OnePass G3 (2016)

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Contents

1 Introduction

This manual applies to Nordco's 2016 model of the OnePass ultrasonic rail test equipment, which is designated by the assembly number 1103100, located on the serial number label next to the couplant tank.

This user's guide explains how to set-up, operate and troubleshoot the various components of the unit. It is assumed that the user is knowledgeable in the Nordco Rail Truck testing software and meets the requirements of the Federal Railroad Administration (FRA) to perform NDT testing on train rail.

1.1 OnePass at a Glance

This document includes a technical description of the OnePass ultrasonic rail test system manufactured by Nordco.

The highlights of the OnePass are many:

- Requires only one pass to assess the integrity of rail.
- There is no need to change transducers and re-test the same rail section.
- Utilizes the same proven wheel and digital signal processing technology as employed on the rail inspection trucks.
- Runs the same Windows 7 application software as deployed on Nordco's rail trucks, featuring optimizations for manual testing operations. This includes a rugged, wireless touch display notebook, auto scrolling B-Scan, touch friendly gate and gain controls, layouts for horizontal/vertical screen orientation and high contrast icons.
- Ultrasonic data can be displayed in an A-Scan, interactive B-Scan, Context view (Recognition Engine).
- The OnePass has been designed for use in a modern computer environment in which data-sharing is essential. U/T data ("tape") can easily be uploaded to Nordco's Smart Hub cloud service, exported to Microsoft Office tools, emailed (small file sizes) and archived to (and restored from) backup media.
- Geo tagging of equipment and test data.
- The OnePass is configured purely through software and does not include any physical configuration switches, links, etc.
- Features an integrated hand test kit and software application for single channel hand testing of defects.
- Availability of optional accessories for transportation, maintenance, battery charging and ergonomics. These include a stand for securely mounting the OnePass in service vehicles, an outrigger to better balance the OnePass when measuring long stretches of rail, a rain & sun shield, and an optional small tool case.

1.2 Overview

The OnePass ultrasonic rail test system is of modular design and consists of the following components and attributes:

- Getac F110 Windows Rugged Tablet, articulating tablet support with quick disconnect, the ultrasonic hardware module specifically designed for the OnePass, Wi-Fi router, 24V Li-Mn battery, smart couplant delivery system and the ergonomic, light weight design.
- Fully featured Rail Truck software, featuring a digitizer, A-scan, B-scan and context recognition of common defects and rail structure.
- Wheel Probe with an excellent signal-to-noise ratio and requiring no angle calibration. The specially designed wheel and axle has 11 transducers housed in the one axle.
- The lightweight and easily lifted assembly is suitable to be easily carried on and off test trucks and the rail.
- Comprehensive system documentation, including user's manuals and relevant technical documentation, in printed and electronic formats.

2 Safety Advice

2.1 Safety Guidelines

Failure to adhere to Safety precautions could result in bodily injury and/or property damage.

- It is necessary for all personnel and users to be aware of and familiar with the safety regulations included in this manual.
- It is also necessary for all personnel and users to be aware of and familiar with the safety regulations of the equipment to which the OnePass system is attached as well as those of any track or facility in which work is to be performed.
- All persons working on the OnePass system must comply with any applicable safety regulations.

2.2 Scope of Documentation

- The documentation included in this manual applies only to the portions of the OnePass system supplied by Nordco Rail Services.

- Where possible we mention references to possible safety hazards posed by other systems, but it is not the purpose of this documentation to note all hazards associated with the environment in which work will take place.

2.3 Safety Devices Guidelines

- Safety equipment must be in good, working condition.
- Safety equipment must be properly installed and functioning before running the OnePass system.
- Safety equipment must not be removed unless the system is stationary, appropriate procedures to ensure a safe working environment are followed, the OnePass system is turned off, appropriate signage is in place, and lockouts have been activated to ensure the OnePass system cannot be accidentally restarted.

2.3.1 List of Mechanical & Electrical Safety Devices

- All enclosure covers.
- Redundant bolting/fasteners.
- Wire ways, tie-downs, and cable covers.
- Electrical fuses.
- Placards and signage indicating possible dangers or ongoing maintenance.

2.4 Safety Equipment Guidelines

- Safety equipment must be clean and in good, working condition.
- Safety equipment must be worn/used whenever maintenance is to be performed on the OnePass system.
- Safety equipment must not be removed until all safety devices are properly installed and functioning.

2.4.1 List of Required Safety Equipment

- Safety glasses must be worn at all times when performing maintenance tasks.
- Ear protection must be worn as needed depending on the environment in which work is to be performed.
- Proper foot protection (specifically rubber-capped, steel-toed boots.)
- Proper-fitting protective garments are to be worn when performing maintenance activities.

3 Installation & Setup

3.1 What's in the box

1. OnePass Ultrasonic Rail Tester with RSU (not shown in illustration below)
2. Wireless Keyboard, Support Tray & Charger
3. OnePass Battery Charger (120V) & Spare 24V Battery (standard Li-Mn configuration shown)
4. Getac F110 Tablet (not shown in illustration below)
5. Power Cables (120V) for Getac F110 and Dual Bay Battery Charger
6. Dual Bay Battery Charger for Getac F110 Batteries
7. Spare Batteries for Getac F110 Tablet
8. 4 Foot Ethernet Cable
9. Getac F110 Tablet Vehicle Charger (12V)
10. OnePass Transport Wheels
11. Wheel Fill Gauge
12. Gallon Wheel Fluid
13. Wheel filler Pump with Handle
14. Push Handle Extenders
15. Cup / Couplant Holder
16. Guide Wheel Lock Kit
17. Kit with Small Spare Parts
18. Kit of Essential Tools
19. Hardcopy of the User's Manual
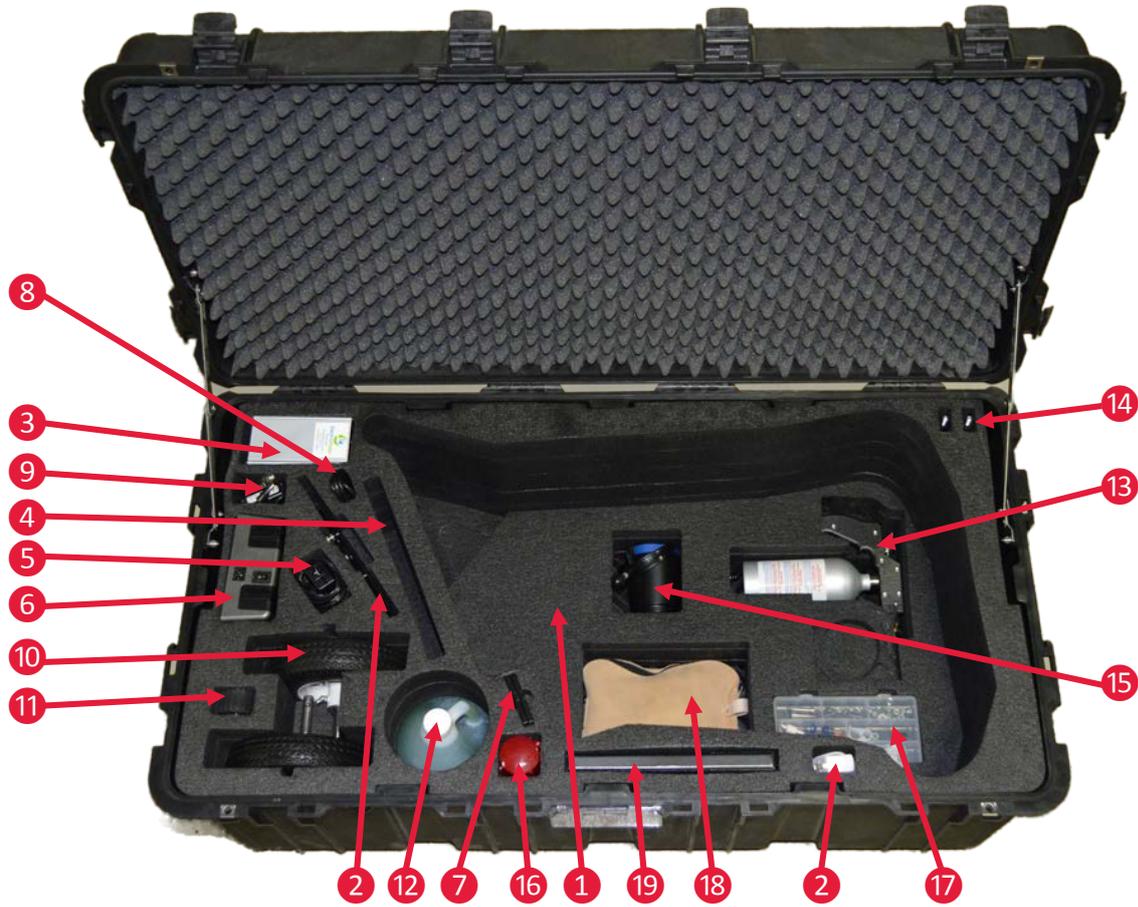
3.2 Battery

The OnePass battery must be installed in the compartment shown in the picture on the right. A nylon strap is fed through slots in the housing; it includes a clip (1) for securing the battery. Note, the battery connector (3) must be unplugged prior to battery removal.

The standard battery for the OnePass is a high capacity Li-Mn (Lithium-Manganese) battery. When shipping the OnePass or individual batteries always follow guidelines and transportation regulations for Li-Mn batteries. The battery is charged via the adapter (2). It may be charged while installed in the OnePass or when removed. A full charge should take about 2-3 hours.
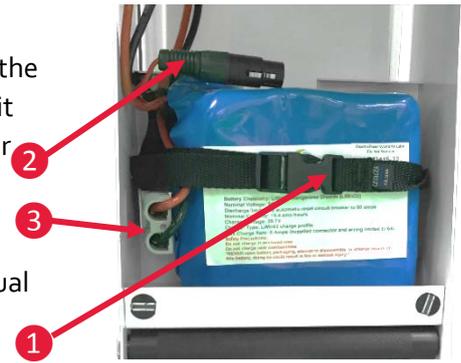
For testing applications that require air shipment of the OnePass, a Ni-Mh (Nickel-Metal Hydride) battery option is available (see image below and chech Accessories and Add-Ons List at the end of this manual for part numbers). To charge the Ni-Mh battery:

1. Plug in the twist-lock connector to the provided AC adapter.
2. The adapter's LED indicator will briefly turn green, then will change to red while the battery is charging.
3. Once the battery is charged, the LED will change back to green until it is unplugged; a full charge should take about 5-6 hours.

A microprocessor-controlled temperature- and voltage-driven sensor will automatically stop the Ni-Mh battery charging once it is fully charged. In case of sensor failure, there is a backup timer that will stop the battery charging after 8 hours. If the LED is blinking green, it means that either the thermistor has lost contact with the cell or the charger's polarities are reversed. Please note that unlike older models of Ni-Mh batteries, the cells do not need to fully discharge before charging again.

NOTE: The OnePass power supply electronics need to be factory-calibrated for the choosen battery option. Li-Mn and Ni-Mh batteries are not intechangable in the field. Installing the incorrect battery may cause damage to the OnePass electronics. Please contact Nordco Technical support if you need to change battery types so that we can coordinate re-programming of the power supply electronics.

Figure 1: OnePass Ni-Mh battery option, approved for air transportation.

3.3 System Setup

Once you arrive at the location to be tested, set the OnePass on a hard surface and follow these next steps:

1. When setup on rail, first engage the rail capture wheels by pushing down the levers in the rear of the OnePass. Then fold down and extend the two kickstands as needed to support the OnePass by

    pulling on the ends. One quarter turn is needed to loosen or fasten the leg extension. Be sure to tighten the leg extension sufficiently before the OnePass is supported on the kick stand legs.

2. If not installed, slide the OnePass battery into compartment located just in front of the water container. Slide battery in until unit is completely seated. Secure it with the strap and plug in the gray battery connector.

3. The Getac F110 Windows Rugged Tablet is attached to the OnePass with an articulated joint / pot mount. This allows the operator to orient the tablet at any desired angle in portrait or landscape screen mode. The grip on the right underside of the tablet holder features a slide latch to allow quick mounting/dismounting of the tablet. Securely snap the tablet into its holder and attach optional wireless keyboard tray as needed.

4. The Getac F110 tablet operates wirelessly so no further installation or hookup is required. In extreme heat operation, >90°F(32°C), it is recommended to use a wired Ethernet connection by attaching an Ethernet cable to the relevant port on the F110 and the Ethernet connector located below the DSP housing on the OnePass. Follow the instructions from section 3.5.4 to setup the wired connection on the tablet.

5. Attach push handle extenders and cup holder accessories as needed. For operation with keyboard tray it is recommended to attach the push handle extenders on the left and right side of the main handle.

6.   During sunny or rainy weather conditions attach the optional sun/rain shield by fastening the bracket with two thumb screws below the tablet holder. Snap the awning piece in the holes of the tablet gripping blocks.

7.   Fill the couplant tank located at the front of the OnePass frame with water or frost safe windshield washer fluid, depending on weather conditions. The container holds up to five US quarts of liquid.


Figure 2: Tank filler.

3.3.1 Guide Wheel Locking

The OnePass features a spring loaded rail capture mechanism that has been designed to support and guide the OnePass over 80-lb to 144-lb rail with varying degrees of wear and flow. This provides flexibility to test under many different rail conditions without the need to change setups.

To perform an effective test the operator needs to be skilled at balancing the OnePass over the rail at all times. We have found that productivity can be improved by fixing the spring loaded guide wheels when testing on rail with no (or very limited) flow and constant cross section.
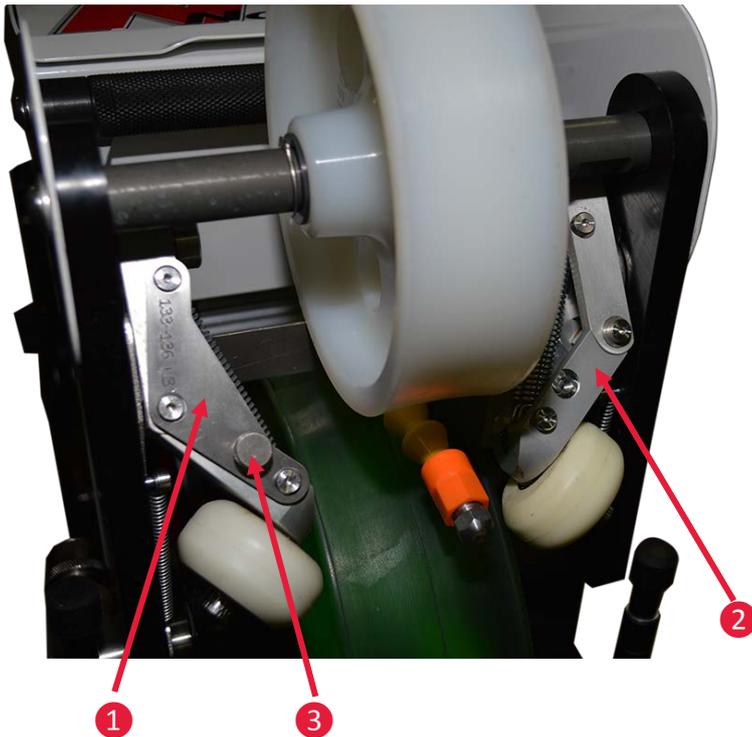
Guide wheel locking is archived by installing a lock plate (1) on the guide wheel assembly (2). Before installing the lock plate tip back the OnePass and rest it on a horizontal surface. Then place the locking plate for the type of rail to be tested over the bolt heads of the guide wheel arm assembly. To insert the last bolt head in the lock plate push the lower arm against the springs as needed. Then insert and securely tighten the thumb screw (3) as shown on the left guide arm in the picture. Repeat the process on the other guide arms as needed. Typically only the front guide wheels need to be locked.

3.4 Starting the OnePass System Software

With the OnePass system components installed on the frame, place the unit on the track to be tested and follow the next steps prior to testing.

1. Power on the OnePass by pressing the silver button located on the back side of the DSP unit. The indicator light located next to power button will cycle through green, orange & red two times during the system initialization, then the green light will flash indicating that the unit is turning on.
2. Power on the Getac F110 tablet by pressing the green POWER button on the tablet. Once the tablet is booted up, you will be prompted to enter the windows password. The password can be changed by the owner of the unit and is set initially to match the serial number of the OnePass, i.e. op011. A keyboard will appear on the screen and using the pen attached on the top of the tablet, tap the keys that represent your password and then tap the OK button.
3. Start the GPS software by clicking the blue Virtual-GPS icon on the desktop. Click the *Start V-GPS* button and wait for the *Signal Indicator* to report GPS signals. Minimize the Virtual-GPS window by clicking the *X* icon.
4. A red "N" icon for the Nordco Rail truck software is located on the desktop or windows quick start bar. Double tap it to open the software. You will be prompted for a password. This is a user created

password. Hold the pen over the password field and click on the keyboard image that appears. Using the pen, tap on the letters/numbers that make up your password and click the OK button.

5. Once the Nordco software header appears, wait for the message dialog stating "FULL SYSTEM REBOOT HAS OCCURRED" and then tap OK to dismiss the message. Note: This may take up to 60 seconds.

6. In the left side of the main toolbar tap on the gears icon to open the System Verification Test dialog. Tap on the button named *Parallel* once and then tap on the *Download & Done* button. The system will verify that the DSP unit is functioning, download all current job parameters and then close the System Verification Test dialog. Successful initialization is indicated by three green boxes for DSP 0-2.

7. Tap on the B-Scan icon located in the center of the main toolbar. This will display the B-Scan view.

8. Next tap on the Channel Parameters icon that is also located near the center of the software header. This will display the transducer parameter window.

9. Select the *Open NrsitScope* command under *SoftScope* in the main menu or with the scope icon. The digitizer (soft scope) window will open. Tap and drag the digitizer *power* button to the up position so the digitizer will start displaying signals.

10. You will see the soft scope screen and images. Tap on the left side of the soft scope window and reduce the window to approximately one third of the screen height. You will notice a thumb pin in the upper left corner of the window. Tap on the pin. This will pin it to the screen to overlay it on all other windows. You may want to reduce the soft scope window at this time to better view the B-Scan. We recommend you move the window over to hide the right side controls. This can be accomplished by taking the tablet pen and placing it on the left side of the digitizer window and having a double arrow appear. This will allow the user to move the digitizer window.

11. Now tap on the green milepost icon located in the main toolbar. A Set Location dialog will appear that will give the user the choice of changing the mile post number and to select *Ascending* or *Descending* test direction to follow the mile post in the field.

12. Now the operator is ready to start testing.

13. Note: Window arrangements can be saved as custom layouts by clicking *System Settings* under the *Edit* menu.

3.5 Advanced Setup

3.5.1 Encoder Setup

The OnePass features an optical encoder, which is integrated with the XL9-11RSU. Its purpose is to measure the traveled distance during rail inspection. In order to archive the correct scale factor it is critical to enter the appropriate value for *Calibration Counts*, which is **6.105**.

The Encoder Setup dialog is invoked via the *Edit* on the main menu bar.

Note that the calibration value is stored with each job file. Therefore after changing this value the job file must be saved.
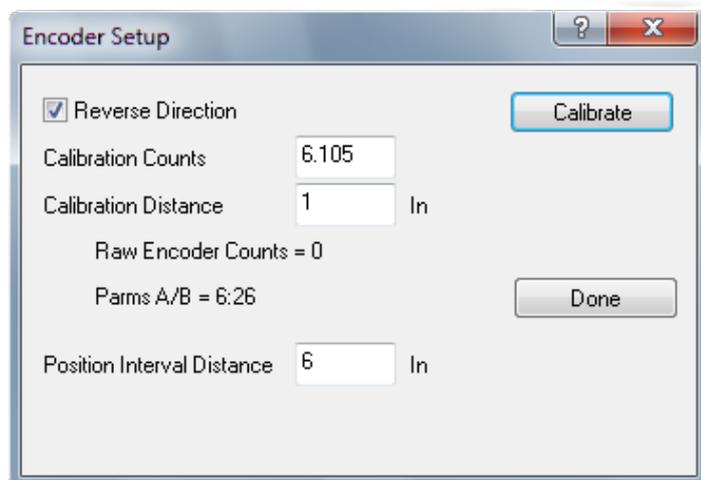
3.5.2 RSU Peaking

Peaking of the RSU is a critical setup process that ensures that all of the transducers are optimally oriented over the rail. A system with an improperly peaked RSU will be difficult to keep aligned over the rail during test because it will not have the required narrow band peak signals from the rail base in the first gate.

To prepare for this procedure follow the setup instructions in section 3.3 to step 3 and section 3.4 up to step 12.

1. Setup the OnePass vertically on a section of rail using the two kickstands or with the help of an assistant. Peaking can also be performed without the need for an assistant when the OnePass is secured in the OnePass vehicle.

2. Loosen (but do not remove) the 4 bolts (1) on the 2 RSU Axle Shaft Collars (indicated by arrows in the picture below) using a 3/16" Hex/Allen wrench.
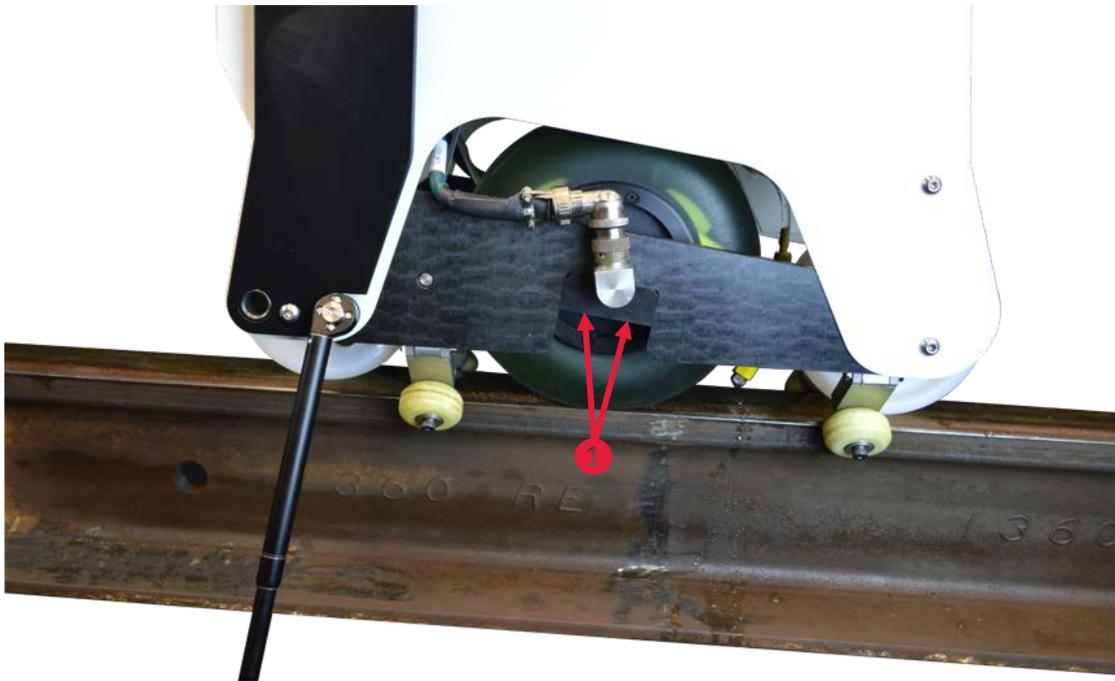
3. In the Channel Parameters window select the **oWB** channel.
   NOTE: Remove the tablet and put it on the ground to see the SoftScope while adjusting the wheel position.

4. Rotate the RSU axle using a 7/8" wrench until a maximum signal peak from the Back Wall Echo in the Wall Gate (gate 3) is archived (see picture below)
   NOTE: The gain values may need to be adjusted so that the Back Wall Echo is not saturated. If so **do not save** the Job.
   WARNING: Do not turn the Test Wheel shaft by grabbing the cable connections. Always turn the shaft by placing a wrench on to the flats of the shaft.

5.   Tighten the Axel Shaft Collars while looking at the SoftScope to verify the peak does not drop.

3.5.3 Enabling Audio Feedback

The Nordco Rail Truck software features a setting by which audible feedback can be enabled for certain events. Refer to the Rail Truck online help file for detailed setup instructions.

3.5.4 Changing between wired and wireless communication with the DSP

1.   Open the Windows Control panel and select Network and Sharing Center
2.   Select Change adapter settings, Look at the list of connections and right click on the connection you wish to change and select Properties page
3.   A dialog like shown in Figure 2 will appear, select the IPv4 item as shown and select Properties to invoke the dialog shown in Figure 3.
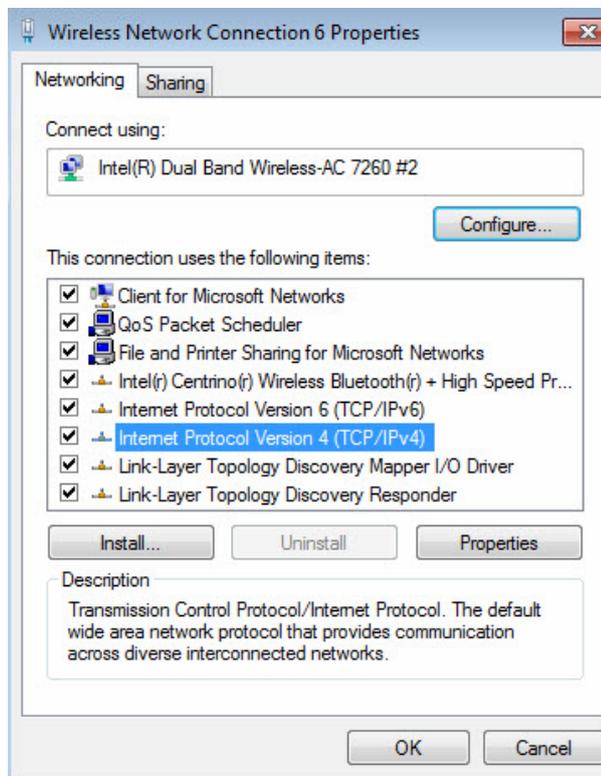

Figure 3: Windows Network Connection dialog.
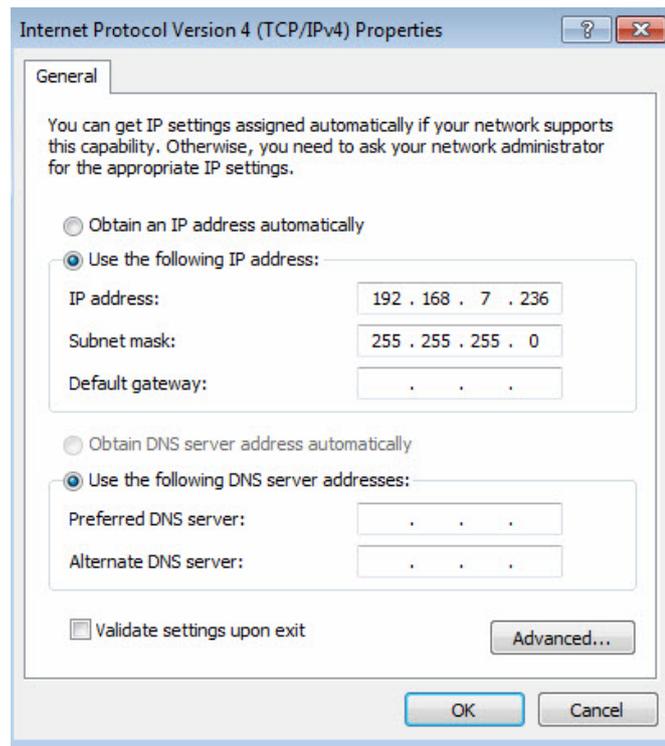
Figure 4: TCP/IP Properties dialog.

4. Set IP address to same settings as shown in Figure 3 above.
5. Changing connections, please disable the connection that you will not be using. Refer back to the Network list and click disable.
6. Click on the adapter that you want to use instead of the one previously disabled and enable to connection being used, select enable.
7. The same setting will be set with the IP address of **192.168.7.236** weather you use the Wireless adapter or the integrated Wired network adapter.
8. The only variable is that the connection not being used must be disabled before the settings of same IP address is required to be set.

4 Operation

4.1 Testing Rail

With the OnePass ready the operator can now push the unit in the direction needed to test the rail. Caution should be used when walking along the rail to ensure that the operator keeps proper safety technics and habits. Track beds may have tripping hazards, loose rocks, raised ties, steep inclines, rail traffic and other obstacles that require extra effort to perform an accurate test. A list of suggested testing methods are listed below:

1. Make sure that the side guiding wheels are properly in place prior to testing so the unit will not veer off to one side or the other.
2. Walk at a pace that is safe and constant. The operator should do his/her best to keep the OnePass at a 90 degree position on the track. This will ensure the unit will test properly.
3. The operator may want to walk to the side of the testing unit and use just one hand to push the OnePass along the rail or may find it easier to walk directly behind the unit using two hands. Either method will work.
4. Take care when removing the OnePass off the track once testing is complete.

4.1.1 Pausing a Test

While in testing mode you can pause the test to move the system off the rail temporarily. To do this you press the "PAUSE" icon ⏸ on the toolbar. During a test pause the system will be in the following state:

- The couplant pump is turned off.
- The encoder readings are ignored.
- Defect recognition is disabled (no defects are recorded).
- The test data file is still open but does not append records.

4.1.2 Testing in Extreme Temperatures

The normal operating temperature for the OnePass is between 20°F (-6°C) and 90°F (32°C). The extended operating temperature is between 5°F (-15°C) and 100°F (38°C). Please follow the best practices guidelines listed below if temperatures fall within extended operating ranges.

- When operating in extreme heat, 90° to 100°F (32° to 38°C):
  - The OnePass must be equipped with a top mounted air intake. Please note that earlier models may not have this and need to be factory retrofitted.
  - Ensure that DSP cabinet filters are clean prior to each shift.
  - Switch to a wired Ethernet connection between the OnePass and the F110 tablet if you notice unusual communication errors during rail testing.
  - During operator breaks turn off the OnePass and move the unit in a shaded, ideally air conditioned area (i.e. OnePass service vehicle) if possible. This allows the electronics to cool down and conserves battery power.
- When operating in extreme cold, 5° to 20°F (-15° to -6°C):
  - DO NOT store the OnePass in temperatures below 5°F (-15°C). This can cause problems with the battery, and the OnePass may fail to start after cold storage. Instead, keep the unit in a heated area (i.e. a hotel room or the OnePass service vehicle) if possible.

4.2 SmartFlow - Automatic Couplant Delivery

The OnePass unit is equipped with Nordco's SmartFlow technology, which automatically applies the appropriate amount of couplant fluid to the rail surface. The SmartFlow feature is controlled via the Rail

Truck software *Pump Flow Control* dialog box, illustrated below. The dialog is accessed from the views menu or via the "SMARTFLOW" icon ▶ on the main menu toolbar.
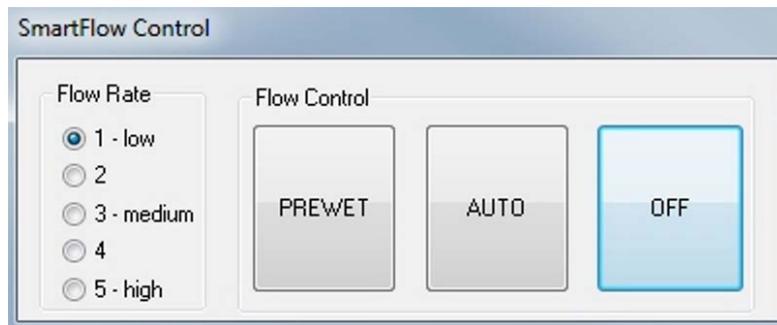

The *SmartFlow Control* dialog box contains two groups of controls, labeled *Flow Rate* and *Flow Control*. *Flow Rate* controls comprise a single group of radio buttons, labeled 1 through 5. These correspond to various pre-configured flow rates ranging from least flow to greatest flow. *Flow Control* comprises a set of four buttons, labeled *PREWET*, *AUTO* and *OFF*. The functions and interactions of these buttons are listed below:

1. **PREWET** automatically generates a five second burst of full flow at the beginning of a test, then reverts to auto mode at flow rate 1 (minimum flow rate). This burst occurs independently of the dialog and of any setting in the registry.
2. **AUTO** In auto mode couplant is automatically applied to the rail during a test as soon as the OnePass is moved; couplant flow is stopped when the OnePass comes to a rest.
3. **OFF** turns off water flow.

When a flow rate and control setting is selected, they are saved into the computer's registry, and are reloaded when the *SmartFlow Control* dialog is opened again.

If the test application requirement exceeds the settings range in the software the user can switch to a spray nozzle with more or less flow capacity. The OnePass is supplied with three nozzle types having different flow rates. The nozzles are marked with an "M" number indicating how much water is released over the span of an hour at nominal pressure.

M2 1.26 GPH
M4 2.53 GPH
M10 6.32 GPH
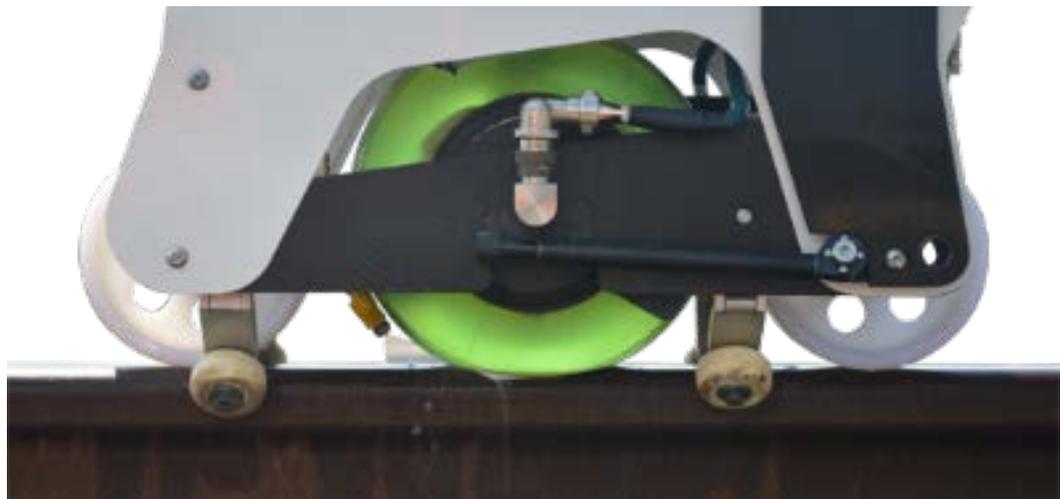
4.3 Removing the OnePass from the Rail and System Shut-Down

Once testing has been completed follow the next steps to ensure proper shutdown and disassembly of the OnePass unit:

1. Tap on the red circle stop icon ⬤ at the main menu bar to stop the current test.
2. Tap to slide the green Power button on the NrsitScope window. This will turn off the digitizer window.
3. Next open the Movement dialog box using the ☰ icon from the main menu. Follow the necessary steps to create reports and to upload or archive test data.
4. Once your reports have been created, printed and saved you may log off the operator and then close the software.
5. Power down the OnePass by pressing the silver button on the back of the OnePass unit until the light goes out. This indicates that the OnePass is turned off.
6. The operator may elect to keep all the components of the OnePass on the frame or may choose to remove them as needed. If the operator chooses to remove the tablet, battery and the DSP unit, just reverse relevant steps from the section 3.3 in this manual.
7. The operator must make sure to charge the Lithium-Manganese OnePass batteries and the Getac Tablet batteries at the end of each day to ensure proper performance each day.

5 Preventive Maintenance

5.1 Battery Recharging

The OnePass 24V Li-Mn battery has the capacity to perform rail testing for up to 5 hours without recharging. It is recommended that the battery is recharged during breaks, in which case an entire shift of testing is possible without replacing the battery.

To recharge the OnePass battery you need to **shut down the DSP,** but you don't need to remove or disconnect the battery from the OnePass. Please ensure that the **charger unit is turned off prior to plugging in** the battery charger connector. Once the charger is plugged into the battery turn it on by connecting it to a power source. A full recharge typically takes about 2 to 3 hours.

It is highly recommended to fully recharge the battery prior to each shift and to have a fully charged spare battery available.

5.2 Indicator Light

The OnePass system is equipped with a multi-color indicator light on the rear of the unit next to the power button. The following table lists the meaning of the indicator light and actions that the software will take.

Indicator Light	Temperature on Digital Processor	Cooling Fan Status
LED Blinks Green	< 100 Degrees F, Normal Temperature	Fans off
LED Blinks Green	> 125 Degrees F, High Temperature	Fan 1 On, warning sent to DSP
LED Blinks Orange	> 135 Degrees F, High2 Temperature	Fan 2 On, warning sent to DSP
LED Blinks Red	> 150 Degrees F, High3 Temperature	Fans 1 & 2 On, Warning sent to DSP
LED Blinks Red	> 160 Degrees F, High4 Temperature	Fans 1 & 2 On, Error sent to DSP
LED Blinks Rapid Red	> 170 Degrees F, High5 Temperature	System Shuts down

Table 1: Indicator Light codes.

5.3 Required Tools

The following lists of tools is needed for performing minor repair and preventive maintenance tasks.

- An English Allen Wrench set is needed to perform operations. The exterior bolts either use 5/32, 1/8 or 3/16 Allen keys. An angled set works well for most operations. It is also recommended to have a straight 5/23 Allen Key with extension that is at least 15" (380 mm) long for easy access to the DSP mounting screws.
- A 3mm metric Allen key and small adjustable crescent wrench needed to replace electronics boards.
- Small flat pliers are needed for removal and installation of e-clips

5.4 Daily Maintenance

5.4.1 The following items need to be checked prior to each shift

- Ensure that all DSP filters are clean.
- Ensure that the wheel pressure in the Ultrasonic wheel is set at 3lbs.
- Ensure that the Ultrasonic wheel is properly peaked. This is critical for obtaining clean base signal peaks during testing.
- Ensure that all batteries are fully charged.
- Check mechanical connections to ensure that no parts have become loose.
- Check the guide wheels and springs for signs of excessive wear.
- Fill the couplant tank with the required amount of couplant fluid for the test. **During the cold season**, when temperatures dip below freezing during the day or overnight, please ensure that an approved freeze free couplant fluid (i.e. -40°F windshield washer fluid) is used to ensure that the couplant lines, pump and tank don't freeze up.

5.4.2 The following steps need to be performed after each shift

- Drain excess couplant fluid if the OnePass will be stored or shipped in non-vertical orientation.
- Wipe down the exterior of the OnePass with a soft cloth.
- Clean the RSU, guide wheels and nylon wheels.
- Check the guide wheels and springs for signs of excessive wear.
- Recharge the batteries for the OnePass, F110 tablet and wireless keyboard.

5.5 Monthly Maintenance

Nordco recommends to inspect and replace the following items as needed on a monthly basis to ensure a fully functioning OnePass system at the highest possible up-time. Part numbers for replacement parts are listed in the spare parts section of this manual.

- Replace DSP filters if needed.
- Replace guide wheel springs and kryptine guide wheels if they show excessive wear.
- Check the ultrasonic wheel for excessive wear and replace the membrane if necessary.
- Remove the couplant spray nozzle. Clean the spray orifice or install a new nozzle as needed.

6 Troubleshooting

Issue	Repair Option 1	Repair Option 2	Repair Option 3
Tablet will not come on	Battery needs to be charged.		
No couplant is applied to the rail	Fill water container with water. Open *SmartFlow Control* dialog box and press *PREWET* button.	Antifreeze may be required due to weather conditions.	Verify water spray nozzle is not clogged
RailTruck software will not connect to DSP.	Wired Operation: Make sure the Ethernet cable is connected to F110 and wired Ethernet configuration is selected.	Wireless Operation: Make sure the Ethernet cable is connected to router and wireless configuration is selected.	
Digitizer does not display	Tap on digitizer icon on the main menu bar.	Run parallel test to ensure communication between DSP and F110.	
An orange or red light flashing on DSP.	This is an indication of possible overheating. You may need to turn off the DSP for a while to allow cool down.		
A red light is fast flashing on the DSP.	The DSP unit is about to shut down immediately to protect itself because the maximum heat specification has been reached.	(A WARNING window will appear on the F110 screen informing the user that the DSP is experiencing an overheating issue.)	
Indications will not appear on the B-Scan	Verify that the RSU wheel has not lost fluid due to hole or other issues.	Verify that the cable connected to the RSU is properly connected.	
System Verification Test window continues to appear after tapping on *Parallel* and *Download and Done*	Go through the process once again to see if it will download properly.	Turn the DSP unit off and restart to see if the process will work.	Check communication setup between DSP and F110. Use wired Ethernet connection if external temperature exceeds 90°F.

7 Customer Service & Spare Parts

For parts ordering please contact Diana Hretz at Nordco, Beacon Falls CT, (203) 438-9696 x220.

7.1 High-Uptime Spare Parts

In order to avoid lengthy service disruptions, insuring the highest possible uptime performance for the OnePass we recommend to stock the items listed in the following table at the quantities shown.

Item Number	Description	QTY	U/M
1102865	Ethernet Cable, 4 ft, Black	1	EA
4000005	9 inch RSU Membrane	1	EA
1102016	RSU Wheel Mount Clamp	1	EA
1000545	RSU Fluid	1	GL
1000671	47mm Kryptane Guide Wheels	4	EA
1102821	3/8" Wire Spring for Guide Wheels	8	EA
1102214	1.26 GPH, 60 Min Nozzle	1	EA
1102226	6.32 GPH, 15 Min Nozzle	1	EA
1102227	2.53 GPH, 30 Min Nozzle	1	EA
1102466	DSP Filter Kit	1	EA
1102470	Water Pump & Hose Kit	1	EA
1102258	Kickstand, Left	1	EA
1103231	Kickstand, Right	1	EA
1102011	Pivot Link Assembly, Left	1	EA
1102012	Pivot Link Assembly, Right	1	EA
1102545	¼" Wire Spring for Guide Wheel Pivot Link	2	EA
1102328	Latch for Tablet Holder	1	EA

7.2 Standard Spare Parts

The following table lists common wear and spare parts for the OnePass in recommended quantities.

Item Number	Description	QTY	U/M
1102750	OnePass G3, Small Spare Parts Kit	1	EA
1102751	OnePass G3, Tool Kit	1	EA
1100311	RSU (complete assembly)	1	EA
1102237	Encoder Assembly	1	EA
1102247	OnePass Li-Mn Battery – 24V 15AH – Ground Shipping Only	1	EA
1103250	OnePass Ni-Mh Battery – 24V 13AH – Air Shippable	1	EA
1102230	F110 Tablet Battery	2	EA
1101771	6 inch, Nylon Rail Wheel	2	EA
1102213	Polyurethane Transport Wheel	1	EA
1102047	Extension Handle	2	EA
1103085	Cushioned Covers for Extension Handles	2	EA
1102038	Hood Cover	1	EA
1102216	Water Tank	1	EA
1102435	Water Pump (no hoses)	1	EA
1102330	Tablet Holder	1	EA
1102336	Tablet Knob	1	EA
1102229	Wireless Bluetooth Keyboard	1	EA
1103179	Guide Wheel Lock Kit (8 plates, 4 thumb screws & container)	1	EA
1102914	Guide Wheel Lock Plate, 80-90 lb rail	2	EA
1102916	Guide Wheel Lock Plate, 100 lb rail	2	EA
1102915	Guide Wheel Lock Plate, 133-136 lb rail	2	EA
1102917	Guide Wheel Lock Plate, 141 lb rail	2	EA
1103183	Thumb Screw for Tablet Accessories & Lock Plates (10-32 x 3/8")	2	EA
1102536	Bumper for Kickstand Leg	1	EA
1103397	Screen Protector, Tablet, Getac F110	1	EA

7.3 Accessories and Add-Ons

The items listed in the following table are optional accessories and add-ons for the OnePass.

Item Number	Description	QTY	U/M
1103101	Outrigger for improved efficiency during long tests	1	EA
1103102	Telescoping Kickstand with Magnet (included in 1103101)	1	EA
1102990	Tablet Shield for Rain and Sun Protection	1	EA
1102930	Vehicle Transport and Peaking Bracket	1	EA
1102329	Small Pelican Case for OnePass Components	1	EA
1103250	OnePass Ni-Mh Battery – 24V 13AH – Air Shippable	1	EA
1103245	OnePass Charger, 24V, Ni-Mh and Ni-Cad	1	EA

8 References

8.1 Nordco Documentation

- 1103100 OnePass Top Level Assembly
- 1103220 OnePass Body Assembly
- 1103060 OnePass Wheel Frame Assembly
- 1103064 OnePass Wheel Mount Plate Assembly
- 1102746 OnePass Transport Wheel Assembly
- 1102511 OnePass Hand Test Kit
- 1102375 OnePass Wiring

8.2 Equipment Manuals

- Getac F110 English Manual
- Tp-Link WR702N Users Guide