

#### Marinex 3D



### Installation Guide

#### Regulatory information Marinex 3D

The Marinex 3D Digital Telephone Exchange (MNX3D) has been designed to meet British Telecom standards.

The MNX3D is designed for use on-board ships. It may not comply with specific statutory local PTT requirements for use in some countries.

#### Maintenance

Maintenance of the MNX3D must only be performed by Marine Communications Limited or its authorised agent. The user may not make any changes and/or repairs except as specifically noted in this manual. Unauthorised alterations or repairs may affect the approval status of the system and void any remaining warranty.

There are no serviceable components in the exchange. Board replacement is the only method of service. Faulty boards to be returned to Marine Communications Limited or its authorised agent.

#### **Radiated Emissions**

The MNX3D complies with the current rules regarding radiation and radio frequency emission as defined by the European EMC CE marking.

#### This equipment generates and uses R.F. energy and if not installed and used in accordance with the instruction manual may cause interference.

#### **Telephone Compatibility**

Marine Communications Limited Marinex 3D Digital Telephone Exchange has been designed to work with most telephone instruments worldwide. However satisfactory performance cannot be guaranteed for every allowable combination of host and subsidiary apparatus.

Only telephones which use DTMF signalling can be used. It will not work with Loop Disconnect (LD) or pulse telephones.

All telephones over 15 years old should be replaced with modern telephones.

Version	Date	Notes
1	06/2006	First Issue
2	01/2007	Added more detail for testing systems
3	09/2007	Added rack mounting details
4	11/2007	Added space required around cased version
5	12/2007	Change PSU to F6020 dual voltage unit
6	05/2009	Corrected space requirements for cased version

#### **Document History**

#### **Marine Communications Limited**

59, Bownham Park, Rodborough Common, Stroud, Glos., GL5 5BZ United Kingdom

Tel:	+44 (0)1453 873399
Fax:	+44 (0)1453 873399
email:	support@marinex.co.uk
web:	www.marinex.co.uk

#### **General Information**



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The MNX3D Telephone Exchange is a fully digital telephone system designed to meet the current and planned future requirements of all internal and external telephone calls made on-board ship.

The MNX3D system incorporates state of the art digital technology for command processing and voice switching, using Pulse Code Modulation/ Time Division Multiplexing (PCM/TDM) distributed switching matrix.

The MNX3D achieves a high level of flexibility by:

- Using a standard 3U (265mm) high 19 inch rack  $\geq$
- $\geq$ Plug in printed circuit boards to support different types of interfaces and instruments
- $\triangleright$ No limit on speech paths (non-blocking) giving communication at all times

MNX3D is available in a bulkhead mounting cabinet, with a built-in distribution frame, or as units to be mounted in a customer rack

The system architecture has been designed to allow a high level of software control over the system's hardware. The software has a large range of features and capabilities including Call diversions and pickups, voice prompting etc

All of the features can be controlled at extension, group and user levels.

MNX3D Exchange has extra features for the marine environment including:

- External shore line, SATCOM, cellular and Public Address access  $\triangleright$
- $\geq$ AC operation with Uninterruptible Power Supply (UPS) backup option
- $\triangleright$ **Priority intrusion**
- Direct dial in and out with voice prompting (DISA)  $\geq$
- Voice prompting for features  $\geq$
- Modular construction  $\geq$
- Built-in Main Distribution Frame if required  $\geq$

MNX3D in a 3U rack supports up to 112 extensions for internal telephones, 7 external connections and 1 Public Address interfaces.

The bulkhead mounting cabinet meets Lloyds Register of Shipping, VDE, Det Norske Veritas, UL, CSA, TUV and Russian Maritime Register of Shipping approvals.

The exchange configuration (database) is held in an internal solid state hard disk. The facilities within the exchange can be changed to suit individual requirements using a Windows<sup>TM</sup> computer. Programming is via USB on the front of the processor board. Configuration and log files can also be transferred to and from a PC using a small MMC card.

The exchange is requires an AC (90-260Vac) power supply.

Every telephone and tie line can be individually configured to meet customer's specific requirements. Using a telephone equipped for Calling Line Indication (CLI) the caller's telephone number can be displayed on the receiver's telephone unit.

The exchange is pre-programmed to provide specific features for 3 classes of extensions.

When connected to external lines, incoming calls are directed to a pre-specified extension. Outgoing calls are enabled for Class A phones and can be dialled directly by prefixing the telephone number with a specific code.

#### **General Information**

Call-logging facilities are provided by the exchange to enable all internal, outgoing and incoming calls to be logged. The information logged includes the source extension, user name, number dialled and duration of the call. Output is through a Centronics or RS232 serial interface for a printer.

The system uses -48V bias on telephone lines giving superior performance over 24V systems. The volume on telephones can also be set electronically under engineering control to ensure clarity in reception.

By adding or replacing plug-in modules, users can carry out future expansion and servicing of the exchange. To assist with maintenance and fault finding, a number of indicators are provided on the modules to show the status of many areas of the exchange.





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System Components

#### **Bulkhead Cabinet**

MNX3D can be supplied either in a bulkhead mounting cabinet or as 19" sub-racks for mounting in customer supplied frames.

The bulkhead cabinet has three parts. The base box is mounted on the bulkhead and contains the built-in distribution frame. The section has removable gland plates on the top and bottom, which can be drilled away from the equipment for cable access.

The hinged centre section contains the electronics' sub-rack. This can be swung open to allow free access to the base box. The electronics' sub-rack is described below.

The final part is the front door made from aluminium extrusion with die-cast corners and 4mm safety glass. The door frame conceals the fastener of the centre section to the base box.

The same key opens the front and centre sections. The all-round knife edge guarantees an excellent seal (protection category IP55 to EN 60 529/10.91)

The bulkhead cabinet meets Lloyds Register of Shipping, VDE Det Norkse Veritas, UL, CSA, TUV and Russian Maritime Register of Shipping approvals.

#### **Electronics Sub-Rack**

The electronics sub-rack contains a motherboard with 50-way ribbon cable connectors for

connection to the MDFs on one side and connectors on the other for connection to the plug in PCBs.

There are 15 slots in each 3U sub-rack for the line cards (D7030/D7050). The right most



area is for the power supply. The remaining slot is for the processor card (D7029).

On the rear there are five connectors for connecting the power and optional VGA video, keyboard/mouse, Ethernet, parallel printer and serial printer ports. The power lead socket is supplied with the exchange.

Adequate ventilation must be provided in customer installed rack mount systems. MCL recommend that 2 1U vents are provided above and below the rack.

#### Power Supply Unit (F6020)

The power supply unit converts the AC (90-264V @ 50/60Hz) and DC 24V (±20%) to the system DC voltage. LEDs on the PSU power switch indicates valid inputs.

There is one 5V DC output.

Due to the EMC filters on the input to the power supply, the contacts will remain live for 5 minutes after the unit is disconnected.





#### Processor Card (D7029)

The Processor Card incorporates the system's RAM, solid-state hard disk, master clock, two RS-232C ports, and watchdog circuitry as well as the system PCM voice processing and main microprocessor. The microprocessor is a 32bit high speed CPU which receives and transmits signalling information from/to the other PCBs, controls feature activation and PCM time-slot interchange.

The processor contains 16MB of DRAM and 16MB of solid-state hard disk, which contains the configuration and operating software.

The processor card has the capability to have an optional module added. The Video module allows an external VGA monitor and keyboard to be attached to allow programming and system fault finding.

The Processor card also provides announcements for voice prompting and user greetings. The standard 64KBps PCM signals are stored for high quality voice reproduction. Voice Prompting is normally in English, but can be updated by the user to any language or message.



On the front of the card are two connectors for the MMC card and USB connection to a PC or laptop.

#### Analogue Extension Card (D7030)

The Analogue Extension Card has 8 single line analogue (POTS) telephone ports. The card provides the appropriate A/D and D/A conversions, on/ off-hook detection and ring generation. For each extension there is a bi-coloured LED, which shows the status of the line (on/off-hook, ringing, and status), this allows easy diagnostics of problems. Also 2 x RJ45 jack sockets on the front of the card allow access to the individual lines for testing.

A telephone can be connected up to 3000 metres from the system using 0.34mm<sup>2</sup> (22AWG) wire.

The card provides each extension with approximately -48V line bias and 70V 25Hz ringing. The loop current is approximately 24mA.

With suitably equipped telephones, an extension can have a message waiting light illuminated using line reversal, or display caller information.

The line interface modules are plugged into the extension card so that they can be replaced easily if damaged, for example by lightining.



#### Analogue External Line Card (D7050)

The Analogue External Line Card has 8 positions which can contain one of the following modules: AG2120 COIC Module, M10 Public Address Module, or M90 Signal Relay Module.

The card provides the appropriate A/D and D/A conversions and signal processing. For each position there is a bi-coloured LED, which shows the status of the line, which allows easy diagnostics of problems. Also 2 x RJ45 jack sockets on the front of the card allows access to the individual lines for testing.

The standard card is supplied with 6 x AG2120 modules, 1 x M90 Signal Relay module and 1 x M10 Public Address module.

#### AG2120 COIC Module

The AG2120 module provides PABX Loop Start lines with circuitry for ring and loop current detection, A/D and D/A conversions, and pulse and flash signalling. The bi-colour LED show the incoming call status (on/ off-hook, detected ringing cadence, and problems).

#### M10 Public Address Module

The M10 Public Address Module provides a Public Address output with a voltage free (24VDC 1Amp max) relay switch. The "microphone" output is at approximately 0dBm (line-level). The LED to show the status of the PA relay.

#### M90 Signal Relay Module

M90 Signal Relay module providing 2 low voltage (24VDC 1Amp max) normally open relays for problem reporting. The LED shows the status of the relays. The operation of the relays is set in the configurAID software.











#### **General Site Considerations**

The first step is to locate an acceptable site for the equipment. When locating the mounting site, the following points should be considered:

- MNX3D is designed for bulkhead mounting. The system must be firmly mounted to the bulkhead to reduce the effect of vibration
- The location must have access to a dedicated 93-264 AC 50/60Hz circuit with a circuit breaker or fuse rated at 5Amps
- > The location must have access to a good earth ground
- The location should be well ventilated with a recommended temperature of 15°C to 25°C and a relative humidity of 5% 90% non-condensing. The area should be suitable for office type equipment
- The equipment should be away from radio transmitting equipment, generators and other equipment capable of generating electrical equipment. The system should be protected from flooding and heavy machinery as well as excessive dust and vibration
- > The location should have adequate accessibility, space and lighting for future servicing
- Telephone cables should be terminated in the integral Main Distribution Frame (MDF) or to an external unit located within 3 metres of the telephone exchange

#### Check on-site Equipment

Once the equipment installation location has been identified and its suitability checked, verify that all the equipment required is onboard and has not been damaged during shipment.

Unpack the Marinex 3D, checking that there is no damage. Check that the type and quantity of boards received is correct and any optional equipment is available. A packing list is included with all systems. Note that the individual boards should not be unpacked at this time.

#### If any equipment is missing or damaged, notify Marine Communications Limited or your agent to correct the situation.

#### Rack Based Systems

The Marinex 3D Exchange can consist of either one or more 19" rack mounted frames holding the component boards and power supplies all enclosed in an outer case or as individual 19" rack mounted frames.

Where the system is part of a larger system such as entertainment centre then this will be rack mounted as per the total system supplier's instructions. Terminations for power and telephones may be different than for the standard cased system.

#### **PCB** Installation

#### Boards must not be installed or removed with applied power

The system PCBs contain digital circuitry, which while extremely reliable, can be damaged by exposure to excessive static electricity. When handling PCBs, a grounded wrist strap should be used to protect the cards from static discharges. Also, use common sense when handling the PCBs. For example, do not place a PCB in positions where heavy objects might fall on the PCB and damage components.



#### System Installation Cased Version

#### Mounting the Case

The cabinet is designed for bulkhead mounting. The mounting positions are as shown below. Bolts of M8 size should be used for fixing the supplied mounting brackets.

Once the unit has been mounted, remove the top/bottom gland plate(s) and cut gland holes in the appropriate position. The cables can then be connected to the in-built MDF mounted in the rear of the case.

It is also recommended that the middle section of the cabinet is supported on a shelf or U frame when in the closed position. It will reduce vibration noise from the cabinet.

All cables should be securely fastened to prevent damage due to vibrations.

#### **Power Wiring**

Power is connected to the exchange through an IEC power connector The supplied line socket must be used as this fits the retaining clamp.

#### Ground (Earthing) Point

The ground (earth) is connected through the power connector. If extra grounding points are required, there are copper M8 studs distributed through out the cabinet. They are protected with pastic covers.

#### **Extension Wiring**

Connection to the ship's telephones is via the built in MDF. See the section on "System Wiring" for more details.







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Space required for Marinex 3D Cased version.

#### All dimensions are in mm.



#### System Installation Rack Version



#### Mounting the Rack

The Marinex 3D is designed to be mounted in a standard 19" rack system. The module is 3U high, and 300mm deep. The unit must be placed on runners to allow easy access and to support the unit along the full depth.

#### Cooling

The Marinex 3D requires fans to be mounted above the unit to provide cooling to the extension boards. Fans with a minimum of 3600 l/min airflow are recommended. One fan should be provided for every 5 boards.

There are three 12V outputs provided on the back of the exchange to power the fans. The centre is +12V and the outside 0V. The maximum current allowed is 0.75A across all 3 sockets.



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Recommended Vent Space (1U)

#### Power Wiring

90-260VAC Power is connected to the exchange through an IEC power connector The supplied line socket must be used as this fits the retaining clamp.

#### Ground (Earthing) Point

The ground (earth) is connected through the power connector. If extra grounding points are required, there is an M4 stud on the rear of the unit.

#### **Extension Wiring**

Connection to the ship's telephones and external lines is via 50 way headers on the backplane. The headers are designed for flat ribbon cables.

The headers are behind the large panel on the back. The panel is secured with either No 8 Torx screws or cross-head screws. The gap at the end is for the ribbon cables to exit the exchange.

The recommended IDC sockets are Tyco 1-1437025-6, Harting 0918550681508, or equivalent.

Each header carries  $1\frac{1}{2}$  boards. i.e. the first header is for Board 1 extensions 1 - 8 and Board 2 extensions 1-4, the second header has Board 2 extensions 5-8 and Board 3 extensions 1 - 8.

The pinout for the headers are on the next page.

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Pins	Header 1	Header 2	Header 3	Header 4	Header 5	Header 6	Header 7	Header 8	Header 9	Header 10
1,2	B1 E1	B2 E5	B4 E1	B5 E5	B7 E1	B8 E5	B10 E1	B11 E5	B13 E1	B14 E5
3,4	I	I	I	-	I	I	I	I	I	I
9,5	B1 E2	B2 E6	B4 E2	B5 E6	B7 E2	B8 E6	B10 E2	B11 E6	B13 E2	B14 E6
8'L	I	I	I	ı	I	I	ı	I	I	ı
9,10	B1 E3	B2 E7	B4 E3	B5 E7	B7 E3	B8 E7	B10 E3	B11 E7	B13 E3	B14 E7
11,12	ı	·	ı		·	ı		ı	ı	1
13,14	B1 E4	B2 E8	B4 E4	B5 E8	B7 E4	B8 E8	B10 E4	B11 E8	B13 E4	B14 E8
15,16	I	I	I	-	I	I	I	I	I	I
17,18	B1 E5	B3 E1	B4 E5	B6 E1	B7 E5	B9 E1	B10 E5	B12 E1	B13 E5	B15 E1
19,20	1	-	-	-	-	-	1	I	I	ı
21,22	B1 E6	B3 E2	B4 E6	B6 E2	B7 E6	B9 E2	B10 E6	B12 E2	B13 E6	B15 E2
23,24	-	-	-	-	-	-	-	-	ı	1
25,26	B1 E7	B3 E3	B4 E7	B6 E3	B7 E7	B9 E3	B10 E7	B12 E3	B13 E7	B15 E3
27,28	-	-	-	-	-	-	-	I	I	1
29,30	B1 E8	B3 E4	B4 E8	B6 E4	B7 E8	B9 E4	B10 E8	B12 E4	B13 E8	B15 E4
31,32	-	-		-	-	-		ı		1
33,34	B2 E1	B3 E5	B5 E1	B6 E5	B8 E1	B9 E5	B11 E1	B12 E5	B14 E1	B15 E5
35,36	-	-		-	-	-		ı		•
37,38	B2 E2	B3 E6	B5 E2	B6 E6	B8 E2	B9 E6	B11 E2	B12 E6	B14 E2	B15 E6
39,40	-	-		-	-	-		ı		•
41,42	B2 E3	B3 E7	B5 E3	B6 E7	B8 E3	B9 E7	B11 E3	B12 E7	B14 E3	B15 E7 (Relay 1)
43,44	-	1	1	•	1	ı	'	ı	,	(Relay 2)
45,46	B2 E4	B3 E8	B5 E4	B6 E8	B8 E4	B9 E8	B11 E4	B12 E8	B14 E4	B15 E8 (mic)
47,48	-	-	1	-	-	-		I	I	(Switch)
49,50	-	-	-	-	-	-	-	-	ı	1
B = Board	Number; E	= Extensio	on on Boar	ď						
On External	line cards ]	E1 - E6 are	COIC lines	s, E7 is rela	ay output, E	8 is the Mi	c output for	the Public	Address mo	odule.
				,	er ourpus, r		e output tot	ULO I GUIO	i iddi ebe ilin	

System Installation - Rack Version

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#### Processor Rear Wiring

On the rear of the frame there is a connector panel with sevent sockets and plugs.

Power is connected to the exchange through an IEC power connector The supplied line socket must be used as this fits the retaining clamp.

If a 24V power supply is fitted, then the AC power input is not used. Pin 1 is +24V, Pin 2 not connected and Pin 3 is 0V.

A serial printer can be connected to the Marinex 3D. The wiring for the port is the same as on a Personal Computer. The manual for the printer will give the required wiring and connections. The serial printer is set up as 9600baud, 8-bits and 1 stop bit and CTS/RTS handshaking.



#### Extension and External Wiring

The connection to the ship's wiring is through the internal MDF.

The "screwless" connectors are designed to take up to 2.5mm cables and just require a flat blade screwdriver (blade size 2.5mm x 0.4mm) to capture the wire.

The extensions only use the 'A' and 'B' terminals.

External lines to VSAT, shore lines, GSM, etc only use the 'A' and 'B' terminals.

Public Address switch connect to 'C' and 'D' terminals and the microphone connects to 'A' and 'B'.

The drawing on the next page gives more detail.





Extensions start at Slot 1 and go up External Lines (Ties & PAs) start at slot 15 and go down Wire size for connecting to MDF: 0.34mm<sup>2</sup> to 2.5mm<sup>2</sup>

Extensions connect to the "A" and "B" terminals Tie Lines connect to the "A" and "B" terminals Public Address mike connect to the "A" and "B" terminals Public Address switch connect to the "C" and "D" terminals

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### Commissioning



#### Extension Commissioning

The extensions should be tested before the Marinex 3D is programmed with the customers requirements. If the exchange has been supplied with a customer program, then this must be used instead of the factory configuration tables, when checking the extension numbers and access rights.

#### Ship's Wiring

#### Before power is connected to the Marinex 3D, All short circuits must be found and removed. Only a Digital Multimeter (DMM) to be used for line testing

The resistance reading between the two wires of the extension should be between  $17K\Omega$  and  $30K\Omega$ . The resistance reading between either of the wires and the ship should be greater than  $500K\Omega$ .

#### Line Status

Once all of the wiring has been tested, power can be applied to the Marinex 3D. Each of the extension cards has 8 bi-coloured LEDs for each of the lines and above the test RJ45 connectors a single bi-coloured LED for the board status.

The following colours are used to show the status of the lines or board. The LED will also flash in different patterns to show more information:

	-	
Colour	Flashes	Meaning
Green	on	Line on-hook
Green	Yes	Line ringing (flashes in time with ring cadence)
Green	Fast	Line has an MCL telephone and is being remote controlled
Orange	1	Line has been turned off
Orange	2	Line has been disabled in the configuration
Orange	3	Line has no configuration programmed
Red	1	Line has been left off-hook and not in a call
Red	2	Line has a hardware problem
Red	3	Reserved

#### Line LEDs

#### **Board LED**

Colour	Flashes	Meaning
Green		Reserved
Orange	1	Board not receiving the required information from CPU
Orange	2	Board has been disabled in the configuration
Orange	3	Board has no configuration programmed
Red	1	The board has a hardware problem
Red	2	The board temperature is high
Red	3	The board temperature is too high, all lines have been turned off

#### Startup

On startup, the leds will flash red and green alternatively. As soon as the system has recongised the boards, all the LEDs will go off.

#### Test RJ45 connectors

There are two RJ45 connectors which are connected in parallel to the extension lines. These allow the lines to be tested without having to disconnect the lines. If the line is off-hook, then the test point will appear not to work. A break-out board to individual RJ45's is available from **mcl**.

#### Line Testing

The initial test requires all the telephones to be on-hook so that there are no LEDs lit on the extension boards.

There is two methods of testing an extension. The first method for testing extensions when the system has been commissioned and an extension is not working. The second method is to be used when commissioning the whole system.

#### **Extension Test**

The extension test is for use when the system has been comissioned and an extension stops working or a new extension is added. These tests do not require any special mode on the exchange, however the extension needs the right to use the engineering functions.

#### **Commissioning Mode**

The commissioning mode is designed to help configure a new system, when there might be wiring errors and it is not known if all the extensions have been installed. If a printer is attached, then a report can be generated as each extension is tested if required.

The tests will confirm that the extension is working and has been allocated the correct class of service. All of the prompts are in English. Only one person is required for the tests, however up to five technicians can test telephones simultaneously.

The commissioning mode is activated by entering the one of the following two codes into any telephone:

**# Distributor ID & Passcode** \*6 601 - commissioning mode without printing

**# Distributor ID & Passcode** \*6 602 - commissioning mode with status printout

The commissioning mode is deactivated, by selecting option 5 from the commissioning menu.

The commissioning mode schedule on the pages 7-4 needs to be carried out from each extension.

When all of the extensions have been tested and the commissioning mode has been deactivated, the following engineering codes are available. The codes are accessed by entering the following sequence # Distributor ID & Passcode \*6.

603 - print the commissioning report

604 - remove commissioning mode from system - Use with care

 $605\,$  - Clear the commissioning report. (This is useful before entering the commissioning mode for the first time)

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Test	Action	Correct Response	Possible Problems
<del></del>	Telephone handset lifted	Line LED turns green on board. Dial Tone Heard in earpiece.	Wrong green LED lit →Ships wiring wrong Dial Tone not heard or very quiet
			→ Faulty telephone - Keplace telephone → Poor Ship wiring - Discconnect wire at exchange and check using test points → If still no dial tone heard, swap extension card.
2	Dial **	Dial tone goes silent.	Dial Tone continued to be heard → Telephone is old "LD" or Pulse - replace with modern DTMF telephone → Faulty telephone - check with know working telephone
3	Dial '6'	New tone heard.	
4	Replace handset	Telephone starts ringing. Line LED flashes at ringing cadence.	Rining Heard - test pass move to test 5 Ringing not heard → Ringing on telephone turned off - turn on → Ringer on telephone faulty - replace telephone with known working telephone → "BT" telephone used, which needs special socket, install special socket → Faulty extension card - swap extension card.
5	Lift handset	Message "Ring Test Sucessful" is heard in handset.	This message will always be heard as the exchange has no method of checking that the ringer is working
9	Replace handset	Line LED turns off on board.	

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## **Commission Mode Tests**

Test	Action	Response	Possible Problems
<del></del>	Telephone handset lifted	Line LED turns green on board. The Extension number and Exchange position is repeated continuously.	<ul> <li>Wrong green LED lit</li> <li>→Ships wiring wrong</li> <li>Wrong Extension number reported</li> <li>→ Incorrect configuration - Use command '1' to report correct extension number.</li> <li>Wrong Exchange port reported</li> <li>→ Incorrect ship wiring - Use command '3' to report correct exchange position.</li> <li>Dial Tone not heard or very quiet</li> <li>→ Faulty telephone - Replace telephone</li> <li>→ Poor Ship wiring - Disconnect wire at exchange and check using test points</li> <li>→ If still no dial tone heard, swap extension card.</li> </ul>
N	Check Extension Number Dial '1'	The extension number (and corrected number if entered) is reported. If the number is correct press '1'	If the number is wrong, but the correct number is not known, press '2' If the number is wrong, and the correct number is known, press '3' followed by the correct number ending with '#'. The system will then repeat the number. Press '1' to confirm the new number. Press '2' to discard the number. Press '3' to re-enter the number.
ε	Check Standard Rights Dial '2'	The default user ID (and corrected ID if entered) is reported. If the ID is correct press '1'	If the ID is wrong, but the correct ID is not known, press '2' If the ID is wrong, and the correct ID is known, press '3' followed by the correct ID ending with '#'. The system will then repeat the number. Press '1' to confirm the new ID. Press '2' to discard the ID. Press '3' to re-enter the ID.
4	DTMF Digit check Dial '7'	A message information that all DTMF keys should be pressed. As each key is pressed, the digit is repeated. When all keys have been pressed, a message reports all keys detected.	If a key is not recognised, wait 20 seconds and a prompt will ask if all keys have been pressed. Press '1' if all keys were pressed or press '2' if not all keys pressed.
വ	Ring Test Dial '9'	Replace the handset and the telephone will ring back. When the handset is lifted after the ringing has been heard, press '1' to confirm the test worked.	If the ringing is not heard within 20 seconds, lift the handset and press '2' to the prompt to mark the test failed. → Ringing on telephone turned off - turn on → Ringer on telephone faulty - replace telephone with known working telephone → "BT" telephone used, which needs special socket, install special socket → Faulty extension card - swap extension card.
9	Replace handset	Line LED turns off on board.	







#### **External Line Commissioning**

Before the external lines are commissioned, all of the extensions should be tested and the Marinex 3D programmed with the customers requirements.

#### Line Status

Each of the external lines has 8 bi-coloured LEDs for each of the lines and above the test RJ45 connectors there is a single bi-coloured LED for the board status.

The following colours are used to show the status of the lines or board. The LED will also flash in different patterns to show more information:

#### Line LEDs

Colour	Flashes	Meaning
Green	on	Line in use. For A M90 in watchdog mode, the LED is green if the watch-
		dog has failed.
Green	Yes	Line ringing (flashes in time with incoming ring cadence for AG2120
		module)
Green	Fast	Line has an MCL telephone and is being remote controlled
Orange	1	Line has been turned off
Orange	2	Line has been disabled in the configuration
Orange	3	Line has no configuration programmed
Red	1	Reserved
Red	2	Line has a hardware problem
Red	3	Reserved

#### **Board LED**

Colour	Flashes	Meaning
Green		Reserved
Orange	1	Board not recieving the required information from CPU
Orange	2	Board has been disabled in the configuration
Orange	3	Board has no configuration programmed
Red	1	The board has a hardware problem
Red	2	The board temperature is high
Red	3	The board temperature is too high, all lines have been turned off

#### Startup

On startup, the leds will flash red and green alternatively. As soon as the system has recongised the boards, all the LEDs will go off.

#### Test RJ45 connectors

There are two RJ45 connectors which are connected in parallel to the A & B lines of the external lines. The C&D lines are only present on the rear MDF. The connectors allow the lines to be tested or monitored without having to disconnect the lines. A break-out board to individual RJ45's is available from **mcl**.

#### Line Testing

There is no special commissioning mode for the external lines. The system needs to be running normally and the external equipment tested.



AG21	20 COIC Module Test	- Outgoing	
Test	Action	Response	Possible Problems
←	Dial the access code for the tie line. (Default is 800 upwards)	Line LED turns green on board. The dial tone from the external equipment is heard.	Wrong green LED lit →Wrong access code entered. No LED lit →Extension being used for testing does not have the right to access tie line. Quiet or no dial tone heard. → Poor Ship wiring - check using test point → If dial tone heard, swap AG2120 module or external card.
2	Check the external system through exchange.	System works as expected	If there are problems, further fault finding with mcl is required.
3	Replace handset	Line LED goes out. The external equipment detects dropped line.	
AG21	20 COIC Module Test	- Incoming	
Test	Action	Response	Possible Problems
←	Place an incoming call through the external equipment.	Line LED flashes in time with the incoming ring. Designated extension rings (The Default is extension 104)	The LED does not flash. → The ringing is not detected by the exchange. Check that the incoming ring is within detection parameters. Check that the incoming ring is detected on the test point, using a telephone. The Designated telephone does not ring. → Incorrect programming. Check the programming.
2	Lift handset on ringing extension	Line LED turns green on board. The system is connected to the external equipment.	

System works as expected

Check the external system through exchange

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1       Dial the access code for the public address line.       Line LED turns green on board.       Wrong green LED lit         1       the public address line.       The public address system is accessed       →Wrong access code entered.         1       (Default is 850 upwards)       The public address system is accessed       No LED lit         2       Check the external system       System works as expected       If there are problems, further fault finding with mcl required.         3       Replace handset       Line LED goes out.       The external equipment detects dropped line.	Test	Action	Response	Possible Problems
2       Check the external system works as expected       If there are problems, further fault finding with mcl required.         2       through exchange.       If there are problems, further fault finding with mcl required.         3       Replace handset       Line LED goes out.         3       Replace handset       The external equipment detects dropped line.	-	Dial the access code for the public address line. (Default is 850 upwards)	Line LED turns green on board. The public address system is accessed	Wrong green LED lit →Wrong access code entered. No LED lit →Extension being used for testing does not have the right to access tie line.
3 Replace handset Line LED goes out. The external equipment detects dropped line.	2	Check the external system through exchange.	System works as expected	If there are problems, further fault finding with <b>mcl</b> required.
	e	Replace handset	Line LED goes out. The external equipment detects dropped line.	

# M90 Signal Relay Module Test - Power Fail Mode

ActionResponsePossibleTurn the exchange onWhen the exchange has started up and is running, the main relay will be activated, and the contacts closed.PossibleTurn the exchange offNo LED will be on.No LED will be on.PossibleTurn the exchange offThe main relay will be de-activated and the contacts opened.PossibleReplace handsetLine LED goes out.PossiblePossible	Problems			
Action Turn the exchange on Turn the exchange off Replace handset	Response Possible	When the exchange has started up and is running, the main relay will be activated, and the contacts closed. No LED will be on.	The main relay will be de-activated and the contacts opened.	Line LED goes out. The external equipment detects dropped line.
	t Action	Turn the exchange on	Turn the exchange off	Replace handset

# M90 Signal Relay Module Test - Other Modes

The M90 signal relay module can be used in different modes, depending on the requirements discussed with mcl. Test schedules will be provided with these modes.





#### Default Configuration Table

This is the factory configuration for a 3U Marinex 3D. The extension are in slots 1 to 13 and are numbered from 100.

			-	-	-	-	-			-			-			-
Board	Port	Ext #	Class	Tie Access	PA Access	Transfer	Interrupt		Board	Port	Ext #	Class	Tie Access	PA Access	Transfer	Interrupt
1	1	100	Officer	<ul> <li>✓</li> </ul>	✓	~	✓	1	5	1	132	Crew		$\checkmark$	✓	
1	2	101	Officer	<ul> <li>✓</li> </ul>	✓	✓	✓	1	5	2	133	Crew		$\checkmark$	$\checkmark$	
1	3	102	Officer	<ul> <li>✓</li> </ul>	✓	✓	✓		5	3	134	Crew		$\checkmark$	✓	
1	4	103	Officer	<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>	✓	✓		5	4	135	Crew		$\checkmark$	✓	
1	5	104	Officer	✓	✓	✓	✓		5	5	136	Crew		$\checkmark$	✓	
1	6	105	Officer	✓	✓	✓	✓		5	6	137	Crew		$\checkmark$	✓	
1	7	106	Officer	✓	$\checkmark$	$\checkmark$	$\checkmark$		5	7	138	Crew		$\checkmark$	$\checkmark$	
1	8	107	Officer	✓	✓	✓	✓		5	8	139	Crew		$\checkmark$	$\checkmark$	
2	1	108	Crew		✓	✓			6	1	140	Crew		$\checkmark$	$\checkmark$	
2	2	109	Crew		✓	✓			6	2	141	Crew		$\checkmark$	$\checkmark$	
2	3	110	Crew		✓	✓			6	3	142	Crew		$\checkmark$	$\checkmark$	
2	4	111	Crew		✓	✓			6	4	143	Crew		$\checkmark$	✓	
2	5	112	Crew		✓	✓			6	5	144	Crew		$\checkmark$	$\checkmark$	
2	6	113	Crew		✓	✓			6	6	145	Crew		$\checkmark$	$\checkmark$	
2	7	114	Crew		✓	✓			6	7	146	Crew		$\checkmark$	$\checkmark$	
2	8	115	Crew		✓	✓			6	8	147	Crew		$\checkmark$	$\checkmark$	
3	1	116	Crew		✓	✓			7	1	148	Crew		$\checkmark$	$\checkmark$	
3	2	117	Crew		✓	✓			7	2	149	Crew		$\checkmark$	$\checkmark$	
3	3	118	Crew		✓	✓			7	3	150	Crew		$\checkmark$	$\checkmark$	
3	4	119	Crew		✓	✓			7	4	151	Crew		$\checkmark$	$\checkmark$	
3	5	120	Crew		✓	✓			7	5	152	Crew		$\checkmark$	$\checkmark$	
3	6	121	Crew		✓	✓			7	6	153	Crew		$\checkmark$	$\checkmark$	
3	7	122	Crew		✓	✓			7	7	154	Crew		$\checkmark$	$\checkmark$	
3	8	123	Crew		✓	✓			7	8	155	Crew		$\checkmark$	$\checkmark$	
4	1	124	Crew		✓	✓			8	1	156	Crew		$\checkmark$	$\checkmark$	
4	2	125	Crew		✓	✓			8	2	157	Crew		$\checkmark$	$\checkmark$	
4	3	126	Crew		✓	✓			8	3	158	Crew		$\checkmark$	$\checkmark$	
4	4	127	Crew		✓	✓			8	4	159	Crew		$\checkmark$	✓	
4	5	128	Crew		✓	✓		1	8	5	160	Crew		$\checkmark$	✓	
4	6	129	Crew		✓	✓		1	8	6	161	Crew		$\checkmark$	✓	
4	7	130	Crew	ĺ	✓	✓		1	8	7	162	Crew		$\checkmark$	✓	
4	8	131	Crew		$\checkmark$	$\checkmark$			8	8	163	Crew		$\checkmark$	✓	
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Board	Port	Ext #	Class	fie Access	A Access	ransfer	nterrupt		Board	Port	Ext #	Class	lie Access	A Access	ransfer	nterrupt
9	1	164	Crew		$\checkmark$	$\checkmark$			11	5	184	Passenger				
9	2	165	Crew		$\checkmark$	$\checkmark$			11	6	185	Passenger				
9	3	166	Crew		✓	✓			11	7	186	Passenger				
9	4	167	Crew		$\checkmark$	$\checkmark$			11	8	187	Passenger				
9	5	168	Crew		$\checkmark$	$\checkmark$			12	1	188	Passenger				
9	6	169	Crew		$\checkmark$	$\checkmark$			12	2	189	Passenger				
9	7	170	Crew		$\checkmark$	$\checkmark$			12	3	190	Passenger				
9	8	171	Crew		$\checkmark$	$\checkmark$			12	4	191	Passenger				
10	1	172	Passenger						12	5	192	Passenger				
10	2	173	Passenger						12	6	193	Passenger				
10	3	174	Passenger						12	7	194	Passenger				
10	4	175	Passenger						12	8	195	Passenger				
10	5	176	Passenger						13	1	196	Passenger				
10	6	177	Passenger						13	2	197	Passenger				
10	7	178	Passenger						13	3	198	Passenger				
10	8	179	Passenger						13	4	199	Passenger				
11	1	180	Passenger						13	5	200	Passenger				
11	2	181	Passenger						13	6	201	Passenger				
11	3	182	Passenger						13	7	202	Passenger				
11	4	183	Passenger						13	8	203	Passenger				

The external lines are in slots 14 to 15, starting in slot 15. They are numbered from 800 for AG2120 Tie lines, and from 850 for M10 Public Address Modules and from 890 for M90 signal Modules, except for the module in Slot 15 as this is the power/system fail relay output.

Board	Port	Access #	Туре	Default Extension
15	1	800	Tie Line	104
15	2	801	Tie Line	104
15	3	802	Tie Line	104
15	4	803	Tie Line	104
15	5	804	Tie Line	104
15	6	805	Tie Line	104
15	7	-	M90 Signal	-
15	8	850	M10 PA	-

Board	Port	Access #	Туре	Default Extension
14	1	806	Tie Line	104
14	2	807	Tie Line	104
14	3	808	Tie Line	104
14	4	809	Tie Line	104
14	5	810	Tie Line	104
14	6	811	Tie Line	104
14	7	890	M90 Signal	_
14	8	851	M10 PA	-



#### Standard Commissioning Report Sheets



#### **Commissioning Report Sheet**

These tables allow for a report to be kept as the Marinex 3D is commissioned. The first table is for a factory configuration. The blank sheet is for your use. For programmed systems, configurAID for Marinex 3D can produce similar check sheets.

Board	Port	Ext #	Ship Location	Correct Exchange Position	Correct Ext. #	Ring OK	DTMF OK	Notes
1	1	100						
1	2	101						
1	3	102						
1	4	103						
1	5	104						
1	6	105						
1	7	106						
1	8	107						
2	1	108						
2	2	109						
2	3	110						
2	4	111						
2	5	112						
2	6	113						
2	7	114						
2	8	115						
3	1	116						
3	2	117						
3	3	118						
3	4	119						
3	5	120						
3	6	121						
3	7	122						
3	8	123						
4	1	124						
4	2	125						
4	3	126						
4	4	127						
4	5	128						
4	6	129						
4	7	130						
4	8	131						



Board	Port	Ext #	Ship Location	Correct Exchange Position	Correct Ext. #	Ring OK	DTMF OK	Notes
5	1	132						
5	2	133						
5	3	134						
5	4	135						
5	5	136						
5	6	137						
5	7	138						
5	8	139						
6	1	140						
6	2	141						
6	3	142						
6	4	143						
6	5	144						
6	6	145						
6	7	146						
6	8	147						
7	1	148						
7	2	149						
7	3	150						
7	4	151						
7	5	152						
7	6	153						
7	7	154						
7	8	155						
8	1	156						
8	2	157						
8	3	158						
8	4	159						
8	5	160						
8	6	161						
8	7	162						
8	8	163						
9	1	164						
9	2	165						
9	3	166						
9	4	167						



Board	Port	Ext #	Ship Location	Correct Exchange Position	Correct Ext. #	Ring OK	DTMF OK	Notes
9	5	168						
9	6	169						
9	7	170						
9	8	171						
10	1	172						
10	2	173						
10	3	174						
10	4	175						
10	5	176						
10	6	177						
10	7	178						
10	8	179						
11	1	180						
11	2	181						
11	3	182						
11	4	183						
11	5	184						
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12	1	188						
12	2	189						
12	3	190						
12	4	191						
12	5	192						
12	6	193						
12	7	194						
12	8	195						
13	1	196						
13	2	197						
13	3	198						
13	4	199						
13	5	200						
13	6	201						
13	7	202						
13	8	203						



Board	Port	Ext #	Ship Location	Correct Exchange Position	Correct Ext. #	Ring OK	DTMF OK	Notes



Board	Port	Ext #	Ship Location	Correct Exchange Position	Correct Ext. #	Ring OK	DTMF OK	Notes

