

Rev.Date 2003-02-11	Rev. A	Document ID 1522-QUAZ 911 932
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Technical Specification NERA F77		

Specifications subject to changes without notice

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1. GENERAL

The Nera F77 equipment is Inmarsat approved with Certificate Number 66EB01.

The equipment is design with priority to achieve high Reliability, Maintainability and Simplicity.

2. LIST OF MATERIEL

- Above Deck Unit (ADE) inc. Antenna /RF / GPS parts and Radome
- Main Communication Unit (MCU)
- ISDN Telephone (ISDN HS)
- Distress Alarm Box (DA Box)
- Documentation

3. STANDARD FUNCTIONS:

Duplex Voice 4800 kbps (mini-M Voice quality)
56/64 kbps ISDN (ISDN voice, G3 and G4 Telefax or Data)
MPDS Packet Data Service
Distress Alarm
L-band output (1,5GHz) signal output for Broadcast services
Storing the 10 latest number dialed (up to 20 digits)
Telephone book for 99 short numbers with alphanumeric names
Restricted Dialing
Traffic Logging and Access Code
Charge Tone and Restricted SIM
Save and Restore Configuration
MMI interface (VtLite Marine)
Message Indicator

3.1 Optional Functions and services

“Radio Silence” function
Small size radome (Flush Assembly Radome)

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4. OVERALL SIZE AND WEIGHT

Size	:	ADE	Mast Radome (H) 1072 x (D) 1312 (mm) (Flush Radome (H) 1062 x (D) 925mm)
		MCU	(H) 380 x 372,5 (W) x 70(D) (mm)
		ISDN Handset	(H) 215 x 56 (W) x 45 (D) (mm)
		Distress Box	(H) 90 x 228 (W) x 35 (D) (mm)
Weight	:	ADE	72 kg (Mast Radome), 42kg (Flush Radome)
		MCU	7,4 kg
		ISDN Handset	0,3 kg
		Distress Box	0,23 kg

5. ISDN HANDSET (HANDSET W/DISPLAY)

RJ-45connector w/approx. 0,5 m spiral cable

LCD display with 30 alphanumeric characters and 8 symbols / indicators

12 pcs Number keys

12 pcs Functional keys allowing short number dialling, last calls etc., and basic equipment controls and monitoring such as : Selection of satellite & LES, basic MMI readout etc.

Multi language display

6. CONNECTIONS (ADE)

6.1 Antenna Coaxial Connector

The ADE is provided with 1 pc N-contact (female) for connection to the MCU.

This contact is feeding DC supply (48VDC), RF signals and a number of inter-communication signals between the MCU and ADE

7. CONNECTIONS (MCU)

7.1 Coaxial Connectors

7.1.1 ADE – MCU connection

- The MCU is provided with 1 pc N-contact (female) for connection to the ADE. This contact is feeding DC supply (48VDC), RF signals and a number of RF inter-communication signals between the MCU and ADE

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7.1.2 L-band output

The MCU is supplied with a TNC contact providing 1,5 GHz output for services such as:

- Differential GPS correction
- Chart corrections
- Audio broadcast

7.2 Connectors (contacts)

- 4 pcs RJ-45 (ISDN) connectors for Distress Alarm Box, ISDN Telephones, PC, G3/G4 Telefax etc.
- 2 pcs RJ-45 connectors (TEL 3 and TEL 4) for Analogue telephones / telefax
- 1 pc USB connector for PC / data equipment
- 1 pc 9-pin D-SUB connector for RS-232 interface
- 1 pc 9-pin D-SUB connector for RS-232 or RS-422 interface

7.3 Terminals (for wire screw connections)

- 4 pcs each with 4-terminals for 2 x 2pair ISDN connection
- 4 pcs each with 2-terminals for connection to 2-wire analogue telephones (TEL1 + TEL2 + TEL3 + TEL4)
- 4 pcs terminals for RS-422 connection
- 4 pcs terminals for "Radio Silence" connection
- 2 pcs terminals for NMEA connection

7.4 Power connectors

- 1 pc AC Mains (100 – 240 VAC) input connector

7.5 SIM Card

The MCU is provided with SIM Card reader.

8. ELECTRICAL INTERFACE

8.1 ISDN connection

The ISDN connection enabling termination of up to 10 ISDN circuits for following services :

- 4.8 kbps compressed speech (Mini-M voice)
- 64 kbps speech
- Audio 3.1 kHz (G3)Telefax
- 64 kbps Telefax Service (UDI-G4)
- 64 kbps Data Service (UDI)
- 56 kbps Data service (V110)
- 64 kbps Audio service (3,1kHz)
- MPDS

Maximum cable length with 0,5mm² : 100m
Maximum ISDN output power : 10W

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8.2 2-wire Analogue Telephone/Telefax (connectors / terminals)

Line Impedance	:	820 ohm
Maximum line loop resistance	:	500 ohm (typical >1km)
Return loss	:	>14dB
Dialing function	:	Standard DTMF phone, cordless base station, PABX (Trunk lines) or fax machine
Dial tone	:	440 Hz -19 dBm
DTMF minimum	:	Dialing: -20dBm0
Speech level	:	+2.5 dBm
Receive level	:	-9 dBm
Line voltage	:	40V DC
Max line current	:	30mA
MES generated audible levels	:	-10 dBm0 +/-5dB
Ringing Tone	:	425 Hz +/-1Hz
Available Tone	:	800 Hz +/-1Hz
Ringing signal	:	150vpp 25Hz (Max two telephones/faxes)
Hook ON / Hook OFF	:	Hook off: >20mA/Hook on: < 9mA

8.3 RS-232 / RS-422 Data interface

Data Protocol	:	Hayes AT compatible
Bit rate	:	2.4 – 115,2 kb/s
Parity	:	Odd/even/mark/space
Data Bits	:	7 or 8 bit
Stop bit	:	1 or 2 stop bits
Flow control	:	XON/XOFF

<u>RS-232</u>		
Maximum cable length with 0,5mm ²	:	3m
<u>RS-422</u>		
Maximum cable length with 0,5mm ²	:	100m

8.4 Radio Silence Interface

The MCU is provided with:

- Two (2) screw terminations for connection to a “Silence Mode” switch which will inhibit RF radiation from the ADE.
- Two (2) screw terminals for verification of “Silence mode” status.

8.5 NMEA Interface

The MCU is provided with two (2) screw termination for NMEA Heading input

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9. ANTENNA SEPARATION (MCU –ANTENNA)

Requirement for an optional cables :

Maximum loss -23dB at 1.6 GHz, 12,0 ohm DC:

<u>Cable Type</u>	<u>Max Length</u>	<u>Note</u>
RG 223	30 m	
RG 214-FRNC	60 m	
S 10172 B-11	170 m	
RF 1/2" 50	210 m x	
RF 7/8" 50	380 m x	

(x) Coaxial Cable where a Pig-tail is required in each end.

10. TECHNICAL PARAMETERS

10.1 Power Input

10.1.1 AC Mains Input

110 V or 230V +/- 10 % (90VAC to 264 VAC), 47-63 Hz

10.1.2 Power consumption

During Receive / Idle mode	:	Approx. 40 W (minimum power)
Transmit (Global Beam communication)	:	Approx. 150 W (maximum power)

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10.2 RF Parameters

10.2.1 G/T, EIRP

G/T	:	- 4 dBK
EIRP	:	Maximum +32 dBW Minimum +5 dBW.

10.2.2 Antenna

Antenna Gain	:	21 dBi
Beam with (at 3dB)	:	5°
Size	:	Flat Antenna (32 patches)

10.2.3 Frequency

Type of operation 4.8 kbps and 64 kbps	:	Single Channel Per Carrier (SCPC)
Type of operaton MPDS	:	TDM / TDMA (Fw – Rtn)
Transmitting	:	1626.5 to 1660.5 MHz
Receive	:	1525.0 to 1559.0 MHz
Channel space 4.8 kbps SCPC	:	5 kHz
Channel Spacing 64 kbps SCPC	:	40 kHz
Channel Spacing MPDS	:	40 kHz (8 time slots)

10.2.4 Modulation / polarization

Modulation (signaling)	:	BPSK
Modulation during 4k8 operation	:	0-QPSK
Modulation during ISDN operation	:	16QAM
Modulation during IPDS operation	:	16QAM
Polarization	:	Right Hand Circular Polarization

10.2.5 Electromagnetic Compatibility

Radiation	:	EN55022 (August 1994) EN 60945 (Clause 9), January 1997
Conducted	:	EN 60945 (Clause 10) January 1997 EN 50082-2, August 1996
LVD	:	EN 60945(2000)

10.3 Safety distances

Magnet Compass safe distance	:	1 m from the steering compass (x) (x) British or Norwegian vessels
Microwave Radiation	:	Passengers should not be admitted in areas closer than 5 m (Based on 8W/m ²)

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11. ENVIRONMENTAL PARAMETERS

“Wheel-Mark” approval

Nera F77 Antenna Pedestal complies to “Wheel-mark” requirement (IEC 60945)

Protection

Above Deck Unit : IP66
MCU & Handset : IP22.

Storage temperature : -30°C - +70°C

Operational temperature

MCU : -25°C - +55°C, 40°C 95 % humidity (non-condensing)

Above Deck Unit : -25°C - +55°C, 40°C 95% humidity, (non-condensing)

Infrared: : 500 W/m²,
Ultra violet: : 54 W/m²,
Visible: : 1150 W/m²
Wind : Relative average wind velocity up to maximum 180 km/h
Rain : 100 L/min
Ice : Up to 25 mm

Robustness Survival :

Vibration : EN 60945

Ships motion

Roll : +/- 25 °
Pitch : +/- 15 °
Yaw : +/- 8 °
Turning Rate : 12,5 ° per seconds