AutoHaul®

Project No: AUASFP88

COMMISSIONING - AC - NIU II Lab Certificates

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| Locomotive ID: | %LOCONAME% |

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# Introduction

## Overview

Rio Tinto Iron Ore (RTIO) operates a heavy-haul railway in the Pilbara region of Western Australia designed to move iron ore from mines located 300 to 500 km inland to ports for shipping overseas.

The AutoHaul® Project is concerned with the introduction of a system to automatically drive trains on the mainline. This includes trainborne, control centre, and wayside systems to control and monitor locomotives and ensure the safe movement of driverless trains, both in driver attended and driverless mode of operation.

The AutoHaul lab has been set up to allow configuration and testing of equipment prior to it being installed on a locomotive.

## Purpose

The purpose of this document is to provide the certificates for the AutoHaul site lab work for the AC NIU II fleet.

## Definitions, Acronyms and Abbreviations

Table 1‑1 Abbreviations and Acronyms

| Abbreviation/Acronym | Definition |
| --- | --- |
| ASTS | Ansaldo STS |
| ATP | Automatic Train Protection |
| ATS | Automatic Train Supervision |
| BSC | Banker Separation Confirmation |
| BTM | Balise Transmission Module |
| DLC | Direct Locomotive Control |
| ECP | Electronically Controlled Pneumatic (Braking) |
| EVO | Evolution Series Locomotive |
| GE | General Electric |
| LCS | Locomotive Control System |
| LHI | Locomotive Hardware Interface |
| NIU | Network Interface Unit |
| RTIO | Rio Tinto Iron Ore |
| RTRD | Rio Tinto Rail Division |
| VICS | Video Image Capture System |

## References

Unless otherwise specified, each document reference is to the latest approved revision.

1. AutoHaul NVIP Address Plan – 90000047.P01.EN
2. AutoHaul Satellite Phone – Phone Book Entries – 90000739.P00.EN
3. Onboard IP System Configurations – 90000847.R00.EN
4. AutoHaul Site Lab Operation Plan – 90000803.P00.EN
5. AutoHaul Onboard Commissioning Testers Guide – 90000246.G00.EN
6. Current Sensor Module Programming Guide – 90000216.G00.EN
7. AC NIU II ATO-A Commissioning Procedure 90001019.E02.EN

# Test Overview

## Location

These tests are undertaken in the AutoHaul site lab at 8 mile.

## Responsibilities

The tests will be completed by the AutoHaul commissioning team personnel.

The commissioning engineer is responsible for checking over the completion of all tests. They are also responsible transferring completed test results into the commissioning procedure [7] after confirming that the equipment tested in the lab has the same serial number as the equipment installed on the locomotive.

The AutoHaul stores team, consisting of shed and commissioning stores are responsible for materials management.

For full details of responsibilities, refer to the AutoHaul Site Lab Operation Plan [4].

## Equipment Setup

The equipment must be setup as per the diagrams in each test procedure.

## Equipment Programming

The equipment must be programmed with the correct software according to the Software Product Configuration issued by the commissioning manager. Software installations must be verified and signed by a second tester.

# Collision Detection System – Sensor Kit

## Hardware Details

| **Table 1: Collision Detection System - Sensor Kit - Hardware Details** | | | |
| --- | --- | --- | --- |
| **Hardware Item** | **Serial Number** | **Note** | **Onboard HW Verification** |
|  | **Text** |  | **UserSignature** |
| Force Washer Top Left |  | Results Transferred into eWMS upon correct serial audit Onboard. |  |
| Force Washer Top Right |  |  |
| Force Washer Bottom Left |  |  |
| Force Washer Bottom Right |  |  |
| Accelerometer Top |  |  |
| Accelerometer Bottom |  |  |

## Test Procedure

| **Table 2: Collision Detection System - Sensor Kit - Test Procedure** | | | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Procedure** | **Expected Result** | | | | | **Outcome** | **Signature** | | | | **Transferable** |
|  |  | | | | | **Text** | **UserSignature** | | | |  |
| ****Bottom Left Force Washer**** | | | | | | | | | | | |
| Connect the laptop to CDSL J8.  Use the CMD600 Software Assistant to verify the configuration.  Note: The CMD600 slightly modifies the sensitivity and physical gain values when they are saved, so these are only approximate. | Sensitivity: 4.35 pC/N | | | | |  |  | | | | **YES** |
| Physical Gain: 20, 000 | | | | |  |  | | | |
| Low Pass Filter (-3dB): 30, 000 Hz | | | | |  |  | | | |
| High Pass Filter (-3dB): 0.15 Hz | | | | |  |  | | | |
| Use the Line Recorder window, and tap the force washer to verify that the sensor is working. | Impacts are seen on the Line Recorder window. | | | | |  |  | | | | **NO** |
| ****Top Right Force Washer**** | | | | | | | | | | | |
| Connect the laptop to CDSL J9.  Use the CMD600 Software Assistant to verify the configuration.  Note: The CMD600 slightly modifies the sensitivity and physical gain values when they are saved, so these are only approximate. | Sensitivity: 4.35 pC/N | | | | |  |  | | | | **YES** |
| Physical Gain: 20, 000 | | | | |  |  | | | |
| Low Pass Filter (-3dB): 30, 000 Hz | | | | |  |  | | | |
| High Pass Filter (-3dB): 0.15 Hz | | | | |  |  | | | |
| Use the Line Recorder window, and tap the force washer to verify that the sensor is working. | Impacts are seen on the Line Recorder window. | | | | |  |  | | | | **NO** |
| ****Bottom Right Force Washer**** | | | | | | | | | | | |
| Connect the laptop to CDSR J8.  Use the CMD600 Software Assistant to verify the configuration.  Note: The CMD600 slightly modifies the sensitivity and physical gain values when they are saved, so these are only approximate. | | Sensitivity: 4.35 pC/N | |  | | |  | | **YES** | | |
| Physical Gain: 20, 000 | |  | | |  | |
| Low Pass Filter (-3dB): 30, 000 Hz | |  | | |  | |
| High Pass Filter (-3dB): 0.15 Hz | |  | | |  | |
| Use the Line Recorder window, and tap the force washer to verify that the sensor is working. | | Impacts are seen on the Line Recorder window. | |  | | |  | | **NO** | | |
| **Top Left Force Washer** | | | | | | | | | | | |
| Connect the laptop to CDSR J9.  Use the CMD600 Software Assistant to verify the configuration.  Note: The CMD600 slightly modifies the sensitivity and physical gain values when they are saved, so these are only approximate. | | Sensitivity: 4.35 pC/N | |  | | |  | | **YES** | | |
| Physical Gain: 20, 000 | |  | | |  | |
| Low Pass Filter (-3dB): 30, 000 Hz | |  | | |  | |
| High Pass Filter (-3dB): 0.15 Hz | |  | | |  | |
| Use the Line Recorder window, and tap the force washer to verify that the sensor is working. | | Impacts are seen on the Line Recorder window. | |  | | |  | | **NO** | | |
| ****Accelerometers**** | | | | | | | | | | | |
| Connect the laptop to CDSL J5.  Access the CDP Monitor web interface at:  <CDSL IP Address>:8000/CDPMonitor.html  Shake the accelerometers and confirm they are operating correctly by looking at the CDP Monitor (Processed screen). | | | Row 5 – Accelerometer – Bottom (ACL) | |  | | |  | | **NO** | |
| Row 6 – Accelerometer – Top (ACU) | |  | | |  | |

# BTM Antennas

## Hardware Details

| **Table 3: BTM Antennas – Hardware Details** | |
| --- | --- |
| **Hardware Item** | **Serial Number** |
|  | **Text** |
| BTM-N Antenna |  |
| BTM-R Antenna |  |

## Test Procedures

| **Table 4: BTM Antennas – Test Procedures** | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| **Action** | **Expected Result** | **Outcome** | **Signature** | | **Transferable** | |
|  |  | **Text** | **UserSignature** | |  | |
| ****BTM-N**** | | | | | | |
| Set the RF Analyser range to 20.0MHz to 40.0MHz.  Set the RF Analyser marker #1 to 27.000MHz.  Measure the VSWR for the BTM-N TX feeder and antenna at **27MHz**.  Save as: **<LOCOID>\_LAB\_BTMN\_VSWR** | VSWR < 1.4 |  |  | | **NO** | |
| ****BTM-R**** | | | | | |
| Set the RF Analyser range to 20.0MHz to 40.0MHz.  Set the RF Analyser marker #1 to 27.000MHz.  Measure the VSWR for the BTM-R TX feeder and antenna at **27MHz**.  Save as: **<LOCOID>\_LAB\_BTMR\_VSWR** | VSWR < 1.4 |  |  | **NO** | |

# WiMAX GPS Antennas and Feeder 1

## Hardware Details

| **Table 5: WIMAX GPS ANTENNAS AND FEEDER 1 – Hardware Details** | |
| --- | --- |
| **Hardware Item** | **Serial Number** |
|  | **Text** |
| WiMAX GPS Antenna |  |
| Wimax Atenna 2 |  |

## Test Procedures

| **Table 6: WIMAX GPS ANTENNAS AND FEEDER 1 – Test Procedures** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Action** | **Expected Result** | **Outcome** | **Signature** | **Notes** | **Transferable** |
|  |  | **Text** | **UserSignature** |  |  |
| WiMAX (1) GPS Antenna and Wimax (2) Antenna with Feeder Wires | | | | | |
| **WM1\_RL**  Set the RF Analyser range to 3400MHz to 3700MHz.  Connect a test lead to the FieldFox RF OUT port.  Select measurement - *Measure (1) / Return Loss (dB)*.  Calibrate the unit - *Cal (5) / Start Cal*.  Connect the test lead to WiMAX antenna 1 cable.  Measure the minimum return loss.  Save as: **<LOCOID>\_LAB\_WM1\_RL** | Return loss > 11.7dB |  |  | An O, S, L calibration tool is required for these tests, the QuickCal calibration will not work. | **NO** |
| **WM2\_RL**  Set the RF Analyser range to 3400MHz to 3700MHz.  Connect a test lead to the FieldFox RF OUT port.  Select measurement - *Measure (1) / Return Loss (dB)*.  Calibrate the unit - *Cal (5) / Start Cal*.  Connect the test lead to WiMAX antenna 2 cable at the WiMAX unit.  Measure the minimum return loss.  Save as: **<LOCOID>\_WM2\_RL** | Return loss > 12.7 dB |  |  | An O, S, L calibration tool is required for these tests, the QuickCal calibration will not work. | **NO** |
| WiMAX GPS Antenna Function Test | | | | | |
| Power OFF the Lab Gemini Radio  Connect the GPS Antenna cable connector into the Gemini Radio.  Power ON the Gemini Radio  Wait 3 minutes  PWR LED on Gemini should blink green/amber at 1 Hz | PWR LED on Gemini should blink green/amber at 1 Hz |  |  |  | **NO** |
| Log into the Gemini Radio via web browser  Navigate to GPS – Status on the side menu.  Check the following states:   1. Condition 2. Number of SVs | Condition = “Differential”  Number of SVs > 0 |  |  |  | **NO** |

# Data Radio Antennas and Feeders

## Test Procedures

| **Table 7: Data Radio Antennas and Feeders – Test Procedures** | | | | |
| --- | --- | --- | --- | --- |
| **Action** | **Expected Result** | **Outcome** | **Signature** | **Transferable** |
|  |  | **Text** | **UserSignature** |  |
| Data Radio RX Antenna (whip style) and Feeder | | | | |
| Set the RF Analyser range to 470.0MHz to 490.0MHz.  Connect a test lead to the FieldFox RF OUT port.  Calibrate the unit (1 port).  Connect the test lead to Data Radio RX antenna feeder cable.  Measure the minimum return loss.  Save as: **<LOCOID>\_DR\_RX\_RL** | Return loss > 9.5dB |  |  | **NO** |
| Data Radio TX/RX Antenna (whip style) and Feeder | | | | |
| Set the RF Analyser range to 470.0MHz to 490.0MHz.  Connect a test lead to the FieldFox RF OUT port.  Calibrate the unit (1 port).  Connect the test lead to Data Radio TX/RX antenna feeder cable.  Measure the minimum return loss.  Save as: **<LOCOID>\_DR\_TX\_RL** | Return loss > 9.5dB |  |  | **NO** |

# Voice Radio Antenna

## Hardware Details

| **Table 8: Voice Radio Antenna – Hardware Details** | |
| --- | --- |
| **Hardware Item** | **Serial Number** |
|  | **Text** |
| RX Antenna |  |

## Test Procedure

| **Table 9: Voice Radio Antenna – Test Procedures** | | | | |
| --- | --- | --- | --- | --- |
| **Action** | **Expected Result** | **Outcome** | **Signature** | **Transferable** |
|  |  | **Text** | **UserSignature** |  |
| Voice Radio RX Antenna (stapler style) and Feeder | | | | |
| Set the RF Analyser range to 470.0MHz to 490.0MHz.  Calibrate the unit (1 port).  Connect the RF OUT test lead to Voice Radio RX antenna feeder cable.  Measure the minimum return loss.  Save as: **<LOCOID>\_LAB\_VR\_RX\_RL** | Return loss > 11.7dB |  |  | **NO** |

# Voice Radio Subsystem

## Hardware Details

| **Table 10: Voice Radio Subsystem – Hardware Details** | |
| --- | --- |
| **Hardware Item** | **Serial Number** |
|  | **Text** |
| Notch Filter |  |
| High Pass Filter |  |
| Voice Radio Power Divider |  |
| Circulator / Isolator 1 |  |
| Circulator / Isolator 2 |  |
| Low Noise Amplifier 1 |  |
| Low Noise Amplifier 2 |  |
| 6dB Attenuator 1 |  |
| 6dB Attenuator 2 |  |

## Test Procedures

| **Table 11: Voice Radio Subsystem – Test Procedures** | | | | |
| --- | --- | --- | --- | --- |
| **Action** | **Expected Result** | **Outcome** | **Signature** | **Transferable** |
|  |  | **Text** | **UserSignature** |  |
| Voice Radio 1 RX Filters | | | | |
| **Important**: Set RF Tester to Low Power  Set the RF Analyser range to 450.0MHz to 520.0MHz.  Calibrate the unit (2 port).  Connect the RF OUT test lead to the Notch Filter IN port.  Connect the RF IN test lead to the Circulator / Isolator 1 TX/RX port.  Set the RF Analyser marker #1 to 470.000MHz.  Set the RF Analyser marker #2 to 477.000MHz.  Set the RF Analyser marker #3 to 482.000MHz.  Set the RF Analyser marker #4 to 490.000MHz.  Set the RF Analyser marker #5 to 479.000MHz.  Set the RF Analyser marker #6 to 479.950MHz.  Record the loss at the markers.  Save as: **<LOCOID>\_LAB\_VR1\_RX\_FILTER\_IL**  If not continuing to VR2\_RX\_FILTER\_IL return power level to High | -1.5 < M1 Loss < 1dB | M1: |  | **NO** |
| -1.5 < M2 Loss < 1dB | M2: |
| -1.5 < M3 Loss < 1dB | M3: |
| -1.5 < M4 Loss < 1dB | M4: |
| M5 Loss > 25dB | M5: |
| M6 Loss > 25dB | M6: |
| Record the LNA setting. | N/A |  |  | **NO** |
| Voice Radio 2 RX Filters | | | | |
| **Important**: Set RF Tester to Low Power  Set the RF Analyser range to 450.0MHz to 520.0MHz.  Calibrate the unit (2 port).  Connect the RF OUT test lead to the Notch Filter IN port.  Connect the RF IN test lead to the Circulator / Isolator 2 TX/RX port.  Set the RF Analyser marker #1 to 470.000MHz.  Set the RF Analyser marker #2 to 477.000MHz.  Set the RF Analyser marker #3 to 482.000MHz.  Set the RF Analyser marker #4 to 490.000MHz.  Set the RF Analyser marker #5 to 479.000MHz.  Set the RF Analyser marker #6 to 479.950MHz.  Record the loss at the markers.  Save as: **<LOCOID>\_LAB\_VR2\_RX\_FILTER\_IL**  If not continuing to VR1\_RX\_FILTER\_IL return power level to High | -1.5 < M1 Loss < 1dB | M1: |  | **NO** |
| -1.5 < M2 Loss < 1dB | M2: |
| -1.5 < M3 Loss < 1dB | M3: |
| -1.5 < M4 Loss < 1dB | M4: |
| M5 Loss > 25dB | M5: |
| M6 Loss > 25dB | M6: |
| Record the LNA setting. | N/A |  |  | **NO** |
| Voice Radio 1 TX Filters | | | | |
| Set the RF Analyser range to 450.0MHz to 520.0MHz.  Calibrate the unit (2 port).  Connect the RF OUT test lead to the Circulator / Isolator 1 TX/RX port.  Connect the RF IN test lead to the Circulator / Isolator 1 TX port.  Set the RF Analyser marker #1 to 470.000MHz.  Set the RF Analyser marker #2 to 477.000MHz.  Set the RF Analyser marker #3 to 482.000MHz.  Set the RF Analyser marker #4 to 500.000MHz.  Record the loss at the markers.  Save as: **<LOCOID>\_LAB\_VR1\_TX\_FILTER\_IL** | M1 Loss < 3dB | M1: |  | **NO** |
| M2 Loss < 3dB | M2: |
| M3 Loss < 3dB | M3: |
| M4 Loss < 3dB | M4: |
| Set the RF Analyser range to 470.0MHz to 490.0MHz.  Connect a test lead to the FieldFox RF OUT port.  Calibrate the unit (1 port).  Connect the test lead to Circulator / Isolator 1 TX/RX port.  Terminate the Circulator / Isolator 1 TX port with a 50Ω load.  Measure the minimum return loss.  Save as: **<LOCOID>\_LAB\_VR1\_TX\_FILTER\_RL** | Return Loss > 15 dB |  |  | **NO** |
| Voice Radio 2 TX Filters | | | | |
| Set the RF Analyser range to 450.0MHz to 520.0MHz.  Calibrate the unit (2 port).  Connect the RF OUT test lead to the Circulator / Isolator 2 TX/RX port.  Connect the RF IN test lead to the High Pass Filter 2 OUT port.  Set the RF Analyser marker #1 to 470.000MHz.  Set the RF Analyser marker #2 to 477.000MHz.  Set the RF Analyser marker #3 to 482.000MHz.  Set the RF Analyser marker #4 to 500.000MHz.  Record the loss at the markers.  Save as: **<LOCOID>\_LAB\_VR2\_TX\_FILTER\_IL** | M1 Loss < 3dB | M1: |  | **NO** |
| M2 Loss < 3dB | M2: |
| M3 Loss < 3dB | M3: |
| M4 Loss < 3dB | M4: |
| Set the RF Analyser range to 470.0MHz to 490.0MHz.  Calibrate the unit (1 port).  Connect the RF OUT test lead to Circulator / Isolator 2 TX/RX port.  Terminate the High Pass Filter 2 OUT port with a 50Ω load.  Measure the minimum return loss.  Save as: **<LOCOID>\_LAB\_VR2\_TX\_FILTER\_RL** | Return Loss > 15 dB |  |  | **NO** |

# VICS Cameras

## Hardware Details

| **Table 12: VICS Cameras – Hardware Details** | | |
| --- | --- | --- |
| **Hardware Item** | **Serial Number** | **Note** |
|  | **Text** |  |
| Drivers Side Camera |  | Sign TCR when serial is verified on Loco |
| Observer Side Camera |  | Sign TCR when serial is verified on Loco |

## Test Procedures

| **Table 13: VICS Cameras – Test Procedures** | | | | |
| --- | --- | --- | --- | --- |
| **Action** | **Expected Result** | **Outcome** | **Signature** | **Transferable** |
|  |  | **Text** | **UserSignature** |  |
| **Note: This can be performed with the kit MDR if available (final programming is not required).** | | | | |
| Connect an Ethernet cable between the laptop and the Maintenance port of the MDR-5R.  The Maintenance port (LAN 1) is on the same side as the LCD panel.  Change the laptop IP address to the following:  IP address: **192.168.0.101**  Subnet: **255.255.255.0**  Open **Remote Desktop Connection**.  Connect to Computer: **192.168.0.100** | Prompt for login details appears. |  |  | **NO** |
| Enter the details:  Username: **administrator**  Password: **adminrio11** | Remote login successful. |  |  | **NO** |
| Verify the driver side camera settings as per 90000505.E00.EN. (VICS Software Update Procedure) | As per 90000505.E00.EN. |  |  | **YES** |
| Verify the observer side camera settings as per 90000505.E00.EN.  (VICS Software Update Procedure) | As per 90000505.E00.EN. |  |  | **YES** |
| On the desktop, open the **Video Manager** program. | Video Manager launched successfully.  Live video streams are displayed successfully. |  |  | **NO** |
| Confirm that the video from both cameras are clear and unobstructed. | Live video streams do not contain any image defect. |  |  | **NO** |

# Current Sensors

## Inspection

| **Table 14: Current Sensors - Inspection** | | | |
| --- | --- | --- | --- |
| **Item** | **Outcome** | **Signature** | **Transferable** |
|  | **Text** | **UserSignature** |  |
| Serial Number of panel |  |  | N/A |
| All fixings Present and Tight | N/A |  | N/A |
| End stops on Din rail Present and Tight | N/A |  | N/A |
| All wires correctly terminated and tight | N/A |  | N/A |
| One magnet on steel wire present | N/A |  | N/A |
| Current sensor legend present and correct revision. | N/A |  | N/A |
| Bell tested as per current Drawings (Revision 7) | N/A |  | N/A |

## Test Procedures

| **Table 15: Current Sensors – Test Procedures** | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Action** | **Expected Result Range**  **(min)** | **Expected Result Range**  **(Max)** | **Expected Result Upper Limit** | **Behaviour Time delay On/Off** | **Outcome** | **Signature** | **Transferable** |
|  |  |  |  |  | **Text** | **UserSignature** |  |
| Check the ATO Status Light (CATOS) current sensor settings. | 0 | 1 | 0.45 | 1.0s |  |  | **YES** |
| Check the Not Safe to Board/Alight Lights (CNSBAL) current sensor settings. | 0 | 1 | 0.07 A | 1.0s |  |  | **YES** |
| Check the Safe to Board/Alight Lights (CSBAL) current sensor settings | 0 | 1 | 0.06 A | 1.0s |  |  | **YES** |
| Check the Strobe Light B (CSLB) current sensor settings. | 0 | 1 | 0.1 A | 0.0s |  |  | **YES** |
| Check the Strobe Light A (CSLA) current sensor settings. | 0 | 1 | 0.1 A | 0.0s |  |  | **YES** |
| Check the Ditch Light Left (CDLSL) current sensor settings. | 0 | 5 | 2.5 A | 0.0s |  |  | **YES** |
| Check the Ditch Light Right (CDLSR) current sensor settings. | 0 | 5 | 2.5 A | 0.0s |  |  | **YES** |
| Check the Front Headlight 2 (CFHL2) current sensor settings. | 0 | 5 | 1.4A | 1.0s |  |  | **YES** |
| Check the Front Headlight 1 (CFHL1) current sensor settings. | 0 | 5 | 1.4 A | 1.0s |  |  | **YES** |

# Relay Panel

## Inspection

| **Table 16: Relay Panel - Inspection** | | | |
| --- | --- | --- | --- |
| **Item** | **Outcome** | **Signature** | **Transferable** |
|  | **Text** | **UserSignature** |  |
| Serial Number of panel |  |  | N/A |
| All fixings Present and Tight | N/A |  | N/A |
| Two magnets on steel wire present | N/A |  | N/A |
| End stops on Din rail Present and Tight | N/A |  | N/A |
| All relays Installed have 24Volt coils | N/A |  | N/A |
| All Relays Have Retaining clips present. | N/A |  | N/A |
| All wires correctly terminated and tight | N/A |  | N/A |
| All Covers installed correctly. | N/A |  | N/A |
| Relay Panel legend and revision label present and correct | N/A |  | N/A |
| Bell tested as per current Drawings (revision 3) | N/A |  | N/A |

# NVR

## Hardware Details

| **Table 17: NVR – Hardware Details** | | | |
| --- | --- | --- | --- |
| **Hardware Item** | **Serial Number** | **Note** | **Onboard HW Verified** |
|  | **Text** |  | **UserSignature** |
| NVR Unit |  | Sign TCR when serial is verified on Loco |  |

## Programming Details

| **Table 18: NVR – Programming Details** | | | |
| --- | --- | --- | --- |
| **Software Item** | **Software Version / File Name** | **Installed By** | **Verified By** |
|  | **Text** | **UserSignature** | **UserSignature** |
| NVR Firmware |  |  |  |
| NVR Config |  |  |  |

# Ansaldo Data logger (ADL)

## Hardware Details

| **Table 19: Ansaldo Data Logger – Hardware Details** | | |
| --- | --- | --- |
| **Hardware Item** | **Serial Number** | **Note** |
|  | **Text** |  |
| Data Logger |  | Sign TCR when serial is verified on Loco |

## Programming Details

| **Table 20: Ansaldo Data Logger – Programming Details** | | | |
| --- | --- | --- | --- |
| **Software Item** | **Software Version / File Name / Loco Number** | **Installed By** | **Verified By** |
|  | **Text** | **UserSignature** | **UserSignature** |
| Firmware Version |  |  |  |
| Configuration |  |  |  |

# WiMAX Subsystem

## Hardware Details

| **Table 21: WiMAX Subsystem – Hardware Details** | | | |
| --- | --- | --- | --- |
| **Hardware Item** | **Serial Number** | **Note** | **Onboard HW Verified** |
|  | **Text** |  | **UserSignature** |
| WiMAX Unit |  | Sign TCR when serial is verified on Loco |  |

## Programming Details

| **Table 22: WiMAX Subsystem – Programming Details** | | | |
| --- | --- | --- | --- |
| **Software Item** | **Software Version / File Name** | **Installed By** | **Verified By** |
|  | **Text** | **UserSignature** | **UserSignature** |
| WiMAX Primary Firmware Version |  |  |  |
| WiMAX Secondary Firmware Version |  |  |  |
| Configuration |  |  |  |

## Test Procedures

| **Table 23: WiMAX Subsystem – Test Procedures** | | | | |
| --- | --- | --- | --- | --- |
| **Action** | **Expected Result** | **Outcome** | **Signature** | **Transferable** |
|  |  | **Text** | **UserSignature** |  |
| **Note: This can be performed with the kit antennas and feeders if they have already been tested.** | | | | |
| Connect the laptop to the PoE Injector Ethernet port  Log into the WiMAX web interface (192.168.25.2).  Navigate to **Link Status** and check the following: | Active: Yes |  |  | **NO** |
| Status Code: 0x0000 |  |
| Data Link Condition: On |  |
| Downlink Burst Rate > 1Mb/s |  |
| Uplink Burst Rate > 1Mb/s |  |
| Downlink RSSI RF1 > -99dBm |  |
| Downlink RSSI RF2 > -99dBm |  |
| Uplink RSSI RF1 or RF2 > -99dBm |  |

# Data Radio System

## Hardware Details

| **Table 24: Data Radio System – Hardware Details** | | | |
| --- | --- | --- | --- |
| **Hardware Item** | **Serial Number** | **Note** | **Onboard H/W Verified** |
|  | **Text** |  | **UserSignature** |
| Data Radio |  | Sign TCR when serial is verified on Loco  Results have been transferred when correct serial audited. |  |

## Programming Details

| **Table 25: Data Radio System – Programming Details** | | | |
| --- | --- | --- | --- |
| **Software Item** | **Software Version / File Name** | **Installed By** | **Verified By** |
|  | **Text** | **UserSignature** | **UserSignature** |
| Data Radio Firmware Version |  |  |  |
| Data Radio Configuration File Name |  |  |  |

## Test Procedures

| **Table 47: Data Radio System – Test Procedures** | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Action** | | **Expected Result** | | **Outcome** | | **Signature** | | **Transferable** | |
|  | |  | | **Text** | | **UserSignature** | |  | |
| Data Radio Filters – Data Radio RX Port RX Filters (Insertion Loss) | | | | | | | | | |
| Set the RF Analyser range to 450.0MHz to 500.0MHz.  Connect test leads to the FieldFox RF ports and join the cables using an adaptor.  Calibrate the unit (2 port).  Connect the RF OUT test lead to the Band Pass Filter IN port.  Connect the RF IN test lead to the Band Pass Filter OUT port, via the cable from Data Radio to the Band Pass Filter.  Set the RF Analyser marker #1 to 469.800MHz.  Set the RF Analyser marker #2 to 478.wheel800MHz.  Set the RF Analyser marker #3 to 473.800MHz.  Set the RF Analyser marker #4 to 474.800MHz.  Record the loss at the markers.  Save as: **<LOCOID>\_LAB\_RX\_FILTER\_IL** | | M1 Loss > 50dB | | M1: | |  | | **YES** | |
| M2 Loss > 50dB | | M2: | |  | |
| M3 Loss < 3dB | | M3: | |  | |
| M4 Loss < 3dB | | M4: | |  | |
| Data Radio Filters – Data Radio RX Port RX Filters (Return Loss) | | | | | | | | | |
| Set the RF Analyser range to 473.8MHz to 474.8MHz.  Connect a test lead to the FieldFox RF OUT port.  Calibrate the unit (1 port).  Connect the test lead to Band Pass Filter IN port.  Terminate the Band Pass Filter OUT port with a 50Ω load.  Measure the minimum return loss.  Save as: **<LOCOID>\_LAB\_RX\_ FILTER\_RL** | | Return Loss > 15 dB | |  | |  | | **YES** | |
| Data Radio Filters - Data Radio TX/RX Port RX Filters (Insertion Loss) | | | | | | | | | |
| Set the RF Analyser range to 450.0MHz to 500.0MHz.  Connect test leads to the FieldFox RF ports and join the cables using an adaptor.  Calibrate the unit (2 port).  Connect the RF OUT test lead to the Duplexer ANT port.  Connect the RF IN test lead to the Circulator / Isolator TX/RX port, via the cable from Data Radio to the Circulator / Isolator.  Set the RF Analyser marker #1 to 468.000MHz.  Set the RF Analyser marker #2 to 478.800MHz.  Set the RF Analyser marker #3 to 473.800MHz.  Set the RF Analyser marker #4 to 474.800MHz.  Record the loss at the markers.  Save as: **<LOCOID>\_DR\_TXRX\_RXFILTER\_IL** | | M1 Loss > 35dB | | M1: | |  | | **YES** | |
| M2 Loss > 35dB | | M2: | |  | |
| M3 Loss < 3dB | | M3: | |  | |
| M4 Loss < 3dB | | M4: | |  | |
| Data Radio Filters - Data Radio TX/RX Port RX Filters (Return Loss) | | | | | | | | | |
| Set the RF Analyser range to 473.8MHz to 474.8MHz.  Connect a test lead to the FieldFox RF OUT port.  Calibrate the unit (1 port).  Connect the test lead to Duplexer ANT port.  Terminate the Isolator / Circulator TX/RX port with a 50Ω load.  Measure the minimum return loss.  Save as: **<LOCOID>\_DR\_ TXRX\_RXFILTER\_RL** | | Return Loss > 15 dB | |  | |  | | **YES** | |
| Data Radio Filters - Data Radio TX/RX Port TX Filters (Insertion Loss) | | | | | | | | | |
| Set the RF Analyser range to 450.0MHz to 500.0MHz.  Connect test leads to the FieldFox RF ports and join the cables using an adaptor.  Calibrate the unit (2 port).  Connect the RF OUT test lead to the Circulator / Isolator TX/RX port, via the cable from Data Radio to the Circulator / Isolator.  Connect the RF IN test lead to the Duplexer ANT port.  Set the RF Analyser marker #1 to 475.000MHz.  Set the RF Analyser marker #2 to 484.000MHz.  Set the RF Analyser marker #3 to 479.000MHz.  Set the RF Analyser marker #4 to 479.950MHz.  Record the loss at the markers.  Save as: **<LOCOID>\_DR\_TXRX\_TXFILTER\_IL** | | M1 Loss > 20dB | |  | |  | | **YES** | |
| M2 Loss > 20dB | |  | |  | |
| M3 Loss < 3dB | |  | |  | |
| M4 Loss < 3dB | |  | |  | |
| Data Radio Filters - Data Radio TX/RX Port TX Filters (Return Loss) | | | | | | | | | |
| Set the RF Analyser range to 479.0MHz to 480.0MHz.  Connect a test lead to the FieldFox RF OUT port.  Calibrate the unit (1 port).  Connect the test lead to Isolator / Circulator TX/RX port, via the cable from Data Radio to the Circulator / Isolator.  Terminate the Duplexer ANT port with a 50Ω load.  Measure the minimum return loss.  Save as: **<LOCOID>\_DR\_ TXRX\_TXFILTER\_RL** | | Return Loss > 15 dB | |  | |  | | **YES** | |
| Data Radio Tests – TX Tests | | | | | | | | |
| Connect a test lead from the HP 8920 **RF IN** port, to the Data Radio **Tx/Rx** port.  Set the HP 8920 to **TX TEST**.  Set the HP 8920 Tune Freq to 479.356250 MHz.  Set the frequency error readout to Hz.  Ensure the radio is warmed up and has been operating for more than 5 minutes.  Log into the Data Radio web interface.  Navigate to **Maintenance > RF Tests**  Click the **Mode >** **Test** button.  Click the **Goto** button for channel 9 (479.356250 MHz).  Select **Unmodulated** test tone.  Click **Execute**.  Check the frequency from HP 8920 and record the frequency error. | Frequency Error < 300Hz | | | |  |  | **YES** | |
| Record the RF power reading on the HP 8920. | Tx power = 24 W ± 10% | | | |  |  | **YES** | |
| RX Tests – TX/RX Port | | | | | | | | |
| Connect a test lead from the HP 8920 **RF OUT** port, to the Data Radio **Tx/Rx** port.  Set the HP 8920 to **RX TEST**.  Set the RF Gen Freq to **473.831250 MHz**.  Set the Amplitude to **-70dBm**.  Log into the Data Radio web interface.  Navigate to **Maintenance > RF Tests**  Click the **Goto** button for **Channel 2 (473.831250 MHz)**.  Check the RSSI Display, use the **Main – Cal** reading. | RSSI = -70 dBm ± 5dB | | | |  |  | **YES** | |
| Set the Amplitude to **-90dBm**. | RSSI = -90 dBm ± 5dB | | | |  |  | **YES** | |
| Set the Amplitude to **-110dBm**. | RSSI = -110 dBm ± 5dB | | | |  |  | **YES** | |
| Set the RF Gen Freq to **474.556250 MHz**.  Set the Amplitude to **-70dBm**.  Click the **Goto** button for **Channel 16 (474.556250 MHz)**. | RSSI = -70 dBm ± 5dB | | | |  |  | **YES** | |
| Set the Amplitude to **-90dBm**. | RSSI = -90 dBm ± 5dB | | | |  |  | **YES** | |
| Set the Amplitude to **-110dBm**. | RSSI = -110 dBm ± 5dB | | | |  |  | **YES** | |
| RX Tests – RX Port | | | | | | | | |
| Connect a test lead from the HP 8920 **RF OUT** port, to the Data Radio **Rx** port.  Set the HP 8920 to **RX TEST**.  Set the RF Gen Freq to **473.831250 MHz**.  Set the Amplitude to **-70dBm**.  Click the **Goto** button for **Channel 2 (473.831250 MHz)**.  Check the RSSI Display, use the **Diversity – Cal** reading. | RSSI = -70 dBm ± 5dB | | | |  |  | **YES** | |
| Set the Amplitude to **-90dBm**. | RSSI = -90 dBm ± 5dB | | | |  |  | **YES** | |
| Set the Amplitude to **-110dBm**. | RSSI = -110 dBm ± 5dB | | | |  |  | **YES** | |
| Set the RF Gen Freq to **474.556250 MHz**.  Set the Amplitude to **-70dBm**.  Click the **Goto** button for **Channel 16 (474.556250 MHz)**. | RSSI = -70 dBm ± 5dB | | | |  |  | **YES** | |
| Set the Amplitude to **-90dBm**. | RSSI = -90 dBm ± 5dB | | | |  |  | **YES** | |
| Set the Amplitude to **-110dBm**. | RSSI = -110 dBm ± 5dB | | | |  |  | **YES** | |
| Data Radio Ping Test | | | | | | | | | | |
| **Note: This can be performed with the kit antenna and feeder if convenient.** | | | | | | | | | | |
| Set the laptop IP details to:  IP Address: 192.168.201.10  Subnet Mask: 255.255.255.0  Gateway: 192.168.201.1  Open a command prompt window and enter:  ping 10.213.120.49 –w 12000 | | | No packets lost. | |  |  | | **NO** | | |

# RF Result Verification

| **Table 26: RF Result Verification** | | | |
| --- | --- | --- | --- |
| **Procedure** | **Expected Result** | **Result** | **Signature** |
|  |  | **Text** | **UserSignature** |
| Lead Lab Engineer to confirm all RF results are on the drive | All RF screen shots on drive | N/A |  |
| Communication Engineer to verify all RF results | Confirm all results are within spec | N/A |  |

# BTM Units

## Hardware Details

| **Table 27: BTM Units – Hardware Details** | | |
| --- | --- | --- |
| **Hardware Item** | **Serial Number** | **Note** |
|  | **Text** |  |
| BTM-N |  | Sign TCR when serial is verified on Loco |
| BTM-R |  |

## Programming Details

| **Table 28: BTM Units – Programming Details** | | | |
| --- | --- | --- | --- |
| **Software Item** | **Software Version / File Name** | **Installed By** | **Verified By** |
|  | **Text** | **UserSignature** | **UserSignature** |
| BTM-N Firmware Version |  |  |  |
| BTM-R Firmware Version |  |  |  |

# Collision Detection System Processors

## Hardware Details

| **Table 29: Collision Detection System Processors – Hardware Details** | | |
| --- | --- | --- |
| **Hardware Item** | **Serial Number** | **Note** |
|  | **Text** |  |
| CDSL |  | Sign TCR when serial is verified on Loco |
| CDSR |  |

## Programming Details

| **Table 30: Collission Detection System Processors – Programming Details** | | | |
| --- | --- | --- | --- |
| **Software Item** | **Software Version / File Name / Loco Number** | **Installed By** | **Verified By** |
|  | **Text** | **UserSignature** | **UserSignature** |
| CDSL Software Release Version |  |  |  |
| CDSR Software Release Version |  |  |  |
| CDSL Configuration |  |  |  |
| CDSR Configuration |  |  |  |

# DIVA Subsystem

## Hardware Details

| **Table 31: DIVA Subsystem – Hardware Details** | | |
| --- | --- | --- |
| **Hardware Item** | **Serial Number** | **Note** |
|  | **Text** |  |
| CCTE\_01 |  | Sign TCR when serial is verified on Loco |
| CCTE\_02 |  |
| CCTE\_03 |  |
| ACSDVP\_01 |  |
| ACSDVP\_02 |  |
| ACSDVP\_03 |  |
| MTORE\_01 |  |
| MTORE\_02 |  |
| CBOP\_01 |  |
| CBOP\_02 |  |
| BAT1 |  | Verification achieved by construction hardware serial capture & validation of JD files from the commissioning engineer. |
| BAT2 |  |

## Programming Details

| **Table 32: DIVA Subsystem – Programming Details** | | | |
| --- | --- | --- | --- |
| **Software Item** | **Software Version / File Name** | **Installed By** | **Verified By** |
|  | **Text** | **UserSignature** | **UserSignature** |
| DIVA Release |  |  |  |
| CCTE1 - APP |  |  |  |
| CCTE1 - CPL |  |  |  |
| CCTE1 - ME |  |  |  |
| CCTE1 - VOT |  |  |  |
| CCTE2 - APP |  |  |  |
| CCTE2 - CPL |  |  |  |
| CCTE2 - ME |  |  |  |
| CCTE2 - VOT |  |  |  |
| CCTE3 - APP |  |  |  |
| CCTE3 - ME |  |  |  |
| MTORE A |  |  |  |
| MTORE B |  |  |  |
| CBOP - CCTE1 |  |  |  |
| CBOP - LMTORA1\_BOUCHON |  |  |  |
| CBOP - CCTE2 |  |  |  |
| CBOP - LMTORB1\_BOUCHON |  |  |  |
| CBOP - CCTE3 |  |  |  |
| JDE - BAT1 (original CRC) |  |  |  |
| JDE - BAT2 (original CRC) |  |  |  |
| JDT - BAT1 (original CRC) |  |  |  |
| JDT - BAT2 (original CRC) |  |  |  |
| JDR - BAT1 (original CRC) |  |  |  |
| JDR - BAT2 (original CRC) |  |  |  |
| JDO - BAT1 (original CRC) |  |  |  |
| JDO - BAT2 (original CRC) |  |  |  |

| **Table 33: DIVA Subsystem – Upload Intervention Files** | |
| --- | --- |
| **Procedure** | **Signature** |
|  | **UserSignature** |
| Upload Intervention Files to Commissioning Drive |  |

## Test Procedures

| **Table 34: DIVA Subsystem – Test Procedures** | | | | |
| --- | --- | --- | --- | --- |
| **Procedure** | **Expected Result** | **Result** | **Signature** | **Transferable** |
|  |  | **Text** | **UserSignature** |  |
| Power up the DIVA in the rack.  Note: DIVA will not start up completely | No red LEDs on any CCTE cards. |  |  | **NO** |

# ATO Subsystem

## Hardware Details

| **Table 35: ATO Subsystem – Hardware Details** | | | |
| --- | --- | --- | --- |
| **Hardware Item** | **Serial Number** | **Note** | **Onboard HW Verified** |
|  | **Text** |  | **UserSignature** |
| ATOC-N CPU |  | Sign TCR when serial is verified on Loco |  |
| ATOC-R CPU |  |  |
| DSE-N CPU |  |  |
| DSE-R CPU |  |  |

## Programming Details

| **Table 36: ATO Subsystem – Programming Details** | | | |
| --- | --- | --- | --- |
| **Software Item** | **Software Version / File Name / MD5 Check Sum** | **Installed By** | **Verified By** |
|  | **Text** | **UserSignature** | **UserSignature** |
| ATO Base Version | Bootloader Self Diagnostic: |  |  |
| Self Diagnostic: |  |  |
| Boot Loader: |  |  |
| Release: |  |  |
| ATO Application | ATO Application Build: |  |  |
| Atoc.cfg: |  |  |
| Rcss.cfg: |  |  |
| Rc\_rtrd.cfg: |  |  |
| DSE Base Version | Base Release: |  |  |
| Partition size: |  |  |
| DSE Application Version |  |  |  |
| DSE Profiler |  |  |  |

## Hardware Clock Adjustment

| **Table 37: ATO Subsystem – Hardware Clock Adjustment** | | |
| --- | --- | --- |
| **Procedure** | **Signature** | **Notes** |
|  | **UserSignature** |  |
| **Configure the ATO Hardware clock as detailed in Appendix A - ATO Hardware Clock** | | |
| PuTTY (SSH) into ATO. |  | NOTE  It seems counter-intuitive that hwclock --utc would give the local time, but if you run dpkg-reconfigure tzdata command and complete it, it will show you what is the Local time and UTC/GMT time.  If hardware clock does not take try the following steps:   1. Plug in a screen and keyboard into the ATO-N 2. Power cycle the ATO.  Keep pressing delete as soon as power has been cycled to enter BIOS 3. Set system clock in BIOS to current Perth time.    1. Note this is using American format Type : mm/dd/yyyy       1. E.G. : 02/22/2016 4. Press F10 to save and exit 5. Putty into ATO and begin process again to set the hwclock 6. If still not working replace backup battery inside (BR2032 Coin cell battery) and repeat previous steps. |
| Type: ***dpkg-reconfigure tzdata***  Select the ***Australia***, then ***Perth***and Enter to confirm the change. |  |
| Type: ***hwclock --utc***  Check what ATO thinks the loco time is |  |
| Next you want to set the ATO’s hardware clock so that its local time is the correct Perth local time.  Type: ***hwclock --set --date “yyyy-mm-dd hh:mm:ss”***  E.G. *hwclock --set  --date  “2016-06-04 09:30:00”*  // note this is 24hr time format. |  |
| Type: ***hwclock --utc***  Check what ATO thinks the loco time is & it should now be Perth Local Time. |  |
| Power Cycle the ATO and *SSH*back into ATO and do step ***hwclock --utc***to ensure that the time has actually stuck. |  |
| **Configure the DSE Hardware clock as detailed in Appendix B - DSE Hardware Clock** | | |
| PuTTY (telnet) into the DSE. |  | For further information refer to #TEST\_INSTRUCTION 39A |
| Type the command ***date***  Check the current date & time on the DSE |  |
| Get the current UTC time from https://time.is/UTC |  |
| Set the date according to the UTC datetime with the following command: ***date dd mm yyyy***  e.g: For 9th June 2017: *date 9 6 2017* |  |
| Set the time according to the UTC datetime (24hour format) with the following command: *date hhmm*  e.g: For 9:45am: *date 0945* |  |
| Run the ***date*** command to confirm that you have set the correct UTC datetime. |  |
| Run the following command to set it to the hardware clock: ***rtc –s hw*** |  |
| Power cycle the ATO rack. |  |
| PuTTY (telnet) into the DSE and run ***date*** to confirm that the UTC datetime has stuck. |  |

# Tacho Wheel Sensors

| **Table 38: Tacho Wheel Sensors** | | | | |
| --- | --- | --- | --- | --- |
| **Procedure** | **Expected Result** | **Outcome** | **Signature** | **Notes** |
|  |  | **Text** | **UserSignature** |  |
| Construction team to provide wheel sensors for lab testing | N/A | N/A |  |  |
| Record Drivers Wheel Sensor Serial Number | S/N: |  |  |  |
| Record Observers Wheel Sensor Serial Number | S/N: |  |  |  |
| Connect Drivers side Wheel Sensor to test bench with oscilloscope and confirm that all three sensor heads pass | The three square waves are offset and at the same height. Square waves should be continuous with no dropped pulses | N/A |  | Take photo of results on oscilloscope and save on commissioning drive |
| Connect Observers side Wheel Sensor to test bench with oscilloscope and confirm that all three sensor heads pass | The three square waves are offset and at the same height. Square waves should be continuous with no dropped pulses | N/A |  | Take photo of results on oscilloscope and save on commissioning drive |

# NDL 2 Processor

## Hardware Details

| **Table 39: NDL 2 Processor – Hardware Details** | | | |
| --- | --- | --- | --- |
| **Hardware Item** | **Serial Number** | **Note** | **Onboard H/W Verified** |
|  | **Text** |  | **UserSignature** |
| NDL2 (POC 200) |  | Sign TCR when serial is verified on Loco  Results have been transferred when correct serial audited. |  |

## Programming Details

| **Table 40: NDL 2 Processor – Programming Details** | | | |
| --- | --- | --- | --- |
| **Software Item** | **Software Version / File Name** | **Installed By** | **Verified By** |
|  | **Text** | **UserSignature** | **UserSignature** |
| NDL2 image version |  |  |  |
| NDL2 loco specific configuration (loco ID) |  |  |  |

## Procedures

| **Table 41: NDL 2 Processor – Procedures** | | | |
| --- | --- | --- | --- |
| **Procedure** | **Expected Result** | **Signature** | **Notes** |
|  |  | **UserSignature** |  |
| Image & configure the NDL2 as per NDL2 Quick Configuration Lab Guide | SSD imaged and configured for loco ID |  | NDL 2 Image – 2.0 build 00 |
| Re-configure the NDL2 BIOS as per NDL2 Quick Configuration Lab Guide | BIOS power settings reconfigured |  |  |

| **Table 42: NDL 2 Quick Configuration Lab Guide** | | |
| --- | --- | --- |
| **Procedure** | **Signature** | **Notes** |
|  | **UserSignature** |  |
| Generic Software Configuration | | |
| Remove SSHD from the NDL. |  |  |
| Use HDD Raw to write the NDL2 image onto the SSHD. |  |  |
| Re-install the SSHD into the NDL2 processor. |  |  |
| Connect a keyboard & monitor into the NDL2. |  |  |
| Connect a 12V power supply into the NDL2 |  |  |
| Press the Power Button on the NDL2 |  |  |
| Access the BIOS during boot up by pressing F2 |  |  |
| Navigate to the POWER tab within the BIOS  On the “Power ON after Power Faliure” option, select the “S0-Power On” |  |  |
| Go to the “exit” Tab and save and close. |  |  |
| Remove the power to the NDL2 |  |  |
| Wait 10 seconds and re-apply the power. The NDL2 should now automatically power up without having to manually press the power button. If it has not started automatically started, check the BIOS setting has saved. |  |  |
| Loco Specific Software Configuration | | |
| Connect a Laptop into NDL2 eth port 0 (bottom port) |  |  |
| Create a Putty session to log into the NDL2   1. Laptop Network Settings:    1. VLAN: Untagged    2. IP: 10.255.255.107    3. Sub: 255.255.255.0 2. NDL2 Network Settings:    1. IP: 10.255.255.209    2. Sub: 255.255.255.0 3. Session:    1. SSH    2. Port 22    3. Username: pi    4. Password: admin12 |  |  |
| Once connected, type the following command to configure the NDL2 to the target locomotive.  configure\_loco <loco\_id>  Example: pi@ndl:~$ configure\_loco 8188 |  |  |
| Reboot the NDL by typing the following command:  sudo reboot |  |  |
| Verification | | |
| Connect a Laptop into NDL2 eth port 1 (top port) |  |  |
| Create a Putty session to log into the NDL2   1. Laptop Network Settings:    1. VLAN: VLAN 2    2. IP: 10.228.XX.XX (spare IP on NVIP plan)    3. Sub: 255.255.255.224 2. NDL2 Network Settings:    1. IP: 10.228.XX.XX (Next IP allocation on NVIP plan as per below)    2. Sub: 255.255.255.224 3. Session:    1. SSH    2. Port 22    3. Username: pi    4. Password: admin12 |  |  |
| Once connected verify the settings by typing the following commands:  Showndlver |  |  |
| Check the following properties:  Version 2.0 build 0  Correct Loco ID  HDD Partition Expanded  Ethernet adapter correct. – Eth1.2 = Loco Specific |  |  |
| Place an information tag on the NDL2 stating it has been successfully configured for loco XYZ and is ready to be installed on the locomotive. |  |  |

# VICS Subsystem (MDR-5R)

## Hardware Details

| **Table 43: VICS Subsystem – Hardware Details** | | | |
| --- | --- | --- | --- |
| **Hardware Item** | **Serial Number** | **Note** | **Onboard HW Verification** |
|  | **Text** |  | **UserSignature** |
| MDR-5R |  | Sign TCR when serial is verified on Loco  Results have been transferred when correct serial audited. |  |

## Programming Details

| **Table 44: VICS Subsystem – Programming Details** | | | |
| --- | --- | --- | --- |
| **Software Item** | **Software Version / File Name** | **Installed By** | **Verified By** |
|  | **Text** | **UserSignature** | **UserSignature** |
| VICS MDR-5R Firmware Version (MDR LCD Screen) |  |  |  |
| DVSS Server |  |  |  |
| DVSS Server Video Server |  |  |  |
| MDR-5R Full Computer Name |  |  |  |
| Camera configurations |  |  |  |
| FLTSettings |  |  |  |
| VEHSettings |  |  |  |
| SpeedToCollisionRequestParameters |  |  |  |

## Test Procedures

| **Table 45: VICS Subsystem – Test Procedures** | | | | |
| --- | --- | --- | --- | --- |
| **Procedure** | **Expected Result** | **Result** | **Signature** | **Transferable** |
|  |  | **Text** | **UserSignature** |  |
| Verify the MDR settings as per 90000505.E00.EN. (VICS Software Update Procedure) | As per 90000505.E00.EN. |  |  | **YES** |

# CF Status

## Hardware Details

| **Table 46: CF Status – Hardware Details** | | |
| --- | --- | --- |
| **Hardware Item** | **CF Card Details (Brand & Size)** | **Signature** |
|  | **Text** | **UserSignature** |
| ATO-N |  |  |
| ATO-R |  |  |
| DSE-N |  |  |
| DSE-R |  |  |
| ADL |  |  |
| MDR |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **AC - Commissioning - NIU II Lab Certificates - Signatures** | | | |
| **Name** | **Date** | **Comments** | **Signature** |
| %USERS.NAME% |  |  |  |