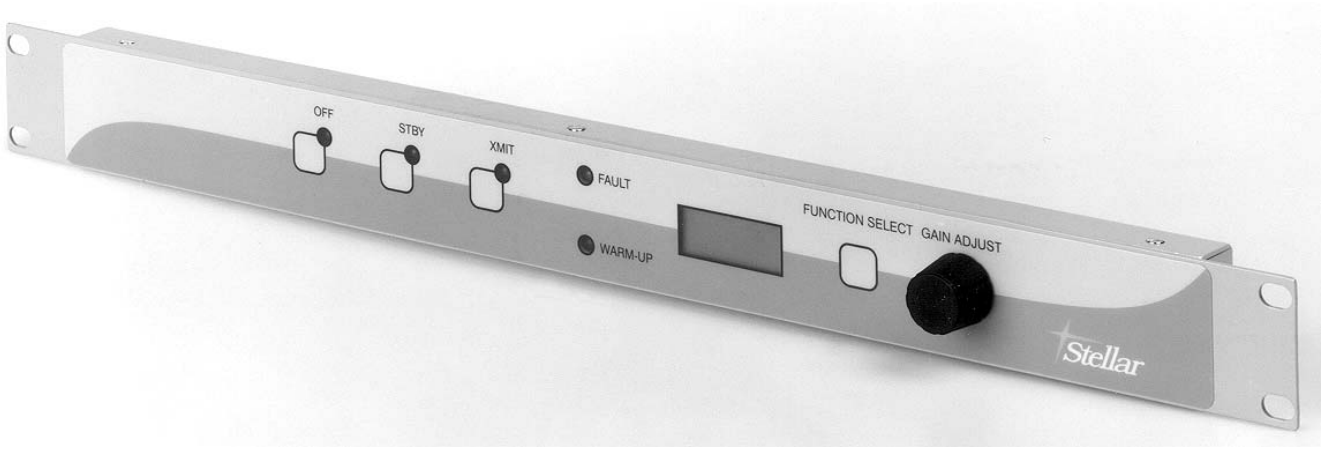
Stellar

N6081 Series

Operation Manual



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Stellar N6081 Series Operation Manual

CE

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SAFETY NOTES

The following warnings and precautions are for your safety and the prevention of injury. Read them carefully and observe at all times when installing or operating the N6081. Hazard warning signs, as defined in BS5378 Safety Signs and Colours are used on the equipment to highlight any possible hazards.

Mains Supply (Amplifier Only)

A mains supply disconnection device must be provided to isolate the amplifier from the mains supply source. Either a socket outlet or a two-pole isolation switch must be used as the mains supply disconnection device, and it must be easily accessible. The mains connector must not be used as the mains supply disconnection device.

RF Radiation

Exposure of the human body to microwave radiation can constitute a hazard (ANSI/IEEE C95-1-1992). Personnel must be protected from microwave energy within the RF system.

All RF connectors must be correctly fitted before operation, so that there is no leakage of RF energy. The control unit must not be operated unless the RF output connection is correctly terminated. It is particularly hazardous to look into open waveguides, coaxial feeders, or transmitter antennae when the control unit is operating.

High Temperature

High power RF loads connected to RF systems can be at temperatures in excess of 80 °C.

Maintenance

Do not remove the covers unless the supply is disconnected. The supply should not be reconnected until all of the covers have been refitted.

ENVIRONMENTAL

- Do not spray aerosol cleaners directly on to its surfaces when cleaning.
- Do not spill water onto the control unit.
- Do not operate the control unit on an unstable or unsafe surface.
- Do not install the control unit in a damp area.
- Do not expose the control unit to rain or other sources of water.
- Ensure that all cables cannot be walked on, tripped over or damaged by furniture or movable equipment.
- Do not place objects inside any of the waveguides.

STANDARDS COMPLIANCE

This control unit complies with the following requirements. Further details may be provided if necessary.

- EEC Directive 89/336/EEC Electromagnetic compatibility.
- EEC Directive 93/97/EEC Satellite earth station equipment.
- EEC Directive 73/23/EEC Low voltage directive

e2v technologies' quality management system is certificated to the requirements of ISO 9001.

CUSTOMER CARE

Stellar 24-Hour Hotline

In the event of a Stellar product fault or urgent application enquiry, dial the Stellar Hotline telephone number given below.

At the rear of this manual you will find a blank 'Fault Report Form'. Complete this form before ringing the Hotline; this will help us to respond promptly to your request.

Telephone: (01245) 355398

International: +44 1245 355398

CONTENTS

1 Thank You For Buying Stellar

Thank you for buying this Stellar product. This e2v technologies control unit allows the remote control of one Stellar amplifier.

Before using your new control unit, we recommend that you spend a little time reading this manual to familiarise yourself with its operation and features.

If you have any further questions, or recommendations on this manual, contact your distributor.

2 Care of the Control Unit

2.1 Storage

- Store the control unit in its normal horizontal orientation
- Storage temperature range is from −40 to +70 °C.
- Do not use control unit boxes to support the weight of any other item.
- Retain the control unit boxes for future use.
- Avoid severe shocks.

2.2 Handling

The control unit nominally weighs 0.5 kg; no special handling precautions are required.

2.3 Unpacking

Only install and use the control unit within the specified environmental limits.

2.4 Cleaning

The control unit is designed to be rack mounted and is for use in protected environments.

The front panel can be cleaned with a damp cloth. Do not use detergents or other cleaners without consulting e2v technologies. The control unit must be disconnected from the Stellar amplifier before cleaning.

3 Installation Considerations

3.1 Mounting

The control unit is designed to be installed in a standard 19-inch rack mount system and should be mounted and operated in the normal horizontal orientation.

Fixing holes of the standard pattern are provided on the 1U front panel; these provide adequate support for the unit.

The control unit is designed to be mounted remote from the amplifier and the RF system.

When designing the installation, a space of approximately 100 mm should be allowed behind the rear panel of the control unit for the disconnection of and the bend radius of the interconnection cable.

3.2 RF Connections

Always disconnect the interconnection lead from the control unit to the amplifier before installing or removing any RF system components.

3.3 Cooling Considerations

The control unit is designed to operate in ambient temperatures between 0 and +50 °C; it requires no additional ventilation. Care should be taken when choosing the location of the control unit, to avoid external heat sources that may lead to the ambient temperature exceeding the above limit.

3.4 Interface Connections

As there are many installation variations, the cabling between the amplifier and control unit is not provided as standard. Contact e2v technologies for details of interface cable accessories.

For details of cable termination instructions including cable type etc., see section 7.

4 Operation of the Control Unit

The N6081 is used to control an amplifier from the following product series:

N61xx	(e.g. N6132D, N6150D)
N63xx	(e.g. N6312, N6318D)
N64xx	(e.g. N6440)

4.1 Applying The Voltage Supply

The N6081 requires no external power supply as it is powered by the amplifier via a dedicated line within the control cabling.

Before connecting the control cabling, the operator must be satisfied that:

- Safety requirements are complied with (see the safety notes at the front of this manual)
- The amplifier is off.

Connect the control cabling from the amplifier to the 15-way D-type socket on the back of the N6081 and, if it is safe to do so, apply power to the amplifier.

4.2 The Amplifier Search Process

As soon as power is supplied to the amplifier and the control cabling is connected, the N6081 will initiate the amplifier search process. This will be apparent as the following message will be momentarily displayed on the N6081 display (if the HPA is found quickly, this message may not be seen):

```
Search
```

The N6081 will now search through the 64 available addresses at a Baud rate of 9600 until communication is established. This process will continue until an amplifier is found. When an amplifier is found, a message will appear on the display, similar to the following:

```
Found
HPA @ 40H
```

This message indicates that communication has been established with the amplifier whose address is 40H. This message will be displayed for 2 seconds. It should be noted that if at any time communication is lost with the amplifier, this process will be repeated.

The amplifier fan will be rotating at low speed and the controller "OFF" LED will be lit.

The display will then show the following:

Pwr

4.3 Warm-up

Press the STBY or XMIT key whilst in the "OFF" state to begin the TWT cathode warm-up process (180 seconds). In this state power is only applied to the TWT cathode heater.

"OFF" LED will have gone out.

WARM-UP LED will be lit.

Display remains unchanged.

4.4 Standby

If the STBY key had been pressed, from the "OFF" state, then after 180 seconds the STBY LED will light and the WARM-UP led will go out.

Display remains unchanged.

If there are no faults, the amplifier is now ready to go to the transmit state.

4.5 Transmit

If the XMIT key had been pressed, from the "OFF" state, then after 180 seconds the XMIT LED will light and the WARM-UP LED will go out.

The amplifier will operate.

Amplifier fan will rotate at full speed.

Display will now show the output power in watts.

Pwr 150 W

If the XMIT key had been pressed, from the STBY state, then the amplifier will operate immediately.

4.6 Off

Press the "OFF" key and the Amplifier will return to the off mode. The display will then show the following:

Pwr

The Amplifier cooling fans will continue to rotate at full speed for 120 seconds for TWT cool-down. After the 120 seconds the fans will slow to idle speed.

IT IS RECOMMENDED THAT THE POWER TO THE AMPLIFIER IS NOT REMOVED BEFORE THE COOL-DOWN HAS BEEN COMPLETED.

4.7 Fault

If at any time a summary fault occurs, the fault indicator will be lit and the amplifier will leave the "transmit" state.

5 Measurement and Monitor Functions

5.1 Power (watts)

Once the N6081 has found an amplifier, its display will show the amplifier's forward power in watts.

5.2 Power (dBW)

This feature can be selected by pressing the function select key once. This will display the amplifier's forward power in dBW (decibel watts). The reading is only valid if the forward power is greater than 0 W, otherwise the reading will be blanked.

5.3 Helix Current

This feature can be selected by pressing the function select button once more. This will display the helix current of the TWT in mA.

Note: These functions are only available whilst the amplifier is in 'Transmit' state.

6 Gain Setting (Only available on the N6081D)

The Amplifier must be fitted with a digital attenuator (DEVA) for this facility.

6.1 Set Gain (result in watts)

This feature can be selected by pressing the function select button once more. This will allow the digital attenuator to be set on the amplifier. This is achieved by turning the gain select knob on the front of the N6081D, which will result in a change of forward power from the amplifier, which will be displayed on the screen in watts.

Ensure the gain knob is fully anti-clockwise for lowest power setting

6.2 Set Gain (result in dBW)

This feature can be selected by pressing the function select button once more. This is in essence the same feature as above but the amplifier's forward power is displayed in dBW. Pressing the function select button again will result in the display returning to 'Power (watts)' setting and further presses will scroll through the functions as described.

Ensure the gain knob is fully anti-clockwise for lowest power setting

Note: These functions are only available whilst the amplifier is in 'Transmit' state.

7 Amplifier Interface

7.1 Introduction

Connection to the Stellar Amplifier is made via a 15-way D-type socket for the N6081X series or a 26-way D-type plug for the N6081X-01 series.

The control unit obtains its power supply (15 V, 100 mA) from the Stellar amplifier via this D-type connection. The D-type back shell and control connector back shell must have a 360° electrical connection to the cable screen to prevent Radio Frequency Interference (RFI) from adversely affecting the operation of the product.

A screened multicore cable must be used for the interconnection.

To avoid the risk of crosstalk on the "data communications" lines, they must be twisted pairs.

The N6081X-01 series also has a 9-way D-type socket to enable connection to the RF INHIBIT and INV RF INHIBIT lines.

7.2 Interconnections (see also Appendix A)

41-way amplifier connector	15-way D-type connector
A	2
B	4
C	3
D	5
E	6
H, P, R, p	14
J	7
K	8
L	9
U	1
b	10
c	11
d	13
e	12

Notes: Cable for b and c must be a twisted pair. Cable for d and e must also be a twisted pair.

7.3 Interconnections for -01 variant (see also Appendix B)

41-way amplifier connector	26-way high density D-type socket
A	8
B	6
C	7
D	5
E	4
G	10
H	1
J	19
K	2
L	25
P, R, p	20
U	9
b	24
c	23
d	21
e	22

Notes: Cable for b and c must be a twisted pair. Cable for d and e must also be a twisted pair.

9-way connector	function
1	INV RF INHIBIT
2	not used
3	not used
4	not used
5	0 V
6	RF INHIBIT
7	not used
8	not used
9	not used

Note: To enable RF, link pins 1 and 5.

7.4 Termination Resistors

A 120 Ω ¼ W resistor is to be fitted in the D-type back shell between pins 12 and 13 (pins 21 and 22 for the -01 variant).

A 120 Ω ¼ W resistor is to be fitted in the 41-way connector back shell between pins b and c and another 120 Ω ¼ W resistor between d and e.

8 Fault Finding

If the control unit does not work correctly, consult the following table before contacting either the Stellar 24-hour Hotline (see ‘Customer Care’, page 3) or your distributor for further assistance.

Consult the relevant amplifier operations manual for descriptions of amplifier fault messages given on the front panel displays.

Fault experienced	Possible cause
No communication with the amplifier	Interconnecting cable damaged or unconnected
	Amplifier not powered

9 Specification

9.1 Electrical

Prime power:

voltage . . . . . 15 V

current . . . . . 100 mA

9.2 Mechanical

Dimensions (19-inch rack):

width . . . . . 483 mm (19 inches)

height . . . . . 1U, 44 mm (1.73 inches)

depth . . . . . 50 mm (2 inches)

depth with allowance for connectors and bend radius of cable . . 150 mm (6 inches)

Weight (nominal) . . . . . 0.5 kg (1.1 pounds)

9.3 Environmental

For operation outside these parameters, refer to e2v technologies for guidance.

Operating temperature . . . . . 0 to +50 °C

Storage temperature . . . . . −40 to +70 °C

Vibration . . . . MIL-STD-810E; common carrier and field transportation

Shock . . . . . IEC Publication 68-2-27 Part 2 Test Ea 25 g for 11 ms, half-sine

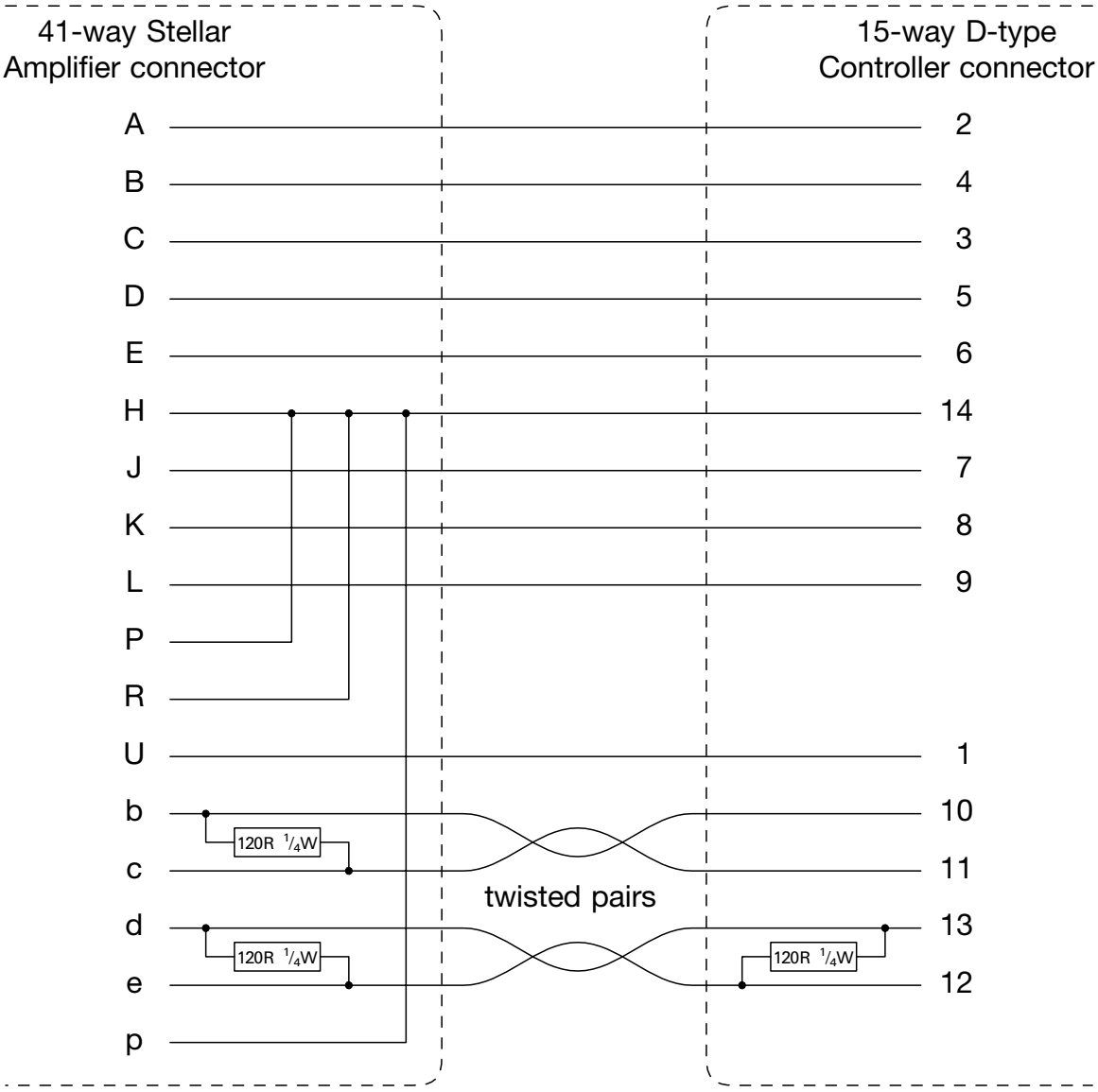
Electromagnetic compatibility . . . EMC Directive 89/336/EEC

Safety . . . . . Low Voltage Directive 73/23/EEC BS EN 60950

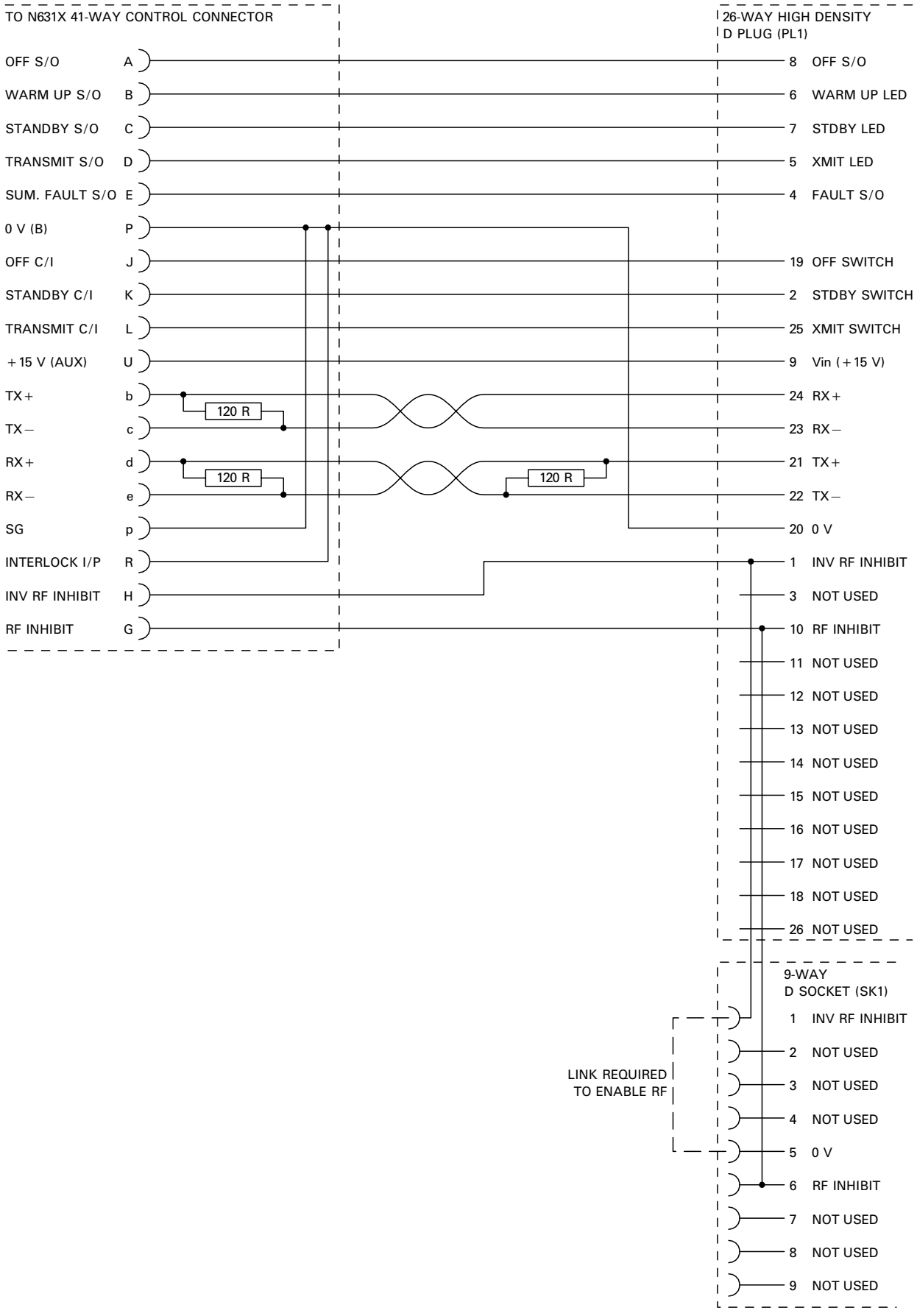
10 Related Document

- Data Sheet (A1A-N6081 series).

Appendix A


41-way Stellar
Amplifier connector
15-way D-type
Controller connector
A
B
C
D
E
H
J
K
L
P
R
U
b
c
d
e
p
2
4
3
5
6
14
7
8
9
1
10
11
13
12
120R 1/4W
120R 1/4W
120R 1/4W
twisted pairs

Appendix B


TO N631X 41-WAY CONTROL CONNECTOR
OFF S/O A
WARM UP S/O B
STANDBY S/O C
TRANSMIT S/O D
SUM. FAULT S/O E
0 V (B) P
OFF C/I J
STANDBY C/I K
TRANSMIT C/I L
+15 V (AUX) U
TX+ b
TX– c
RX+ d
RX– e
SG p
INTERLOCK I/P R
INV RF INHIBIT H
RF INHIBIT G
120 R
120 R
120 R
26-WAY HIGH DENSITY
D PLUG (PL1)
8 OFF S/O
6 WARM UP LED
7 STDBY LED
5 XMIT LED
4 FAULT S/O
19 OFF SWITCH
2 STDBY SWITCH
25 XMIT SWITCH
9 Vin (+15 V)
24 RX+
23 RX–
21 TX+
22 TX–
20 0 V
1 INV RF INHIBIT
3 NOT USED
10 RF INHIBIT
11 NOT USED
12 NOT USED
13 NOT USED
14 NOT USED
15 NOT USED
16 NOT USED
17 NOT USED
18 NOT USED
26 NOT USED
9-WAY
D SOCKET (SK1)
1 INV RF INHIBIT
2 NOT USED
3 NOT USED
4 NOT USED
5 0 V
6 RF INHIBIT
7 NOT USED
8 NOT USED
9 NOT USED
LINK REQUIRED
TO ENABLE RF

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106 Waterhouse Lane, Chelmsford,
Essex CM1 2QU, UK.
Tel. or Fax: +44 (0) 1245 355398

STELLAR HOTLINE FAULT REPORT FORM

Date:		Call Time:	Tel. No.:
Name:			Fax No.:
Organisation:			
Location:			
Country:			
Product Type:			Serial No.:
Category:	☐ A. 1 Hour	☐ B. Next Day	☐ C. Next Working Day

Nature Of Problem Or Request (Check appropriate boxes or refer to topic numbers):

☐ Unit Is Defective:

1 ☐ Fuse has blown
2 ☐ Circuit breaker trips
3 ☐ No fans operating
4 ☐ No display
5 ☐ No indicators
6 ☐ No cathode warm-up
7 ☐ No standby mode
8 ☐ No transmit mode
9 ☐ No output power
10 ☐ Other (see comments)

☐ Unit Is Malfunctioning:

11 ☐ Low output power
12 ☐ High input power
13 ☐ High reflected power
14 ☐ High helix current
15 ☐ Unit trips
16 ☐ Unit trips repeatedly
17 ☐ Unit trips and shuts down
18 ☐ Other (see comments)

19 ☐ Bad airflow
20 ☐ Helix overcurrent
21 ☐ Excess reflected power
22 ☐ PSU overcurrent
23 ☐ PSU too hot
24 ☐ RF load too hot
25 ☐ LV PSU fault
26 ☐ Bad HV rail

☐ Difficulties With Control Panel Or Remote Interface:

27 ☐ Set-up
28 ☐ Helix current meter
29 ☐ Power meters
30 ☐ Low power alarm
31 ☐ Hour counters
32 ☐ IEEE488 / RS422 / RS485
33 ☐ User port
34 ☐ Other (see comments)

☐ Applications Enquiries:

35 ☐ Prime power
36 ☐ Front panel operation
37 ☐ Cooling / ducting
38 ☐ RF input circuit
39 ☐ RF output circuit
40 ☐ Other (see comments)

Commercial Enquiries:

41 ☐ Data sheets
42 ☐ Applications sheets
43 ☐ Sales contact
44 ☐ Other (see comments)

For E2V Technologies use only	
CAT:	
ENG:	
TIME:	
SIG:	
DR No:	

Comments And Observations:

Please complete this form prior to using the E2V Technologies 'STELLAR HOTLINE'; it will help us respond promptly to your request. Be aware that telephone conversations may be recorded.
The completed form may also be faxed or mailed to the address above and should be sent with any unit returned to E2V Technologies for repair.

e2v technologies

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