

Test Instructions

Document Title:	MiX 2000 MK4: First and RF Tests		
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Document Approval

Production Testing: Winston Arendse

Date: 25th July 2025 Signature: _____



1. Overview

The purpose of this document is to define the procedures required to perform production testing on the MiX 2000 MK4 PCB Sub-Assembly and Electronic Unit Sub-Assembly:

Refer to the latest Assembly Family Tree for details regarding the PCB Sub-Assemblies and higher-level assemblies.

Attention: Observe proper ESD handling and storage precautions for handling electrostatic-sensitive devices while performing the following procedures.

1.1. Abbreviations

PCB	Printed Circuit Board
UUT	Unit Under Test
EU	Electronic Unit
GSM	Global System for Mobile Communications
PC	Personal Computer
UPS	Uninterruptible Power Supply
BoN	Bed of Nails
SA	Sub-Assembly
RF	Radio Frequency
VST	Vector Signal Transceiver

1.2. Test Equipment / Jig and Fixtures / Tools

See Appendix for images of the below-mentioned items:

- [A] Master NI PXI Controller Chassis
- [B] NI PXI Chassis with VST
- [C] Programmable DC Power Supply
- [D] Programmable DC Electronic Load
- [E] Nano-SIM Card
- [F] MiX 2000 MK4 Programming Test Bed-of-Nails
- [G] MiX 2000 MK4 RF Test Bed-of-Nails
- [H] UPS

2. First Test Procedure

2.1. Test Description

This test will be performed by the TestStand PC test software. The user will be required to insert the UUT into the MiX 2000 MK4 First Test BoN and start the appropriate PC test.

2.2. Pre-test Requirements

2.2.1. Ensure that the following items are powered up (NOTE: Switch these on if they are not already powered up):

- Mains power
- UPS
- NI PXI Controller Chassis
- Programmable DC Electronic Load
- MiX 2000 MK4 First Test BoN

2.2.2. Windows should automatically log into the Tester profile. In the event that the Windows log-in screen, however, does appear, use the following details to log into Windows:

- Domain: MIX
- Username: MiXTestOperator
- Password: AccOp123!

Wait 3-minutes for Windows to completely log in before launching the MiX 2000 MK4 First Test Application.

2.2.3. Ensure that the air pressure supplied to the BoN is set to a minimum of 4.5 bar.

2.2.4. NOTE: If/when shutting down Windows after all testing has been completed; first ensure that all test software has been completely exited. DO NOT "force shutdown" or "force close" any test software. Contact MiX Telematics Test Engineering in the event that the test software stops responding.

2.3. Test Procedure

- 2.3.1. On the Test PC, double-click the MiX 2000 MK4 First Test icon located on the desktop. The test application will launch and a Login dialog box will appear.

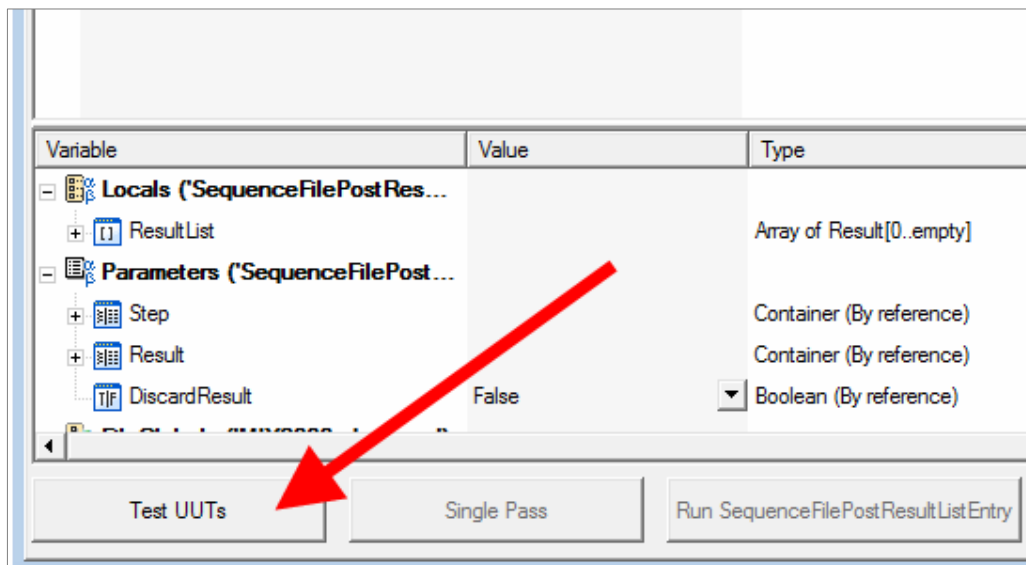


- 2.3.2. Select the appropriate User name from the drop-down menu.

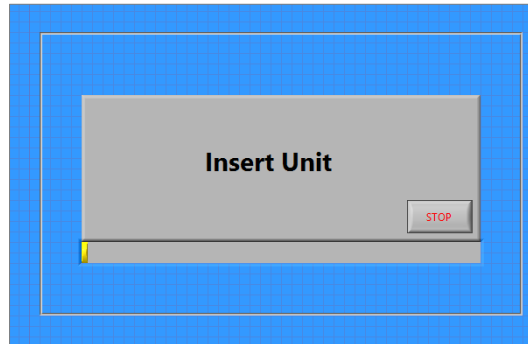
- 2.3.2.1. Enter your assigned Password and then click OK.

A login dialog box with a white background. It contains a "User" label, a drop-down menu showing "please select user", a "Password" label, and an empty password field. Below these are "OK" and "Cancel" buttons. At the bottom is the "mX | TELEMATICS" logo with the tagline "MOBILE INFORMATION EXCHANGE".

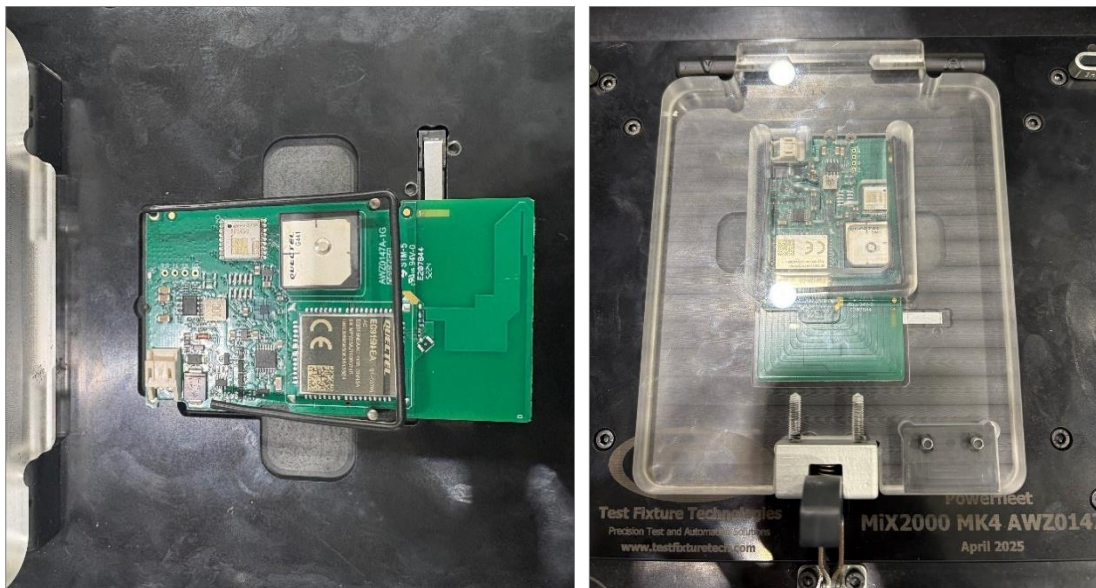
- 2.3.3. Click the "Test UUTs" button in the lower left corner of the window to initialise the test sequence.



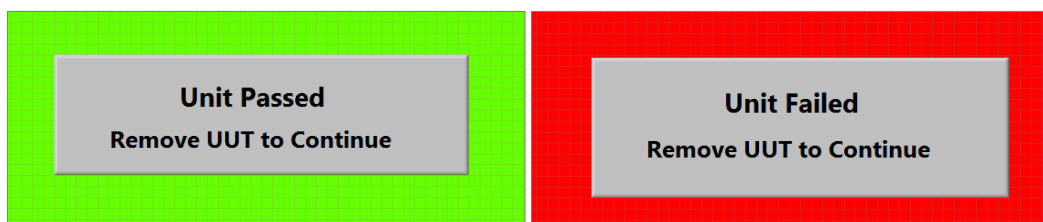
2.3.4. A prompt will appear requesting the user to insert the UUT into the test jig



2.3.5. Place the UUT onto the MiX 2000 MK4 First Test BoN using the locating pins and close the lid. The test will begin automatically once the lid is closed.



2.3.6. A PASS/FAIL prompt will be displayed once the test has completed.



If the test PASSED: The result is written to the results database. Remove the UUT from the BoN and place the UUT in the appropriate PASS tray. Refer to the relevant factory Work Instruction for further instructions.

If the test FAILED: Remove the UUT from the BoN and retest the UUT. If it fails a second time, remove the UUT from the BoN and refer to the appropriate factory Work Instruction for further actions.

3. RF Test Procedure

3.1. Test Description

This test will be performed by the TestStand PC test software. The user will be required to insert the UUT into the MiX 2000/2000 NG RF Test BoN and start the appropriate PC test. The test station allows for two UUTs to be tested simultaneously.

3.2. Pre-test Requirements

3.2.1. Ensure that the following items are powered up (NOTE: Switch these on if they are not already powered up):

- Mains power
- UPS
- NI PXI Controller Chassis Master + VST
- MiX 2000 RF Test BoN
- Programmable DC Power Supply

Allow 5-minutes for all the equipment to power up and enter a ready state before proceeding with the Windows log in.

NB: It is recommended that the NI PXI Controller Chassis Master + VST be powered up for at least 30-minutes prior to any testing.

3.2.2. Windows should automatically log into the Tester profile. In the event that the Windows log-in screen, however, does appear, use the following details to log into Windows:

- Domain: MIX
- Username: MiXTestOperator
- Password: AccOp123!

Wait 3-minutes for Windows to completely log in before launching the MiX 2000 MK4 RF Test Application.

3.2.3. Ensure that the air pressure supplied to the BoN is set to a minimum of 4.5 bar.

3.2.4. NOTE: If/when shutting down Windows after all testing has been completed; first ensure that all test software has been completely exited. DO NOT "force shutdown" or "force close" any test software. Contact MiX Telematics Test Engineering in the event that the test software stops responding.

3.3. Test Procedure

- 3.3.1. On the Test PC, double-click the MiX 2000 MK4 RF Test icon located on the desktop. The test application will launch and a Login dialog box will appear.



- 3.3.2. Select the appropriate User name from the drop-down menu. Enter your assigned Password and then click OK.

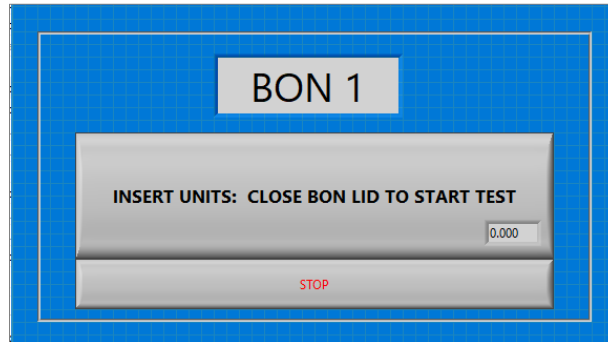
 A login dialog box with a white background. It contains a 'User' label, a drop-down menu showing 'please select user', a 'Password' label, and an empty password field. Below these are 'OK' and 'Cancel' buttons. At the bottom, the 'mX | TELEMATICS MOBILE INFORMATION EXCHANGE' logo is displayed.

- 3.3.3. Click the "Test UUTs" button in the lower left corner of the window to initialise the test sequence.

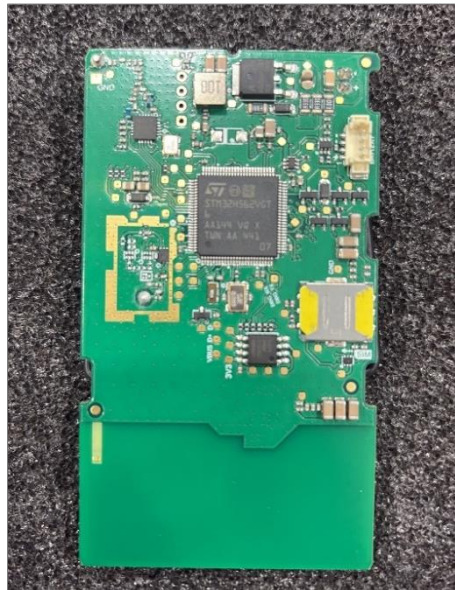
 A screenshot of the test application window. It features a table with columns 'Variable', 'Value', and 'Type'. The table is divided into 'Locals' and 'Parameters' sections. A red arrow points to the 'Test UUTs' button in the bottom left corner of the window.

Variable	Value	Type
Locals ('SequenceFilePostRes...'		
ResultList		Array of Result[0..empty]
Parameters ('SequenceFilePost...'		
Step		Container (By reference)
Result		Container (By reference)
DiscardResult	False	Boolean (By reference)

3.3.4. The user will be requested to insert the UUT(s) into the test jig and close the lid.



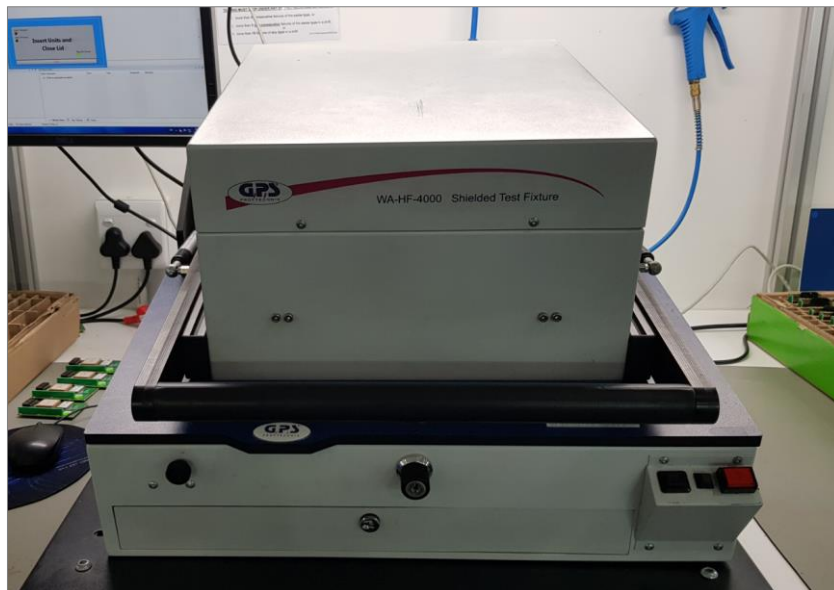
3.3.5. Insert the **supplied** nano-SIM card into the SIM card slot of the UUT.



3.3.6. Place the UUT(s) into the MiX2000 RF Test BoN 0 and/or 1 and close the lid(s).



- 3.3.7. Close the RF chamber lid by pulling down the clamp. The test will begin automatically once the lid engages.



- 3.3.8. A PASS/FAIL prompt will be displayed once the test has completed.

0: Passed

1: Passed

2: Failed

3: Passed

PRESS TO CONTINUE

Please open Shield/BoN and remove UUT(s) to continue

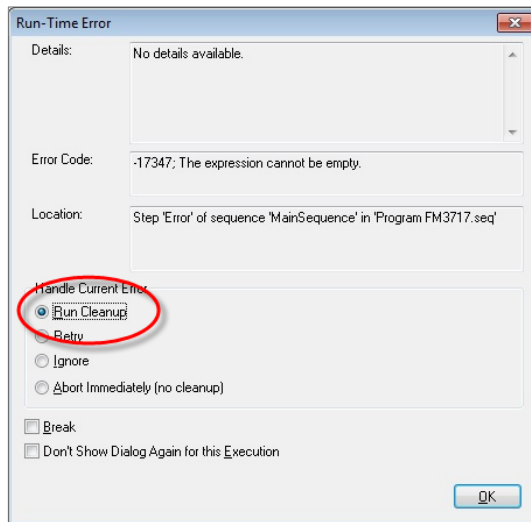
0.000

- **If the test PASSED:** Remove the UUT from the RF Test BoN. Mark the Unit Serial Number label to indicate that the UUT has passed. Place the UUT in the appropriate PASS tray. Refer to the appropriate factory work instruction for further actions.
- **If the test FAILED:** Remove the UUT from the RF Test BoN and retest the UUT. If it fails a second time, remove the UUT from the BoN. Click the "View Report" button to view which test step has failed and then refer to the appropriate factory work instruction for further actions.

NB: Please refer to the MiX Telematics Special Instructions Document (440MAZ053A) for instruction on whether to remove the nano SIM card after the RF Test Phase.

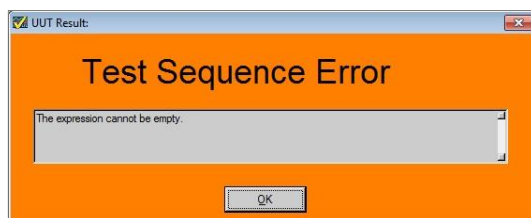
4. Troubleshooting

4.1.1. In the event that an error occurs during the test sequence, the following steps shall be followed:

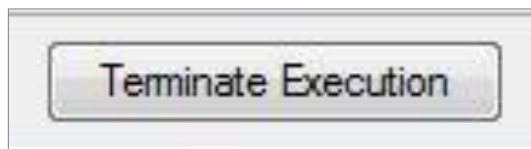


If an unrecoverable error occurs within an individual test sequence, a "Run-Time Error" window will appear.

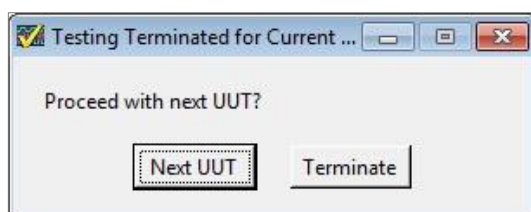
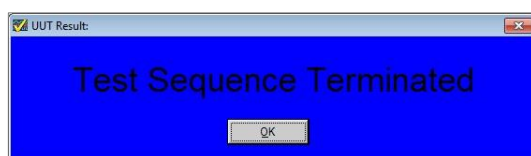
- Select "Run Cleanup" under the Handle Current Error heading and click OK. This will execute a test software cleanup to recover the test sequence.
- Once the CleanUp has been completed, a "Test Sequence Error" message will appear. Click OK to restart the test sequence.
- Remove the UUT from the test jig.
- If the fault persists after three consecutive tries, exit all test software and restart Windows.



4.1.2. If a test sequence hangs for some reason and the user wishes to terminate the test sequence, the following steps shall be followed:

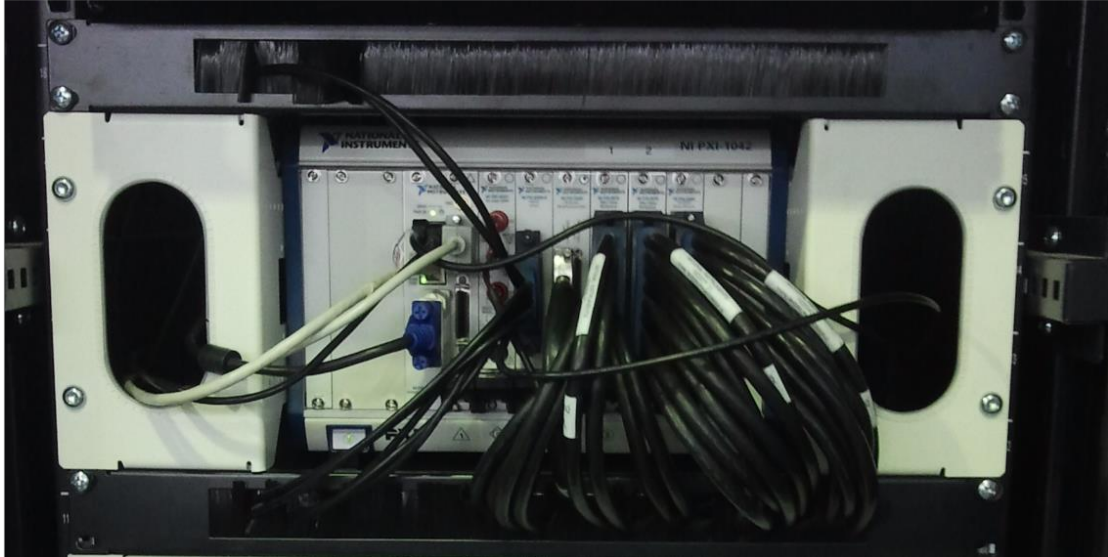


- Click the "Terminate Execution" button to abort the test sequence.
- Wait until the "Test Sequence Terminated" message appears before removing the UUT from the Test Jig. Click OK.
- A prompt will appear asking whether the user would like to proceed with the next UUT. Clicking "Next UUT" will restart the test procedure.



5. Appendix

[A] Master NI PXI Controller Chassis

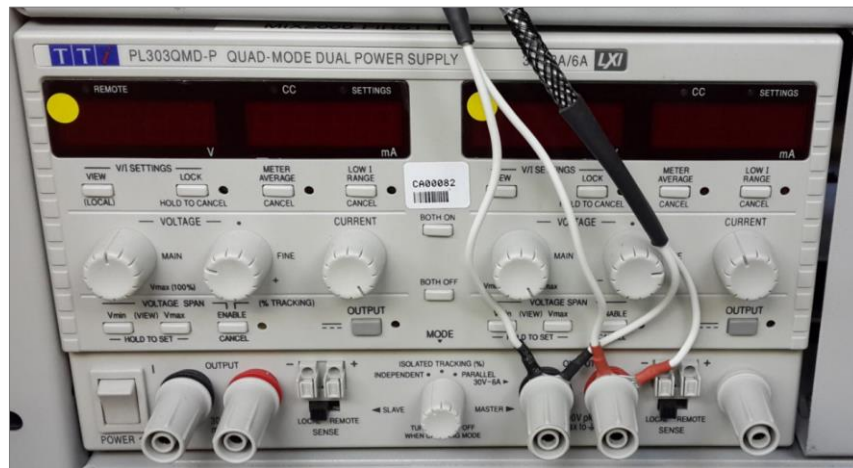


[B] NI PXI Chassis with VST



Test Instructions

[C] Programmable DC Power Supply



[D] Programmable DC Electronic Load



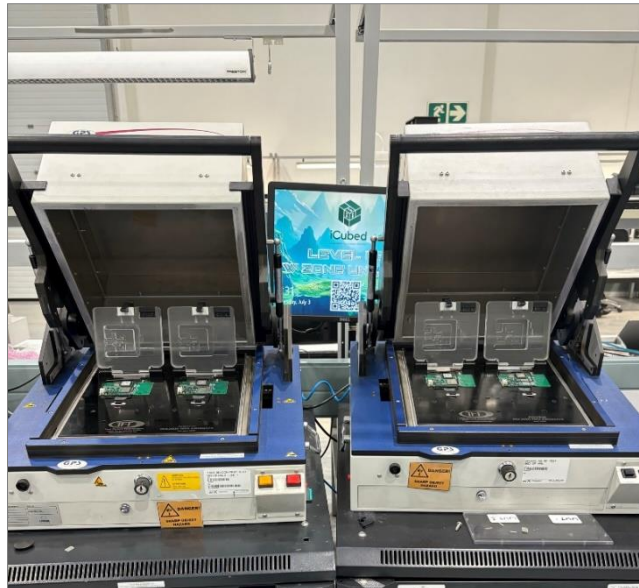
[E] Nano-SIM Card



[F] MiX 2000 MK4 Programming Test Bed-of-Nails



[G] MiX 2000 MK4 RF Test Bed-of-Nails



[H] UPS

