



Maintenance Manual
for the
UxValidator Instrument Display System Line Test Set
PN 06-0125-65



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Rev 1, 22 Oct 2010



Direct All Inquiries To:

ULTRAX Aerospace, Inc.
4200 NE Sun Court
Lee's Summit, MO 64064

www.ultraxinc.com
Phone (816)-214-9999
Fax (816)-214-9998

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- Fill out and mail the Recommended Changes to Technical Publications form at the end of this manual.
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Revision Status Page

This is the original issue, Revision 1, of ULTRAX Technical Manual PN 07-0601-02, dated 22 Oct 2010:

Maintenance Manual for the UxValidator Instrument Display System Line Test Set, PN 06-0125-65

MANUAL REVISIONS:

Dates of issue for the original manual and any revisions are:

Revision	Date of Issue
1 – Original Issue	22 Oct 2010

LIST OF EFFECTIVE PAGES:

The total number of pages is 64.

Page	Revision	Changes Made
1 through 64	1	NONE – Original Issue

For changes to text: The portion of the text affected by the latest change is indicated by a vertical line in the outer margin of the page.

For changes to illustrations: Changes are indicated by a vertical line in the outer margin of the page next to the title of the illustration, and a hand pointing to the changed area on the illustration.

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5

Safety steps to follow if someone is the victim of electrical shock

1

Do not try to pull or grab the person.

2

If possible, turn off the electrical power.

3

If you cannot turn off the electrical power, then pull, push, or lift the person to safety using a wooden pole, a rope, or some other insulating material.

4

Send for help as soon as possible.

5

When the injured person is no longer in contact with the source of electrical shock, move the person a short distance away and immediately start resuscitation.

FIRST AID

Refer to FM 21-11.

Warnings, Cautions, and Notes

WARNING

WARNING indicates a procedure, practice, condition, or statement that must be strictly observed. Failure to observe a WARNING could result in injury or death.

CAUTION

CAUTION indicates a procedure, practice, condition, or statement that must be strictly observed. Failure to observe a CAUTION could result in damage to equipment, loss of mission effectiveness, or long-term health hazards.

NOTE

NOTE indicates additional related information that is helpful or otherwise significant.



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1.0 General Information

1.1 Scope

This manual describes physical characteristics, and theory of operation of the UxValidator Instrument Display System (IDS) Line Test Set, PN 06-0125-65 (also referred to as the IDS Set in this manual). It also contains maintenance information for organizational and intermediate maintenance; it does not address depot-level maintenance. The manual also contains the Repair Parts and Special Tools List (RPSTL) for the IDS Set.

Information on using the IDS Set to troubleshoot the instrument display system on UH60 helicopters is found in ULTRAX Technical Manual PN 07-0601-01, CTS to WP 008900 of TM 1-1520-237-23.

1.2 Preparation for Use or Shipment

The UxValidator IDS Line Test Set is shipped and stored in a yellow transit case. It requires no special set-up or assembly before use. No special packaging or preparation is required for shipment.

1.3 Corrosion Prevention and Control

Corrosion Prevention and Control (CPC) is a continuing concern. It is important that any corrosion problems with this equipment be reported so that the problem can be corrected and improvements can be made to prevent the problem in the future. Therefore, if you notice corrosion or any other type of equipment degradation, fill out a Product Quality Deficiency Report, SF Form 368 (available at the ULTRAX website). Send it to ULTRAX Aerospace Inc., 4200 NE Sun Court, Lee's Summit, Missouri 64064.

1.4 Administrative Storage

Administrative storage of equipment issued to and used by the military will have Preventive Maintenance Checks and Services performed before storing. When removing the equipment from administrative storage, the Preventive Maintenance Checks and Services should again be performed. See Section 5.2 on page 49.

1.5 Warranty Information

The UxValidator IDS Line Test Set is under warranty for 410 days from the date of receipt. Report all defects to your supervisor, who will take appropriate action.

1.6 Quality of Material

Material used for replacement, repair, or modification of this equipment must meet the requirements of this manual. If quality-of-material requirements are not stated in this manual, the material must meet the requirements of the drawings, standards, specifications, or approved engineering change proposals that apply to the equipment.

1.7 Safety Care and Handling



The UxValidator IDS Line Test Set contains parts and assemblies that can be damaged by electrostatic discharge (ESD). Handle according to MIL-HDBK-263B.

1.8 Calibration

The UxValidator IDS Line Test Set must be calibrated annually. Refer to Calibration on page 33.

2.0 Equipment Description

The UxValidator IDS Line Test Set is used to troubleshoot the instrument display system in the aircraft. Together with an UxValidator, the IDS Set enables the technician to provide simulated signals to the instrument display system and then monitor the resulting signals coming back to the troubleshooting set. Based on the stimulus provided and the resulting outputs, the technician can determine whether a component is functioning properly or not.

The IDS Set connects to the aircraft instrument display system through two high speed data cables and two pods, all of which are included in the set. The UxValidator (not included in the IDS Set) provides interface and power for the test set and the display for the user.

2.1 Parts List

A list of the parts in IDS Set is given in the table below, followed by an illustration of the parts.

Table 2-1 – UxValidator IDS Line Test Set

Item	Description	Part Number	Qty
1	IDS BrainPak	06-0105-85	1
2	IDS Pod	07-0210-02	2
3	5' Hi-Speed Data Cable	08-0412-04	2
4	4' Temperature Probe Harness	08-0707-01	1
5	IDS Self-test Harness	09-1204-19	1
6	Transit Case	09-0113-05	1
7	Maintenance Manual	07-0601-02	1
8	User's Manual	07-0601-01	1

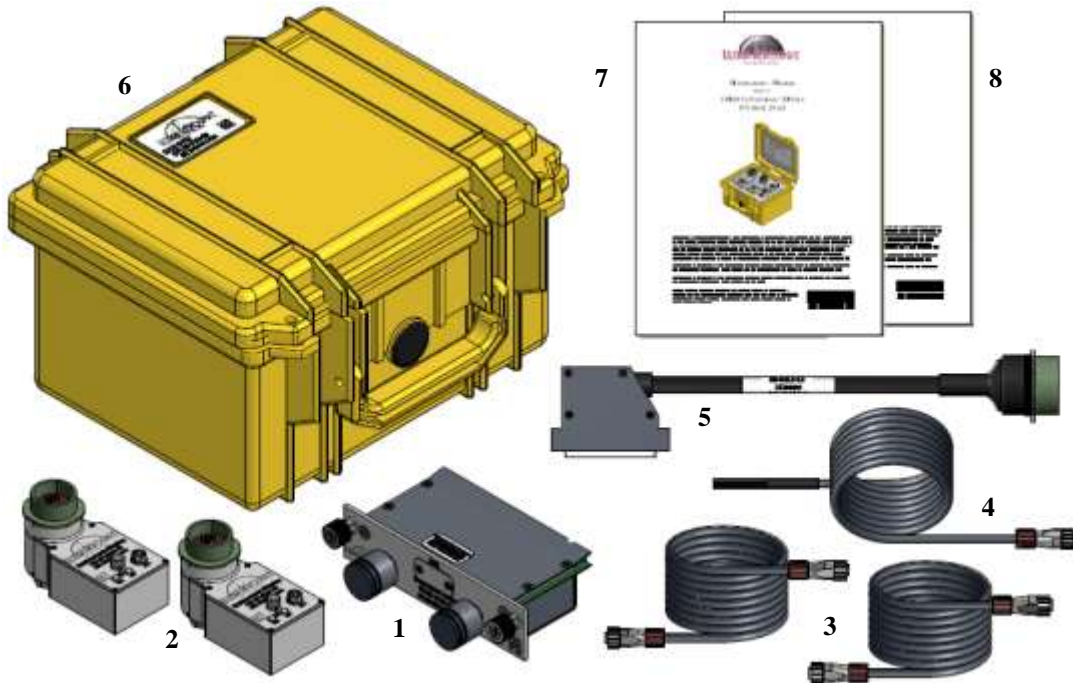


Figure 2-1 – UxValidator IDS Line Test Set PN 06-0125-65

2.2 Description of Components

Item 1 – BrainPak

The BrainPak is a removable hardware cartridge that contains the system’s programming. The user directs system operation via the BrainPak’s left and right Encoder knobs.

Item 2 – Pods

The IDS Pods are the physical and electrical interface between the instrument display system and the IDS Set. They are controlled by the BrainPak.

Item 3 – Hi-Speed Data Cables

These cables connect the UxValidator to the data ports of the pods.

Items 4 – Temperature Probe Harness

This cable is used to monitor the temperature near the SDC during testing. It connects to a B data port on the UxValidator.

Item 5 – Self-test Harness

This harness connects between the IDS Pod and the UxValidator during pod self-test.

Item 6 – Transit Case

The IDS Set is provided in a transit case that houses the set’s components. The set’s serial number and part number are located on the data plate, which is mounted on the cover of the transit case.

Item 7 – Maintenance Manual

A copy of this manual is provided with this set. An on-line version (in PDF format) is available at the ULTRAX website.

Items 8 – User’s Manual

A copy of this manual is provided with this set. An on-line version (in PDF format) is available at the ULTRAX website.

Not Shown – IDS Service Pack Application

The 06-0125-65 IDS Service Pack Application is used for test set maintenance. It contains the programming for test set calibration and for firmware updates. This software is normally provided via the ULTRAX website.

2.3 Equipment Data

The following table lists the physical characteristics of the UxValidator IDS Line Test Set.

Table 2-2 – Physical Characteristics

Input Power	
DC Voltage	18 to 36 VDC, <1.5A
Dimensions (L x W x H, in inches)	
Pod	3.2 x 4.6 x 2.25
BrainPak	4.75 x 1.2 x 3.0
Transit Case	10.7 x 9.7 x 6.9
Weight	
Pod	0.85 lbs
BrainPak	.30 lbs
Transit Case, full, with standard equipment	6.2 lbs

2.4 Unpacking the Equipment

When you receive the IDS Set, inspect the equipment for damage that occurred during shipment. If the equipment has been damaged, immediately report the damage to ULTRAX at 816-214-9999.

2.5 Checking the Equipment

Check the equipment in the set against the component list and the packing slip to see if the shipment is complete. The equipment can be placed in service even if a minor assembly or part is missing. However, if any of the equipment is missing, immediately notify ULTRAX at 816-214-9999.

2.6 Additional Equipment Needed

In addition to the components of the IDS Set, the technician also needs an UxValidator and an IBM-compatible PC.

1. The UxValidator

An UxValidator is needed to operate the IDS Set, but it is not part of the set. Either a Series I or Series II UxValidator can be used.

A. Series I UxValidator, PN 03-1217-02:

To be used with the IDS Set, a Series I UxValidator must have several additional components, all of which are included in the Series I Pod Adapter Set, PN 10-0210-01. The Series I Pod Adapter Set makes it possible to use a Series I UxValidator with a many of the ULTRAX specific troubleshooting sets.

Refer to the Series I Pod Adapter Set Maintenance Manual, PN 10-0210-19, for further information about using the Series I UxValidator with an ULTRAX troubleshooting set.

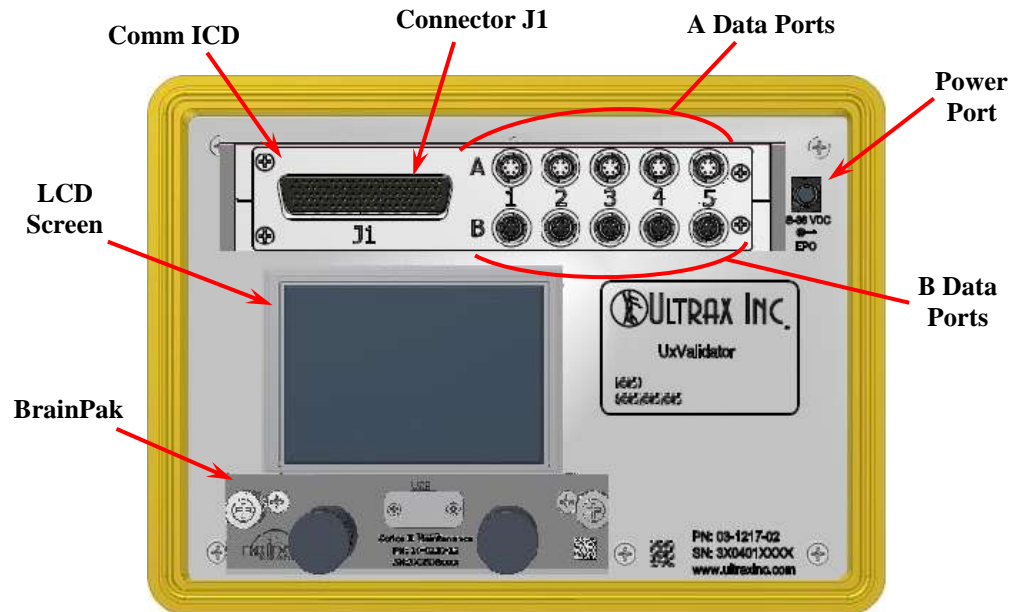


Figure 2-2 – Series I UxValidator Chassis with BrainPak and Comm ICD

B. Series II UxValidator, PN 08-0911-02:

The Series II UxValidator Set contains both the UxValidator and the other needed components, and can be used with many of the ULTRAX specific troubleshooting sets.

Refer to the Series II UxValidator Set Maintenance Manual, PN 10-0210-17, for further information about the Series II UxValidator and the other components in the set.

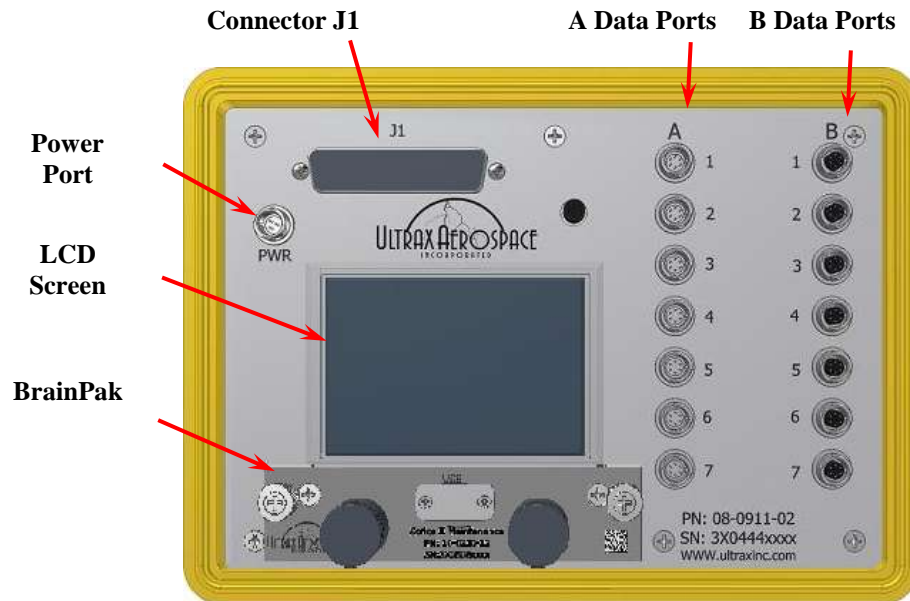


Figure 2-3 – Series II UxValidator Chassis with BrainPak

The UxValidator chassis is a key component in an UxValidator troubleshooting system:

- It houses the LCD Display.
- The BrainPak is installed into the chassis.
- System power is typically provided through the chassis's power port.
- The chassis provides physical connections to the pods and other components via J1 and the A and B Data Ports.

Power is applied to the UxValidator power port. During aircraft testing, 28Vdc aircraft power is normally supplied through the 28V Power Supply cable (24V/1.5A DC). When updating firmware, the AC power adapter cable is typically used. If power is removed while the UxValidator is running, the UxValidator will immediately shut down and all outputs will turn off.

2. IBM-compatible PC (not provided in the IDS Set)

The PC stores and runs the IDS Service Pack Application, which is used to calibrate the pods and update firmware on the set. During these procedures, the PC is connected to the BrainPak via an ULTRAX USB cable.

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3.0 Theory of Operation

The UxValidator IDS Line Test Set is used to troubleshoot the instrument display system on the UH60 Helicopter. The IDS Set enables the technician to provide simulated signals to the instrument display system components, and then monitor the resulting signals coming back to the troubleshooting set. Based on the stimulus provided and the resulting outputs, the technician can determine whether a certain component is working properly or not.

The IDS Set, the UxValidator, and the IBM-compatible PC work together as follows:

- The IDS BrainPak directs the operation of the IDS Set and the UxValidator. It communicates with the IDS Pod through data ports on the UxValidator and the hi-speed data cables. Operator inputs are applied using the BrainPak's encoder knobs, and directions and results are displayed on the UxValidator's LCD screen.
- The pods receive and implement the BrainPak's instructions, acquiring instrument display system information from the SDCs' J1 connectors.
- System status, measurements, and other results are returned from the pods through the UxValidator chassis to the BrainPak.
- The BrainPak processes this returning information and displays the results on the UxValidator's LCD screen. It then directs additional steps as appropriate or waits for additional operator inputs.
- The BrainPak also contains the programming for the IDS Self-test.
- The PC is used to run the IDS Service Pack Manager, which is loaded on a PC. The PC communicates with the IDS Set via a USB cable connected to the BrainPak's USB port.

3.1 IDS Pods

The pod is a very active part of the IDS Set. Controlled by the BrainPak, the pod internally sets up the configurations for exercising the instrument display system, and then measures and returns the results to the BrainPak.

During operation of the IDS Set, the IDS Pods are connected in between J1 of the Pilot's and Copilot's SDCs and the respective J1 harnesses, and are connected to the UxValidator via the Hi-Speed Data Cables. During the various maintenance procedures, the pods are connected to the UxValidator through the Hi-Speed Data Cables and, during Self-test, through the IDS Self-test Harness.

Turn the pod on by pushing the power switch toward the PWR lamp until the lamp turns on. Turn the pod off by pushing the power switch away from the PWR lamp until the lamp turns off.

3.2 IDS BrainPak

The BrainPak contains the software program for operating the IDS Set; it is the "brain" of the UxValidator. The BrainPak *receives* inputs and commands from the user via the Encoder knobs. It *processes* these inputs according to its program. It then *directs* the UxValidator and the other components of the troubleshooting set (through J1 and data ports) to execute the appropriate commands. The troubleshooting set components follow these commands

(make or break connections, simulate conditions, read results, etc.). The BrainPak *retrieves* the results, and it *evaluates* and *reports* them according to the user inputs and the software program.

These processes are executed quickly and accurately, giving the user rapid access to the information needed to accomplish the task at hand.



Figure 3-1 – BrainPak Physical Description

3.2.1 BrainPak Encoder Knobs

The BrainPak has two encoder knobs, referred to as the Left Encoder knob and the Right Encoder knob. The knobs are connected to 16-position switches that can be turned continuously in either direction. Raised rings encircling the knob provide positive grip so that the operator can easily feel the detent stops. Each Encoder knob is also connected to a pressure-activated switch; the switch provides positive feedback with a click that can be felt and heard.

The user navigates through the UxValidator menus, makes adjustments, and performs other actions via the BrainPak’s Encoder knobs. The knobs are operated by turning, pressing, or turning while pressing; more specific instructions are given later in the manual.

3.2.2 BrainPak Installation and Removal

To ensure long life of the BrainPak, follow these installation and removal steps.

CAUTION

The BrainPak contains parts and assemblies that can be damaged by electrostatic discharge (ESD). Handle according to MIL-HDBK-263B.

1. Installation

- A. Remove power from the UxValidator, if not already done.
- B. Retrieve the BrainPak from the Transit Case.

CAUTION

Do not touch the exposed connector on the bottom of the BrainPak.

- C. Align the BrainPak CCA with the card slot grooves in the UxValidator chassis.

- D. Gently press the BrainPak into the chassis until the Motherboard connector and BrainPak connector begin to engage.

CAUTION

Do not install the BrainPak by pushing on the Encoder knobs.

- E. Applying pressure to the BrainPak's faceplate, firmly press the BrainPak into the chassis to fully seat the connectors.
- F. Tighten the captive screws with firm fingertip pressure. Do not use excessive force or tools to tighten the screws.

2. Removal

- A. Remove power from the UxValidator.
- B. Loosen both captive screws until they spin with little force and rise and fall on their spring shaft.
- C. Pull the BrainPak free of the chassis by pulling up on the captive screw knobs. If the BrainPak does not unseat, the captive screws have not been loosened enough.

CAUTION

Do not remove the BrainPak by pulling on the Encoder knobs.

- D. Store the BrainPak in its proper slot in the Transit Case.

3.2.3 BrainPak USB Port

The USB port (normally covered) on the BrainPak is connected to a computer during firmware updates and alignment. Access the USB port by removing the two screws that secure the USB port cover.

3.3 IDS Service Pack Application

The 06-0125-65 IDS Service Pack Application (IDS Service Pack) is used to maintain the IDS Set. To that end, it has programming for checking and updating firmware and for alignments.

The original service pack application and later updates are provided through the ULTRAX website; refer to the instructions in Section 4.2 on page 27.

The IDS Service Pack interfaces with the UxValidator and any attached pods via the computer's USB port. The PC system requirements for running the service pack are:

- Windows 2000 / Windows XP
- Microsoft .NET Framework 3.5 or higher (Available for free from www.microsoft.com)
- One available USB 1.1 or higher port
- Administrative rights for installation

As noted above, to run the service pack, the PC needs a feature of Windows called the Microsoft .NET Framework. The ULTRAX website download page will detect and report if this software is present on your computer. You must also have administrative rights to your computer and have the rights to install a USB device driver. Contact your system administrator for more information.

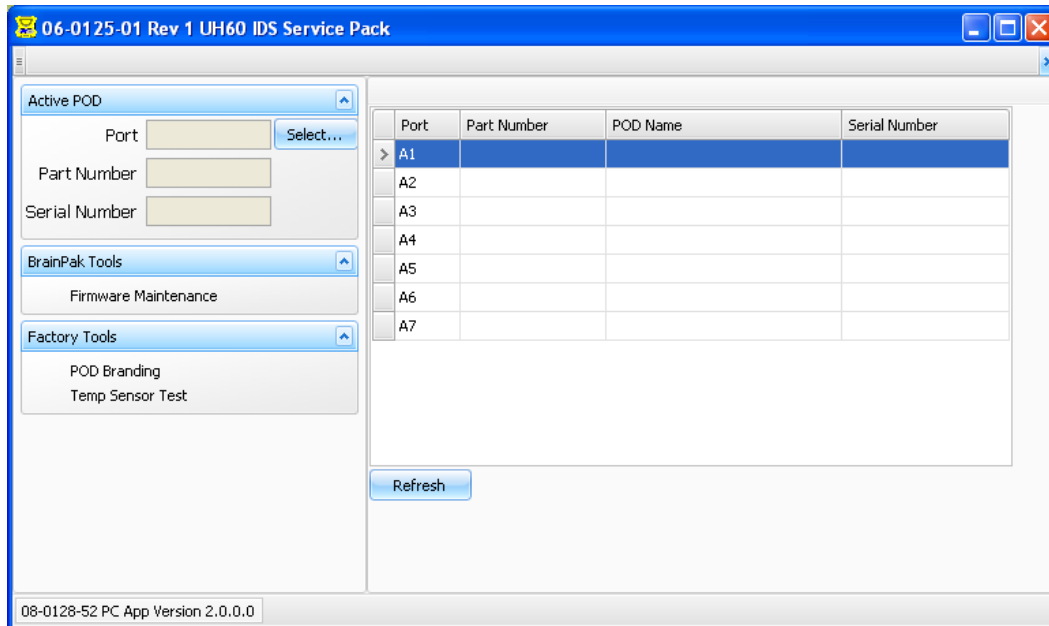


Figure 3-2 – IDS Service Pack Application

The main window of the IDS Service Pack is shown above. The service pack part number, name, and version is shown at the top of the window; the part number, name, and version of the accompanying PC application is shown at the bottom. Refer to the ULTRAX website to see if a newer version is available.

When you are running the service pack program:

- DO select the Test Set Maintenance screen on the UxValidator, and then DO NOT operate the UxValidator while the service pack program is running.
- Anytime the program appears non-responsive, close and restart it.
- It is safe to close the program at any time.

Instructions for updating firmware on the IDS Set are found in Section 4.2.4 on page 28; instructions for aligning the set are in Section 4.3.3 on page 36.

4.0 Self-test, Firmware Updates, and Calibration

This section covers Self-test, Firmware Updates, and Calibration. Complete these procedures at the following times:

1. Run Self-test before each use of the UxValidator IDS Line Test Set.
2. Calibrate the set annually and after replacing any of the components of the test set. Always follow calibration with Self-test.
3. Update firmware when new firmware is available. Follow a firmware update with:
 - Self-test (to confirm proper test set function after the update)
 - Calibration (to set-up the test set according to the new firmware)
 - Another self-test (to confirm proper test set function after the calibration)

Following these instructions will ensure the best possible operation of the IDS Set.

IDS Set component failures are addressed at the end of this section.

4.1 Self-test

Self-test for the IDS Set takes only a few minutes. Always run Self-test before you use the set.

4.1.1 Equipment Needed

Table 4-1 – Self-test Equipment

Part Number	Description	Part of Ultrax Set PN	Minimum Use Specifications
08-0911-02	UxValidator	10-0210-02	See * below
08-1229-20	Wall Power Adapter Assy	10-0210-02	See * below
06-0105-85	IDS BrainPak	06-0125-65	No Substitutes
07-0210-02	IDS Pods (2)	06-0125-65	No substitutes
08-0412-04	Hi-Speed Data Cables (2)	06-0125-65	No substitutes
08-0412-10	IDS Self-test Harness	06-0125-65	No substitutes
08-0707-01	Temperature Probe Harness	06-0125-65	No substitutes

* In place of the UxValidator and other components of the ULTRAX Set PN 10-0210-02, you can use an UxValidator PN 03-1217-02 and the components of the Series I Pod Adapter Set, PN 10-0210-01. Refer to Maintenance Manual PN 10-0210-19 for further information.

4.1.2 IDS Set Self-test

1. Set up the components for Self-test.
 - A. If not already done, install BrainPak PN 06-0105-85 into the UxValidator chassis.
 - B. Connect one end of the IDS Self-test Harness to J1 of the UxValidator.

- C. Connect the other end of the self-test harness to the rear connector of one of the pods.
 - D. If not already done, connect Hi-Speed Data Cable PN 08-0412-04 between the A1 port of the UxValidator and the data port of the pod.
2. Apply power to the UxValidator using either power option. Turn on pod power. The UxValidator will initialize, and then the Startup page will appear.

NOTE

If only one pod is hooked up to the system, NO LINK will be displayed on the screen.

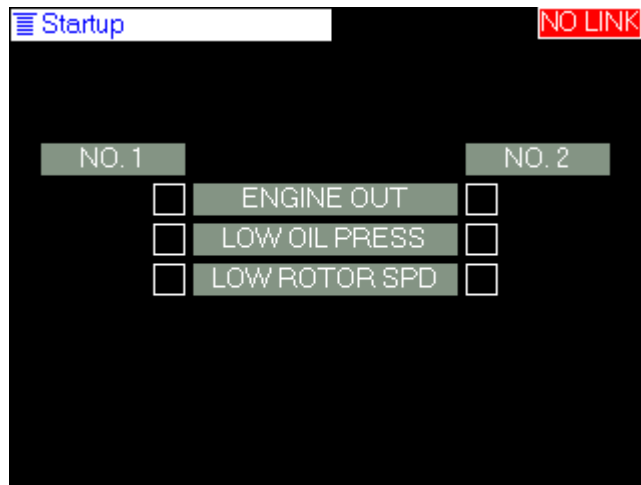


Figure 4-1 – Startup Page

3. Activate the Startup field and the system menu will appear.

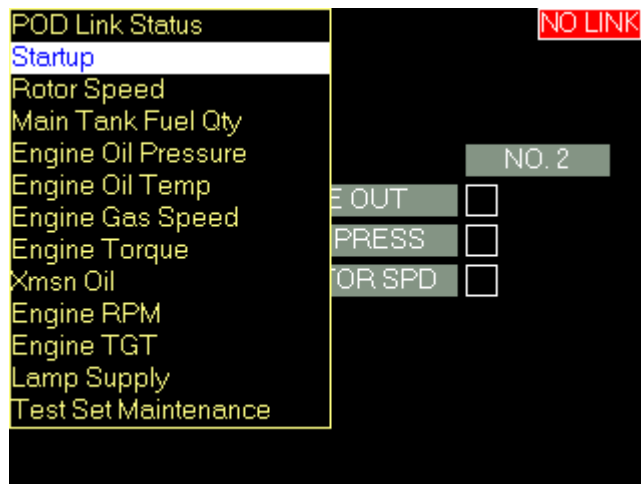


Figure 4-2 – System Menu

4. Select and activate the Test Set Maintenance option. The Test Set Maintenance menu will appear.



Figure 4-3 – Test Set Maintenance Options

5. There are three options available in the Test Set Maintenance menu:
 - 07-0210-02 Self-Test – This option starts the Pod Self-Test that is described in this section.
 - Comm Self-Test– This option tests the UxValidator A and B Comm Ports. The adapters needed for the test are part of the Series II UxValidator Test Set PN 10-0210-02; the instructions for the test are included in the Series II UxValidator Maintenance Manual PN 10-0210-17.
 - Display Versions – This option brings up a screen that displays the part number and firmware versions for all CCAs it finds in the UxValidator and any pods that it finds connected to the Comm A and B ports.
6. From the Test Set Maintenance menu, select and activate 07-0210-02 Self-Test. A message will appear on the screen repeating the instruction to connect the pod to the self-test adapter.
7. Press the left Encoder knob to start the test.
The Pod Self Test page will appear and self-test will begin to run.

NOTE

If a failure occurs, rerun the Self-test. If the Self-test fails again, contact ULTRAX at 816-214-9999.

8. When the Self-test has passed:
 - A. Remove power from the UxValidator.
 - B. Disconnect the Hi-Speed Data Cable and the self-test harness from the pod.
 - C. Connect the Hi-Speed Data Cable and the self-test harness to the second pod.
9. Test the second pod as described in steps 2 through 7.

10. When the second pod has passed Self-test, test the Temperature Probe Cable:
 - A. Return to the system menu and select *Engine TGT*.
The AMBIENT field should indicate *N/C*.
 - B. Connect Temperature Probe Harness PN 08-0717-01 to one of the B data ports.
Verify that the AMBIENT field changes from *N/C* to the current ambient temperature.
 - C. Expose the end of the temperature probe to a noticeably different temperature.
This can typically be done by holding the end of the temperature probe so that its IC is between your fingers or between the palms of your hands.
 - D. Verify that the AMBIENT field indicates a change in temperature.
11. When self-test has passed:
 - Turn off the pod, and remove power from the UxValidator.
 - Disconnect the self-test harness from the UxValidator and the pod.

NOTE

The firmware update procedure will not work when the self-test harness is connected.

This completes the Self-test.

- To use the IDS Set for troubleshooting, set up components as needed and proceed as described in TM 1-1520-237-23, PN 07-0601-01.
- To calibrate the IDS Set, set up the components as needed and calibrate as described in Section 4.3 on page 33.

4.2 Firmware Updates

The PC application and the firmware used with the IDS Set are available on the ULTRAX website through a single package called the 06-0125-65 IDS Service Pack Application. This software and firmware is accessed using a PC and is transferred to the IDS Set using an ULTRAX USB cable.

4.2.1 Equipment Needed

Table 4-2 – Firmware Update Equipment

Part Number	Description	Part of Ultrax Set PN	Minimum Use Specifications
08-0911-02	UxValidator	10-0210-02	See * below
08-1229-20	Wall Power Adapter Assy	10-0210-02	See * below
06-0105-85	IDS BrainPak	06-0125-65	No Substitutes
04-0415-16	ULTRAX USB cable	10-0210-02	Any ULTRAX USB Cable
08-0412-04	Hi-Speed Data Cable (2)	06-0125-65	No substitutes
07-0210-02	IDS Pod (2)	06-0125-65	No substitutes
N/A	IBM-compatible PC	N/A	See below

* In place of the UxValidator and other components of the ULTRAX Set PN 10-0210-02, you can use an UxValidator PN 03-1217-02 and the components of the Series I Pod Adapter Set, PN 10-0210-01. Refer to Maintenance Manual PN 10-0210-19 for further information.

4.2.2 PC System Requirements

The system requirements for updating the software are listed below.

- Windows 2000 / Windows XP or any later version
- Microsoft .NET Framework 3.5 or higher (available for free from www.microsoft.com)
- One available USB 1.1 or higher port

As noted above, the update requires a feature of Windows called the Microsoft .NET Framework. The ULTRAX website download page will detect and report if this software is present on your computer.

You must also have administrative rights to your computer and authorization to install a USB device driver. Contact your system administrator for more information.

4.2.3 Service Pack Installation

Download the latest service pack from the ULTRAX website:


1. Go to *www.ultraxinc.com*.
2. In the Downloads section, click on *UxValidator Firmware*.
3. In the table provided, find *H60 IDS*. (The *ReadMe* link, if present, gives abbreviated instructions on updating the firmware; the *Download* link starts the software download procedure.)
4. Follow the on-screen instructions to install the service pack onto the PC.

The IDS Service Pack Application is now installed on your computer. You can now check and update firmware.

4.2.4 Checking and Updating Firmware

CAUTION

Do not operate the UxValidator while the firmware is being updated.

1. Set up the system.
 - A. Install BrainPak PN 06-0105-85 into the UxValidator chassis.
 - B. Remove the BrainPak USB cover plate.
 - C. Using USB cable PN 04-0415-16, connect the UxValidator to an available USB port on the PC.
 - D. Connect Hi-Speed Data Cable PN 08-0412-04 between the data port of one of the IDS Pods and the A1 port of the UxValidator.
 - E. Connect the second Hi-Speed Data Cable between the data port of the other IDS Pod and the A2 port of the UxValidator.
 - F. Apply power to the UxValidator. Turn on the pods. The introductory system page will appear.
 - G. From the system menu, select and activate *Test Set Maintenance*. The Test Set Maintenance menu will appear. You **MUST** leave the Test Set Maintenance page displayed while updating firmware.
2. Check the set's BrainPak firmware.
 - A. Launch the IDS Service Pack Application using the  icon on your desktop. The service pack application will open.

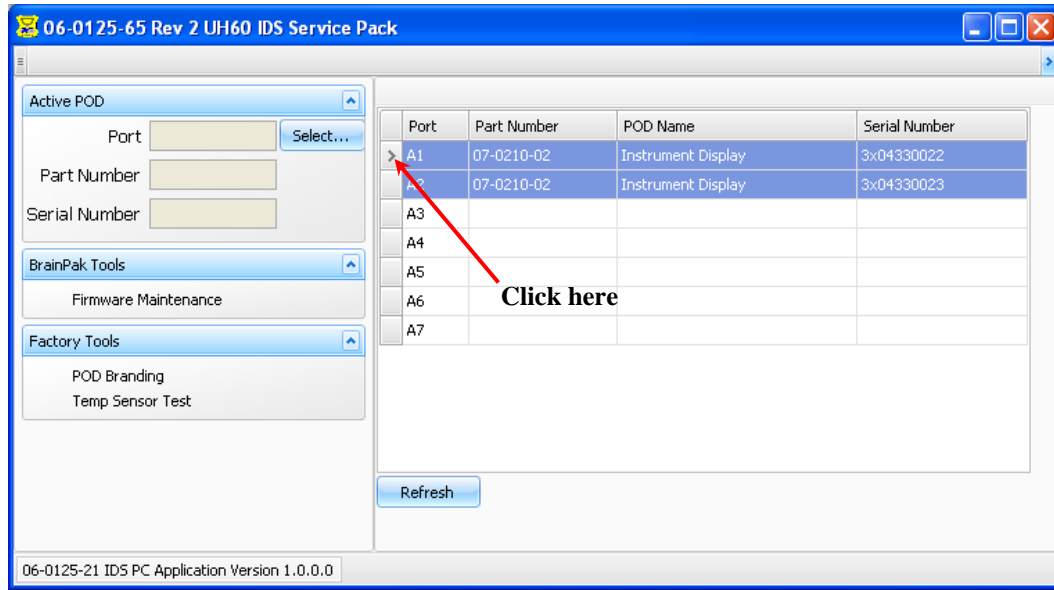


Figure 4-4 – IDS Service Pack Application

- B.** Select the arrow to the left of the A1 Port field.
The screen will change somewhat and some of the fields will be filled in.

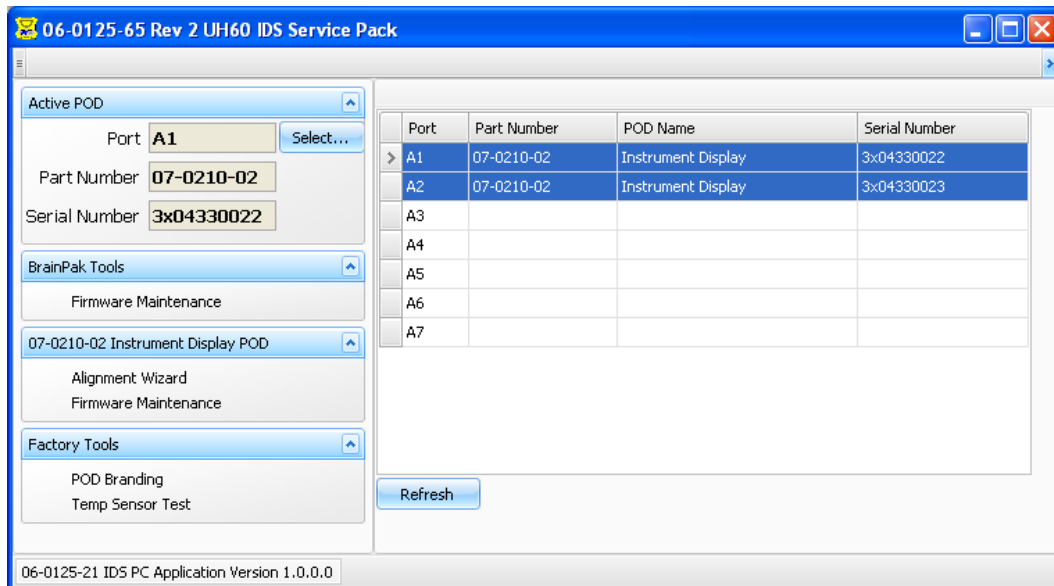


Figure 4-5 – Pod Recognized

- C.** On the left side of the screen under BrainPak Tools, select *Firmware Maintenance*.
The BrainPak Firmware Maintenance window will open.

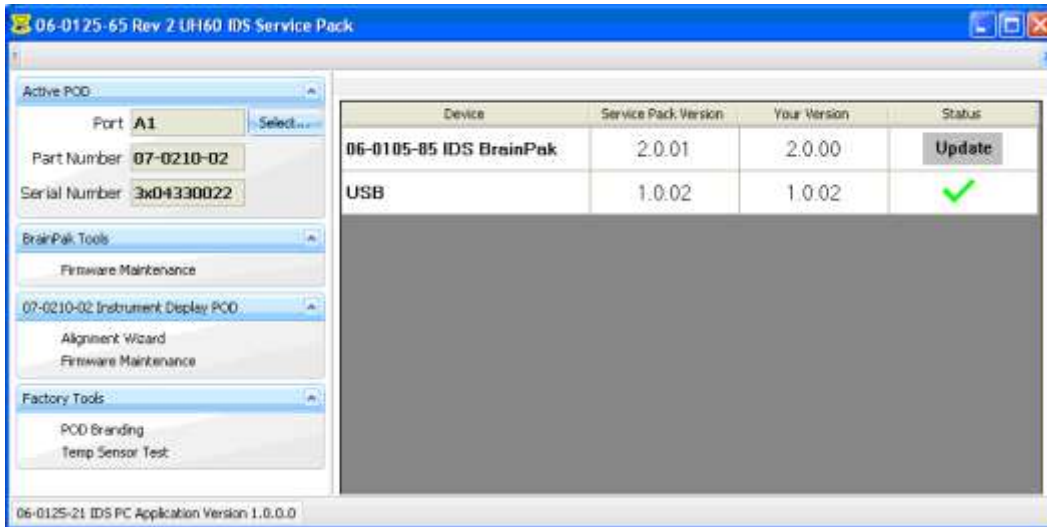



Figure 4-6 – BrainPak Firmware Maintenance

- D.** The PC Application will display *Service Pack Version* and *Your Version* for any BrainPak firmware that it detects. If any of the firmware versions are different, *Update* is noted in the Status column.
- 3.** If needed, update the firmware.

NOTE

Do not move any knobs or connectors while the firmware is being updated. Allow the program to run undisturbed.

- A.** Click on an Update field; the service pack application will update the associated firmware:
- The Update field will change to . Wait for several seconds; the Update Message Box will appear.
 - When the update is complete, the message box will disappear. Wait again.
 - After several seconds, a green check will appear, indicating that the firmware is now up to date.
- B.** Continue updating until all the firmware is current.
- C.** When the updates are complete, *Your Version* will now match *Service Pack Version* for all BrainPak firmware.

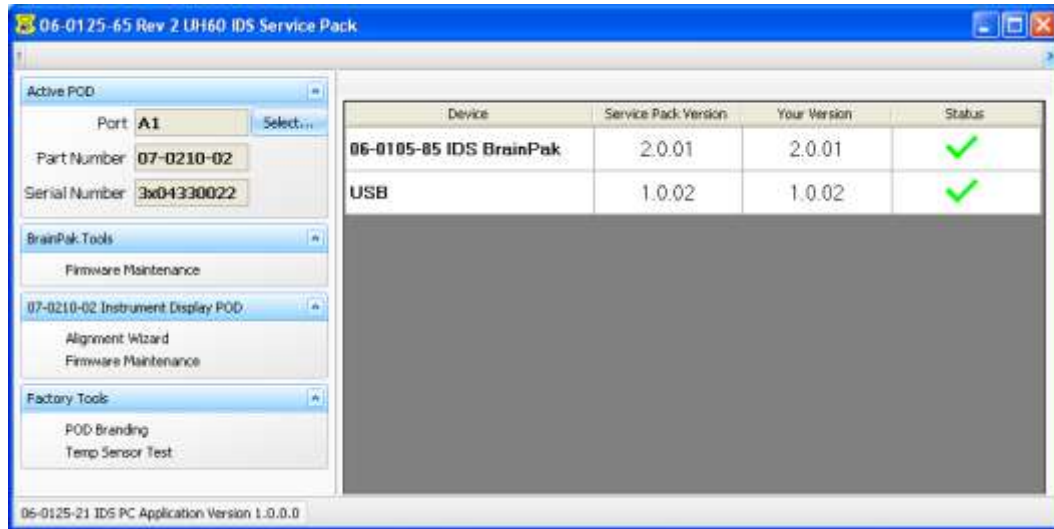


Figure 4-7 – BrainPak Firmware Updated

NOTE

If the firmware in the pod is a newer version than that found in the Service Pack Manager, a note to that effect will appear on the screen.

4. Check the first pod’s firmware.
 - A. On the left side of the screen under *07-0210-02 Instrument Display POD*, select *Firmware Maintenance*.
The Pod Firmware Maintenance window will open.

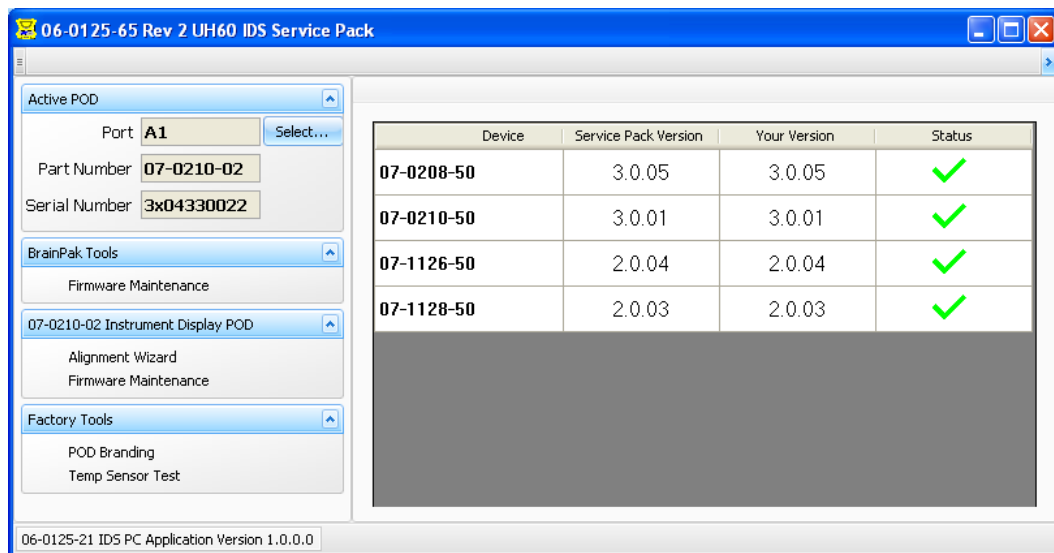


Figure 4-8 – Pod Firmware Maintenance

- B. The PC Application will display *Your Version* and *Service Pack Version* for the Pod firmware in the *active* pod. If any of the firmware versions are different, *Update* is noted in the Status column.

- C. If needed, update the pod firmware the same way you updated the BrainPak firmware.
- 5. Check the second pod's firmware.
 - A. Under the Active POD heading, click on *Select*. Both pods will be noted on the right side of the display.
 - B. On the right side of the display, select the arrow to the left of the A2 Port field. The information in the Active POD heading will change to reflect the pod that is connected to the A2 data port.
 - C. On the left side of the screen under *07-0210-02 Instrument Display POD*, select *Firmware Maintenance*. The Pod Firmware Maintenance window will open.
 - D. If needed, update the second pod's firmware.

4.2.5 Shutdown

- 1. Your system now has the latest firmware. Shut down and disconnect the equipment as follows:
 - A. Close the IDS Service Pack application.
 - B. Turn off the pods. Remove power from the UxValidator.
 - C. Disconnect the USB cable from the PC and the UxValidator. Reinstall the USB cover plate.
- 2. After any firmware update, self-test and then calibrate the IDS Set. Refer to page 23 for Self-test and page 33 for Calibration.

4.3 Calibration

Calibration for the UxValidator IDS Line Test Set consists of an Alignment and a Performance Check for the set's pods. Align the pods by following the on-screen instructions of the Alignment Wizard (part of the IDS Service Pack). Performance checks follow immediately after alignment. The performance check program is run by the BrainPak and viewed on the UxValidator display; the procedure is found in this section of the manual.

Overview

The Alignment Wizard gives on-screen, step-by-step instructions on how to align the IDS Pods. Most steps consist of either measuring a voltage and recording it in a box on the screen or using the on-screen tool to adjust a voltage. Near the end of the alignment procedure is a Calibration Data Review screen. When you click *Next>* on this screen, the program will complete the alignment using the values you observed and the settings you made.

The Performance Check consists primarily of setting up the test parameters as described in the manual, providing specified inputs, and verifying that the results are within the specified tolerances. Take all measurements on J1 (socket contacts) of the pod. Because both pods can be checked at the same time, the performance check procedures refer to Pod A and Pod B.

4.3.1 Equipment Needed

Table 4-3 – Calibration Equipment Needed – ULTRAX

Part Number	Description	Part of Ultrax Set PN	Minimum Use Specifications
08-0911-02	UxValidator	10-0210-02	See * below
08-1229-20	Wall Power Adapter Assy	10-0210-02	See * below
06-0105-85	IDS BrainPak	06-0125-65	No substitutes
04-0415-16	ULTRAX USB cable	10-0210-02	Any ULTRAX USB Cable
08-0412-04	Hi-Speed Data Cables (2)	06-0125-65	No substitutes
07-0210-02	IDS Pods (2)	06-0125-65	No substitutes

* In place of the UxValidator and other components of the ULTRAX Set PN 10-0210-02, you can use an UxValidator PN 03-1217-02 and the components of the Series I Pod Adapter Set, PN 10-0210-01. Refer to Maintenance Manual PN 10-0210-19 for further information.

Table 4-4 – Calibration Equipment Needed – Other

Common Name	Minimum Use Specifications	Equipment Type
Digital Multimeter	Range: 0-50VDC Accuracy: 0.025% Range: 0-150VAC Accuracy: 0.4% (true-rms) Range: 0-500Ω Accuracy: 0.05% Range: DC to 20kHz Frequency: 0.005%	Fluke Model 189 or equivalent
M39029/4-115 compatible Meter Probes or adapter.	N/A	N/A
AC Power Source	Range: 10-115 VAC 400Hz, adjustable. Accuracy: ±0.5%	N.H Research Inc. Model SF613-1 (MIS-1022, Type 1); K-H4100/7500A or equivalent
DC Power Source	Range: 0-28 VDC	N/A

4.3.2 Setup

Set up the troubleshooting set as follows:

1. If not already done, install BrainPak PN 06-0105-85 into the UxValidator chassis.
2. Remove the BrainPak USB cover plate.

NOTE

Verify that you have the most current service pack installed from the ULTRAX website. (Refer to Firmware Updates on page 28.)

3. Using USB cable PN 04-0415-16, connect the BrainPak to an available USB port on the PC.
4. If not already done, connect Hi-Speed Data Cable PN 08-0412-04 between the A1 port of the UxValidator and the data port of IDS Pod PN 10-0113-04.
5. Apply power to the UxValidator. Turn on the pod.

- Let the system warm up for the length of time noted below.

Table 4-5 – Warm-up Time

Ambient Temperature	Warm-up Time
≥20°C (≥68°F)	None
0 to 20°C (32 to 68°F)	10 minutes
-10 to 0°C (14 to 32°F)	20 minutes

- Launch the 06-0125-20 IDS Service Pack Application using the icon on your desktop. The service pack application will open.

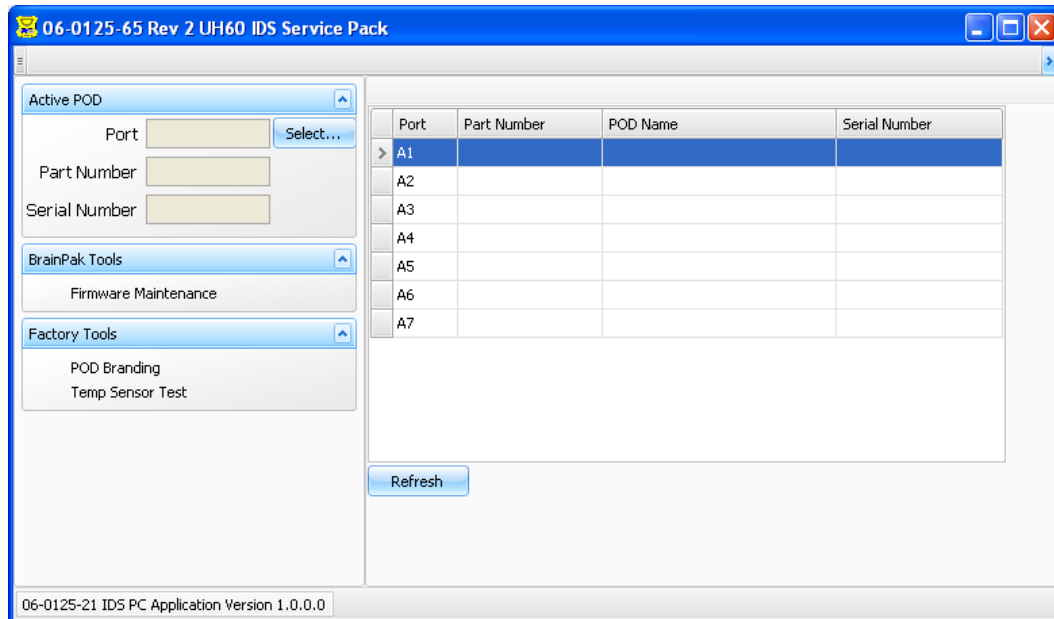


Figure 4-9 – 06-0125-20 IDS Service Pack Application

- If there is no pod information on the right side of the screen, click *Refresh*. Pod information will appear.

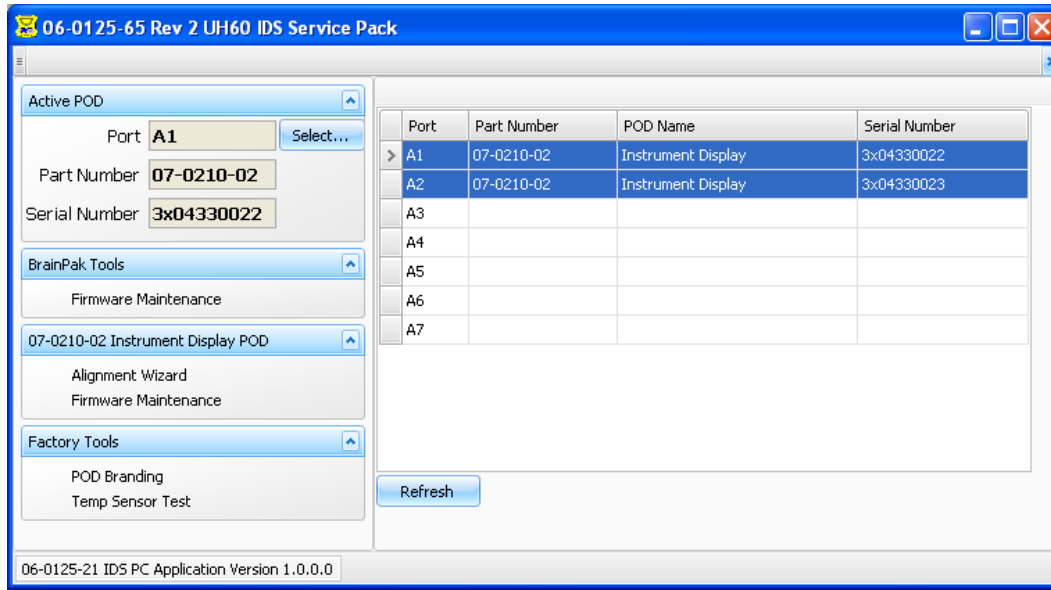


Figure 4-10 – Service Pack Showing Pod Information

4.3.3 Alignment

1. On the left side of the screen under *07-0210-02 Instrument Display POD*, select *Alignment Wizard*.
The Alignment Wizard will open.

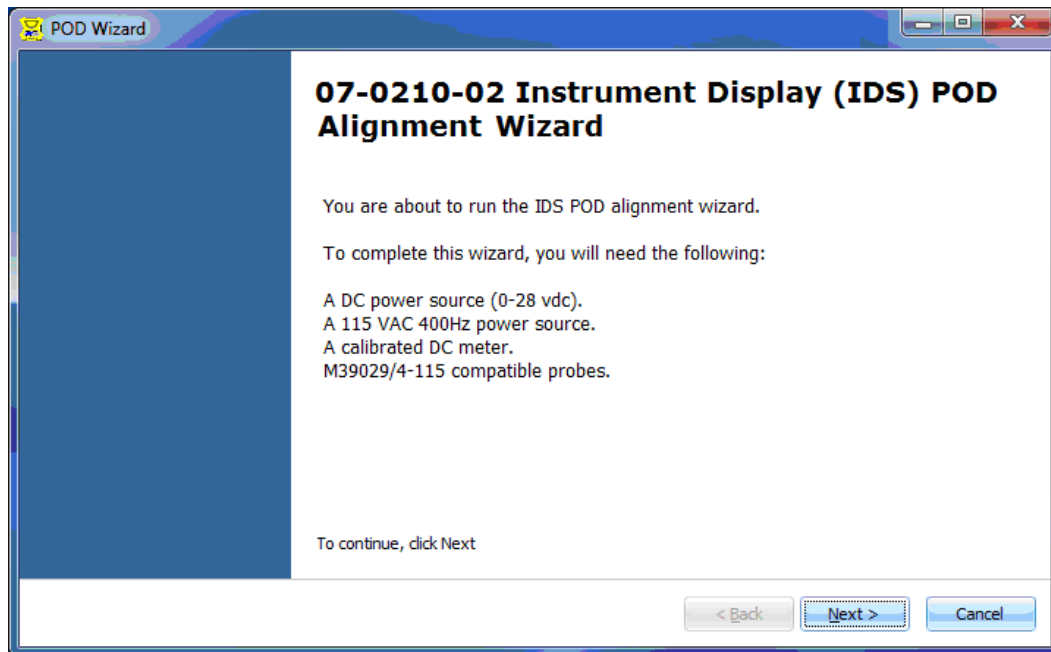


Figure 4-11 – Pod Alignment Wizard

The first screen of the Pod Alignment Wizard lists the equipment needed to complete the alignment. For specific information, refer to Table 4-4.

2. Follow the instructions in the wizard to complete the alignment.

3. At the end of the alignment, the program will write the calibration data to the pod, using the values you observed and the settings you made. The following window will then appear.

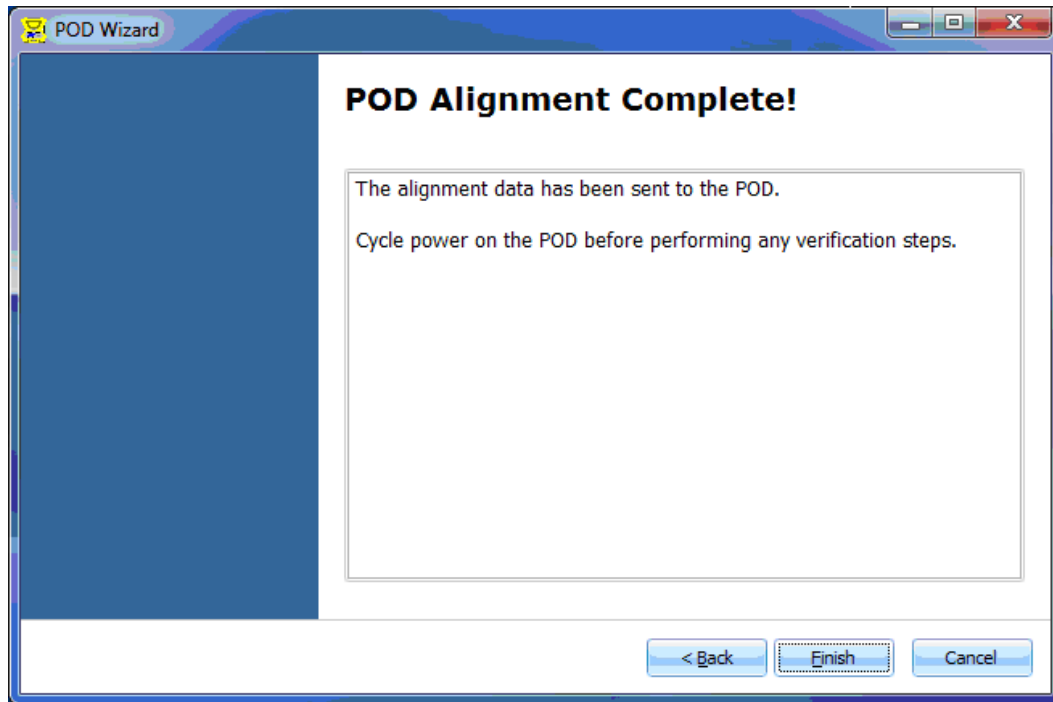


Figure 4-12 – Alignment Complete

4. When the pod alignment is complete:
 - A. Turn off pod power and remove power from the UxValidator.
 - B. Disconnect the Hi-Speed Data Cable from the data port of the pod.
5. Align the second pod:
 - A. Connect the Hi-Speed Data Cable to the data port of the *second* Pod in the IDS set.
 - B. Apply power to the UxValidator. Turn on the pod.
 - C. Select *Refresh* on the service pack screen. Information for the second pod will appear.
 - D. Repeat steps 1 through 3 to align the second pod.
6. When both pods are aligned:
 - A. Close the Service Pack Manager.
 - B. Turn off pod power and remove power from the UxValidator.
 - C. Disconnect the USB cable from the PC and the UxValidator.
 - D. Proceed with the performance checks.

NOTE

If only one pod is hooked up to the system, NO LINK will be displayed on the screen.

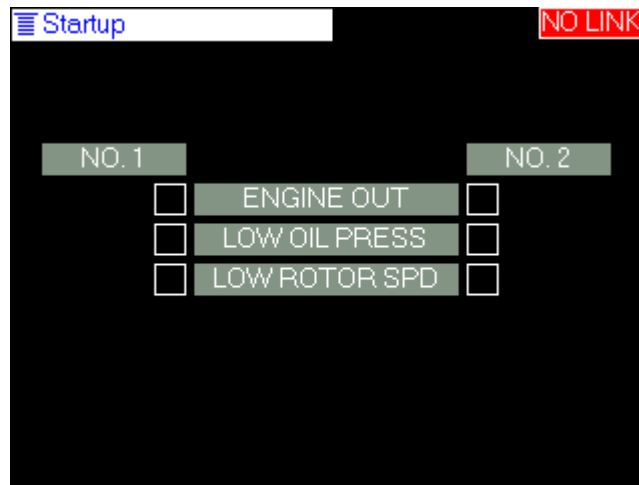


Figure 4-14 – Startup Page

E. Activate the Startup field and the system menu will appear.

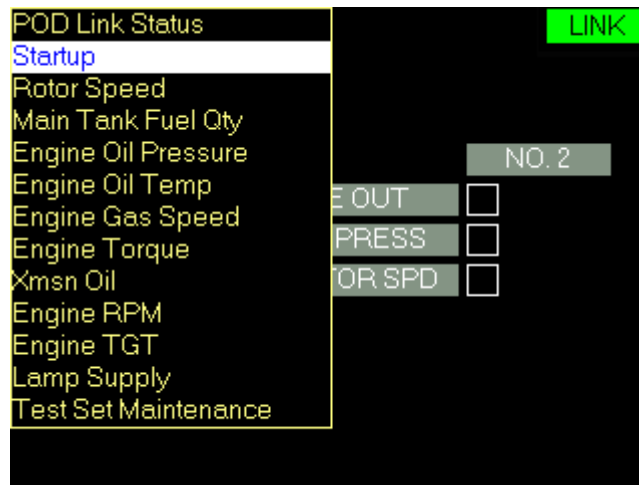


Figure 4-15 – System Menu

2. Rotor Speed

- A. From the system menu, select *Rotor Speed*.
- B. Set the DMM to measure frequency.
- C. Complete the following steps with Pod A.
 - 1) Put the positive DMM lead into pod socket A and the negative lead into B.
 - 2) Select the ROTOR SPEED mode field, leaving *ADJUST* selected.

- 3) Verify that the Rotor Speed indication shows no green. If needed, turn the right Encoder knob counterclockwise until the Rotor Speed indication shows no green.
Verify that the DMM indicates <2Hz or DC only.
 - 4) Press and turn the right Encoder knob clockwise until the Rotor Speed indication shows all green.
Verify that the DMM indicates >17.2kHz.
 - 5) Set the ROTOR SPEED mode field to *CAL HI*.
Verify that the DMM indicates 11.2361 to 11.2561 kHz.
 - 6) Set the ROTOR SPEED mode field to *CAL LO*.
Verify that the DMM indicates <2Hz or DC only.
- D.** Repeat the procedures in step C for Pod B.
- 3. Engine Gas Speed**
- A.** Leave the DMM set to AC frequency.
 - B.** From the system menu, select *Engine Gas Speed*.
 - C.** Complete the following steps with Pod A.
 - 1) Put the positive DMM lead into pod socket c and the negative lead into d.
 - 2) Select the NO. 1 mode field, leaving *ADJUST* selected.
 - 3) Turn the right Encoder knob counterclockwise until the NO. 1 indication shows no green.
Verify that the DMM indicates <2Hz or DC only.
 - 4) Turn the right Encoder knob clockwise until the NO. 1 indication shows all green.
Verify that the DMM indicates >2.4kHz.
 - 5) Set the NO. 1 mode field to *CAL HI*.
Verify that the DMM indicates 2133.3 to 2137.3 Hz.
 - 6) Set the NO. 1 mode field to *CAL LO*.
Verify that the DMM indicates <2Hz or DC only.
 - D.** Repeat the procedures in step C for Pod B using the NO. 2 control.
- 4. Engine RPM (1 & 2)**
- A.** Leave the DMM set to AC frequency.
 - B.** From the system menu, select *Engine RPM*.
 - C.** Complete the following steps with Pod A.
 - 1) Put the positive DMM lead into pod socket C and the negative lead into D.
 - 2) Select the NO. 1 mode field, leaving *ADJUST* selected.

- 3) Turn the right Encoder knob counterclockwise until the NO. 1 indication shows no green.
Verify that the DMM indicates $<2\text{Hz}$ or DC only.
- 4) Turn the right Encoder knob clockwise until the NO. 1 indication shows all green.
Verify that the DMM indicates $>1830\text{Hz}$.
- 5) Set the NO. 1 mode field to *CAL HI*.
Verify that the DMM indicates 1333.5 to 1337.5 Hz.
- 6) Set the NO. 1 mode field to *CAL LO*.
Verify that the DMM indicates $<2\text{Hz}$ or DC only.
- 7) Move the positive DMM lead to pod socket Y and the negative lead to Z.
- 8) Select the NO. 2 mode field, leaving *ADJUST* selected.
- 9) Turn the right Encoder knob counterclockwise until the NO. 2 indication shows no green.
Verify that the DMM indicates $<2\text{Hz}$ or DC only.
- 10) Turn the right Encoder knob clockwise until the NO. 2 indication shows all green.
Verify that the DMM indicates $>1830\text{Hz}$.
- 11) Set the NO. 2 mode field to *CAL HI*.
Verify that the DMM indicates 1333.5 to 1337.5 Hz.
- 12) Set the NO. 2 mode field to *CAL LO*.
Verify that the DMM indicates $<2\text{Hz}$ or DC only.

D. Repeat the procedures in step C for Pod B.

5. Main Tank Fuel Quantity

A. Set the DMM to measure DC volts.

B. From the system menu, select *Main Tank Fuel Qty*.

C. Complete the following steps with Pod A.

- 1) Put the positive DMM lead into pod socket G and the negative lead into H.
- 2) Select the NO. 1 mode field, leaving *ADJUST* selected.
- 3) Turn the right Encoder knob counterclockwise until the NO. 1 indication shows no green.
Verify that the DMM indicates $<0.050\text{Vdc}$.
- 4) Turn the right Encoder knob clockwise until the NO. 1 indication shows all green.
Verify that the DMM indicates $>7.0\text{Vdc}$.

- 5) Set the NO. 1 mode field to *CAL HI*.
Verify that the DMM indicates 6.075 to 6.175 Vdc.
 - 6) Set the NO. 1 mode field to *CAL LO*.
Verify that the DMM indicates <0.050Vdc.
- D.** Repeat the procedures in step C for Pod B using the NO. 2 control and indication.

6. Engine Torque

- A.** Leave the DMM set to DC Volts.
- B.** From the system menu, select *Engine Torque*.
- C.** Complete the following steps with Pod A.
 - 1) Put the positive DMM lead into pod socket E and the negative lead into F.
 - 2) Select the NO. 1 mode field, leaving ADJUST selected.
 - 3) Turn the right Encoder knob counterclockwise until the NO. 1 indication shows no green.
Verify that the DMM indicates <0.035Vdc.
 - 4) Turn the right Encoder knob clockwise until the NO. 1 indication shows all green.
Verify that the DMM indicates >5.4Vdc.
 - 5) Set the NO. 1 mode field to *CAL HI*.
Verify that the DMM indicates 3.69 to 3.71 Vdc.
 - 6) Set the NO. 1 mode field to *CAL LO*.
Verify that the DMM indicates <0.035Vdc.
 - 7) Move the positive DMM lead to pod socket a and the negative lead to b.
 - 8) Select the NO. 2 mode field, leaving ADJUST selected.
 - 9) Turn the right Encoder knob counterclockwise until the NO. 2 indication shows no green.
Verify that the DMM indicates <0.035Vdc.
 - 10) Turn the right Encoder knob clockwise until the NO. 1 indication shows all green.
Verify that the DMM indicates >5.4Vdc.
 - 11) Set the NO. 2 mode field to *CAL HI*.
Verify that the DMM indicates 3.69 to 3.71 Vdc.
 - 12) Set the NO. 2 mode field to *CAL HI.CAL LO*.
Verify that the DMM indicates <0.035Vdc.
- D.** Repeat the procedures in step C for Pod B.

7. Engine TGT

- A. Set the DMM to measure DC millivolts.
- B. From the system menu, select *Engine TGT*.
- C. Complete the following steps with Pod A.
 - 1) Put the positive DMM lead into pod socket e and the negative lead into f.
 - 2) Set the NO. 1 control to *ADJUST*.
 - 3) Turn the NO. 1 control full CCW.
Verify that the DMM indicates <0.035mVdc.
 - 4) Turn the NO. 1 control full CW.
Verify that the DMM indicates >40mVdc.
 - 5) Set the NO. 1 control to *CAL HI*.
Verify that the DMM indicates 33.717 to 33.817 mVdc.
 - 6) Set the NO. 1 control to *CAL LO*.
Verify that the DMM indicates 0.107 to 0.207 mVdc.
- D. Repeat the procedures in step C for Pod B using the NO. 2 control.

8. Engine Oil Pressure

- A. Set the DMM to measure AC volts.
- B. Adjust the AC power source for an output of 10V_{RMS} at 400Hz.
- C. Turn off the output of the AC power Source.
- D. From the system menu, select *Engine Oil Pressure* screen.
- E. Complete the following steps with Pod A.
 - 1) Connect the AC power source to pod sockets i and N.
 - 2) Turn on the AC power source output.
 - 3) Set the NO. 1 control to *ADJUST*.
 - 4) Turn the NO. 1 control full CCW.
 - 5) Measure and record the AC power source output.
 - 6) Put the positive DMM lead into pod socket k and the negative lead into j.
Verify that the DMM indicates 59.65 to 60.05% of the recorded AC output.
 - 7) Turn the NO. 1 control full CW.
 - 8) Measure and record the AC power source output.
 - 9) Return the positive DMM lead to pod socket k and the negative lead to j.
Verify that the DMM indicates 40.03 to 40.43% of the recorded AC output.
 - 10) Set the NO. 1 control to *CAL HI*.
 - 11) Measure and record the AC power source output.
 - 12) Return the positive DMM lead to pod socket k and the negative lead to j.
Verify that the DMM indicates 48.37 to 48.77% of the recorded AC output..

- 13) Set the NO. 1 control to *CAL LO*.
 - 14) Measure and record the AC power source output.
 - 15) Return the positive DMM lead to pod socket k and the negative lead to j.
Verify that the DMM indicates 59.65 to 60.05% of the recorded AC output.
 - 16) Turn off the output of the AC power source.
 - 17) Disconnect the AC power source from Pod A.
- F.** Repeat the procedures in step E for Pod B using the NO. 2 control.

9. XMSN Oil Pressure

- A.** Leave the DMM set to AC volts.
- B.** Adjust the AC power source for an output of 10V_{RMS} at 400Hz.
- C.** Turn off the output of the AC power Source.
- D.** From the system menu, select *XMSN Oil*.
- E.** Complete the following steps with Pod A.
 - 1) Connect the AC power source to pod sockets W and B.
 - 2) Turn on the AC power source output.
 - 3) Set the NO. 1 control to *ADJUST*.
 - 4) Turn the NO. 1 control full CCW.
 - 5) Measure and record the AC power source output.
 - 6) Put the positive DMM lead into pod socket T and the negative lead into N.
Verify that the DMM indicates 59.65 to 60.05% of the recorded AC output.
 - 7) Turn the NO. 1 control full CW.
 - 8) Measure and record the AC power source output.
 - 9) Return the positive DMM lead to pod socket T and the negative lead to N.
Verify that the DMM indicates 40.03 to 40.43% of the recorded AC output.
 - 10) Set the NO. 1 control to *CAL HI*.
 - 11) Measure and record the AC power source output.
 - 12) Return the positive DMM lead to pod socket T and the negative lead to N.
Verify that the DMM indicates 46.9 to 47.3% of the recorded AC output.
 - 13) Set the NO. 1 control to *CAL LO*.
 - 14) Measure and record the AC power source output.
 - 15) Return the positive DMM lead to pod socket T and the negative lead to N.
Verify that the DMM indicates 59.65 to 60.05% of the recorded AC output.
 - 16) Turn off the output of the AC power source.
 - 17) Disconnect the AC power source from Pod A.
- F.** Repeat the procedures in step E for Pod B.

10. XMSN Oil Temperature

- A.** Set the DMM to measure ohms.
- B.** Stay in the *XMSN Oil* screen.
- C.** Complete the following steps with Pod A.
 - 1) Put the positive DMM lead into pod socket J and the negative lead into K.
 - 2) Set the TEMP control to *ADJUST*.
 - 3) Turn the TEMP control full CWW.
Verify that the DMM indicates <88 ohms.
 - 4) Turn the TEMP control full CW.
Verify that the DMM indicates >270 ohms.
 - 5) Set the TEMP control to *CAL HI*.
Verify that the DMM indicates 234 to 236 ohms.
 - 6) Set the TEMP control to *CAL LO*.
Verify that the DMM indicates 87 to 89 ohms.
- D.** Repeat the procedures in step C for Pod B.

11. Engine Oil Temperature

- A.** Leave the DMM set to ohms.
- B.** From the system menu, select *Engine Oil Temperature*.
- C.** Complete the following steps with Pod A.
 - 1) Put the positive DMM lead into pod socket g and the negative lead into h.
 - 2) Set the NO. 1 control to *ADJUST*.
 - 3) Turn the NO. 1 control full CWW.
Verify that the DMM indicates <77 ohms.
 - 4) Turn the NO. 1 control full CW.
Verify that the DMM indicates >178 ohms.
 - 5) Set the NO. 1 control to *CAL HI*.
Verify that the DMM indicates 153 to 155 ohms.
 - 6) Set the TEMP control to *CAL LO*.
Verify that the DMM indicates 78 to 80 ohms.
- D.** Repeat the procedures in step C for Pod B using the NO. 2 control.

4.3.5 Shut-down

- 1.** When the performance checks are finished:
 - A.** Return to the Test Set Maintenance Menu.
 - B.** Turn off the pods.
 - C.** Remove power from the UxValidator.
 - D.** Disconnect the pods from the Hi-Speed Data Cables.
- 2.** After completing the alignment and performance checks, run Self-test (Page 23).



4.4 UxValidator IDS Line Test Set Component Failures

4.4.1 Component Failures

If a component of the IDS Set fails, contact ULTRAX Technical Support at 816-214-9999.

4.4.2 Component Replacement

Whenever the BrainPak or other component of the IDS Set is replaced, Self-test **MUST** be run to verify that the set is operating properly. Refer to Self-test on Page 23.

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5.0 Maintenance

5.1 Scope of Maintenance

Corrective maintenance at the Organizational Level is limited to performing Preventive Maintenance Checks and Services (PMCS) and replacing faulty assemblies as described in the following section. If, during PMCS, the unit or any of its components are determined to be faulty, perform corrective action as directed by the SMR code or call ULTRAX at 816-214-9999.

5.2 Operator Preventive Maintenance Checks and Services

Preventive Maintenance Checks and Services consist of visual inspections and self-tests that are done by the operator. See the following table for PMCS inspection criteria.

If the UxValidator IDS Line Test Set does not operate after you have completed the PMCS, call ULTRAX at 816-214-9999.

PMCS must be done before and after every use of the troubleshooting set.

Table 5-1– PMCS Requirements

Item No.	Item to be inspected	Procedures	Equipment is not ready/serviceable if:
1	Transit Case	<p>Inspect the case for cracks, holes, or other damage.</p> <p>Inspect hinges, handles, and latches for proper operation. Verify that the pins securing each item are still seated.</p> <p>Inspect the case for cleanliness. If the case is excessively dirty, clean with a soft rag and warm, soapy water.</p>	<p>Any damage is present.</p> <p>Any pins are missing or the hinge, latch, or handle does not operate properly.</p>
2	BrainPak	<p>Inspect Encoder knobs for proper operation. Knobs should be securely fastened and should rotate freely. Detents should be felt as the Encoder knob is rotated. A positive click should be heard when the Encoder knob is pressed.</p> <p>USB Cover is present.</p> <p>Inspect fastening hardware.</p> <p>Inspect connector for damage or corrosion.</p>	<p>Encoder knobs are loose. Detent not felt or click not heard.</p> <p>Cover is missing.</p> <p>Any hardware is missing or loose.</p> <p>Any damage or corrosion is detected.</p>
2	Pods	<p>Inspect J1 and P1 connectors and the Data Port for damaged pins.</p> <p>Check for missing or damaged Power On switch or lamp.</p>	<p>Any pins are bent, broken, or missing.</p> <p>Any items are missing or damaged.</p>
4	Cables	<p>Inspect connectors on both ends for damaged pins.</p> <p>Inspect for loose connectors.</p> <p>Inspect for damage to the cable.</p>	<p>Any pins are bent, broken, or missing.</p> <p>Connectors are loose.</p> <p>Cable wiring appears to be damaged.</p>

6.0 Repair Parts and Special Tools

6.1 Scope

This chapter lists and authorizes spares and repair parts; special tools; special test, measurement, diagnostic, and calibration equipment; and other special support equipment required for organizational, direct support, and general support maintenance of the UxValidator IDS Line Test Set. It authorizes the requisitioning, issuing, and disposition of spares, repair parts, and special tools as indicated by the Source, Maintenance, and Recoverability (SMR) codes.

This Repair Parts and Special Tools section is divided into four parts. They are:

1. Repair Parts List (Section 6.2)

The Repair Parts List shows the spares and repair parts authorized by this RPSTL for use in maintenance. The list also includes parts that must be removed in order to replace the authorized parts.

The SMR code is explained in this section.

2. Special Tools List (Section 6.3)

Not applicable.

3. Cross-Reference Indexes (Section 6.4)

This section contains a Part Number Index on page 59 and a Figure Number Index on page 59. There are currently no items in the IDS Set bill of materials that have a National Serial Number (NSN); there is therefore no NSN-to-Figure Index at this time.

4. How to Find or Confirm the Part Number of Repair Parts (Section 6.5)

This section tells you how to find the part number of a part you need. It also tells how to confirm that a given part number is indeed the correct part number for a part you need.

6.2 Repair Parts List

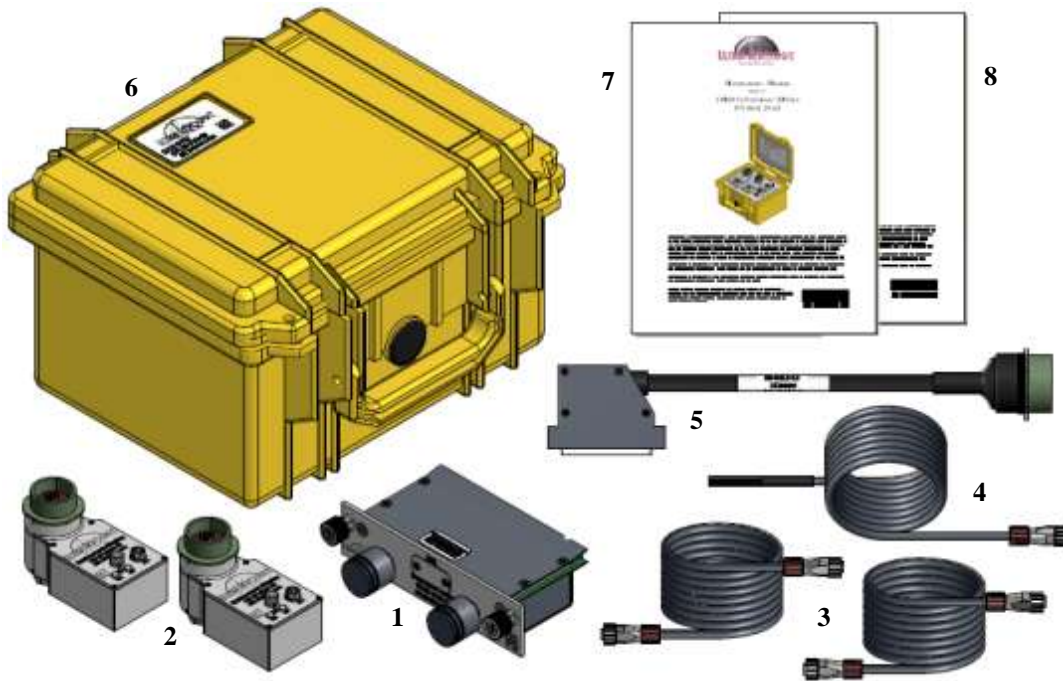


Figure 6-1 – UxValidator IDS Line Test Set PN 06-0125-65

Table 6-1 – UxValidator IDS Line Test Set

Item	SMR Code	CAGE	Part Number	Description	Qty
-	PAOKK	07PR7	06-0125-65	UxValidator IDS Line Test Set	1
1	PAOKK	07PR7	06-0105-85	IDS BrainPak	1
2	PAOKK	07PR7	07-0210-02	IDS Pod	2
3	PAOZZ	07PR7	08-0412-04	Hi-Speed Data Cable	2
4	PAOZZ	07PR7	08-0707-01	4' Temperature Probe Harness	1
5	PAOZZ	07PR7	09-1204-19	Self-test Harness	1
6	PBOZZ	07PR7	09-0113-05	Transit Case	1
7	PAOZZ	07PR7	07-0601-02	Maintenance Manual	1
8	PAOZZ	07PR7	07-0601-01	User's Manual	1

6.2.1 Explanation of Columns in the Repair Parts List

1. Column 1 – Item Number

Indicates the number used to identify items called out in the illustration.

2. Column 2 – SMR Code

The Source, Maintenance, and Recoverability (SMR) code is a five-position code. This code gives supply/requisitioning information, maintenance category authorization criteria, and disposition instruction. Refer to Page 55 to see the breakdown of SMR codes.

In-depth explanation of the SMR code follows in Section 6.2.2, accompanied by the applicable tables.

3. Column 3 – CAGE Code

The CAGE code, also known as the Federal Supply Code for Manufacturer (FSCM), is a 5-digit code which is used to identify the manufacturer, distributor, or government agency, etc. that supplies the item.

4. Column 4 – Part Number

Indicates the primary number used by the manufacturer to identify an item or range of items. (The manufacturer in this case is the individual, company, firm, corporation, or government activity that controls the design and characteristics of the item by means of its engineering drawings, specifications, standards, and inspection requirements.)

NOTE

When you use an NSN to requisition an item, the item you receive might have a different part number from the part ordered.

5. Column 5 – Description

Gives the Federal Item Name (if available) or the manufacturer's description to identify the item.

6. Column 6 – Qty

Indicates the quantity of the item found in the described system. A "V" appearing in this column instead of a quantity indicates that the quantity varies from application to application.

7. Column 7 (if included) – Usable-On Code (UOC)

The Usable-On Code can appear in a UOC column or in the Description column. If no Usable-On Code is shown, the item applies to all models.

6.2.2 SMR Codes

The SMR Codes (Column 2 of the Repair Parts List) are broken down into three sections: Source, Maintenance, and Recoverability. The following figure shows the breakdown of the code's five digits into these three sections. Further explanation of the three sections follows.

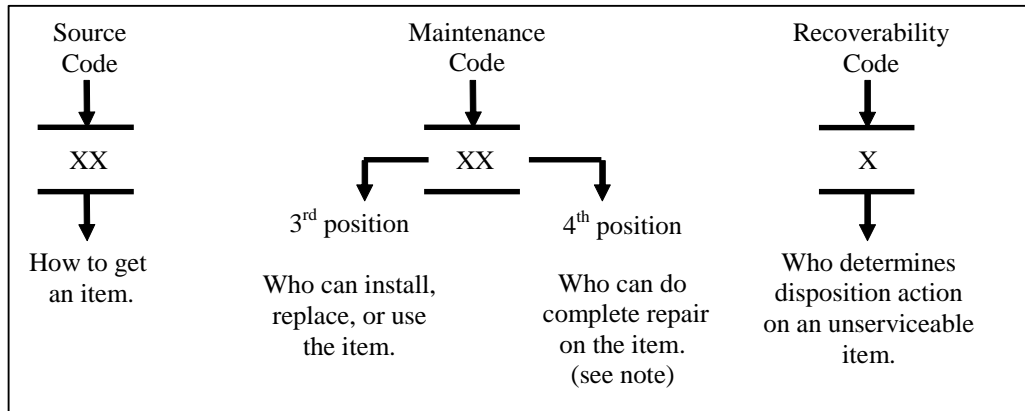


Figure 6-2 – SMR Code Explanation

NOTE

Complete repair is the maintenance capacity, capability, and authority to perform all corrective maintenance tasks of the Repair function in a use/user environment in order to restore serviceability to a failed item.

1. SMR Code – Source

The source code (1st and 2nd position of the SMR Code) tells you how to get an item needed for maintenance, repair, or overhaul of an end item/equipment. Explanations of source codes are listed under the SOURCE heading in the following table.

Table 6-2 – SMR Codes

G-1 JOINT SERVICE CODING REFERENCE CHART (REF: AR 700-82/OPNAVIST4410.2, MCD 4400.129)					
SOURCE		MAINTENANCE		RECOVERABILITY	
1ST POS	2ND POSITION	3RD POSITION	4TH POSITION	5TH POSITION	
MEANS OF ACQUIRING SUPPORT					
P	A ITEM: STOCKED	USE: LOWEST LEVEL AUTHORIZED TO REMOVE/ REPLACE THE ITEM.	REPAIR: LOWEST LEVEL WITH CAPABILITY AND RESOURCES TO PERFORM COMPLETE REPAIR ACTION.	DISPOSITION: WHEN UNSERVICEABLE OR UNECONOMICALLY REPARABLE, CONDEMN OR DISPOSE.	S E R V I C E
	B ITEM: STOCKED, INSURANCE				
	C ITEM: STOCKED, DETERIORATIVE				
	D ITEM: SUPPORT, INITIAL ISSUE OR OUTFITTING & STOCKED ONLY FOR ADD'L INITIAL ISSUE				
	E EQUIPMENT: SUPPORT, STOCKED, INITIAL ISSUE OR OUTFITTING OF SPECIFIED MAINT ACTIVITIES				
	F EQUIPMENT: SUPPORT, NON-STOCKED, CENTRALLY PROCURED ON DEMAND				
	G ITEM: STOCKED FOR SUSTAINED SUPPORT. UNECONOMICAL TO PRODUCE AT LATER TIME				
	H ITEM: STOCKED, CONTAINS HAZMAT. HMIS/MDS REPORTING REQUIRED				
	Z TERMINAL OR OBS, NOT REPLACED				
K	D ITEM: DEPOT O/H & MAINTENANCE KITS	G	O	O	O
	F ITEM: MAINTENANCE KIT, PLACE AT O,F,I,L				
	R ITEM; IN BOTH DEPOT REPAIR & MAINT KITS				
M	Q MFG OR FAB AT UNITLEVEL	H	I/DS/AFLOAT OR THIRD ECHELON	F	I/DS/AFLOAT OR THIRD ECHELON
	F MFG OR FAB AT INTERMEDIATE/DS LEVEL				
	H MFG OR FAB AT INTERMEDIATE/GS LEVEL				
	L MFG OR FAB AT SPECIAL REPAIR ACTIVITY (SRA)				
	G MFG OR FAB AT BOTH AFLOAT AND ASHORE				
A	D MFG OR FAB AT DEPOT MAINTENANCE LEVEL	K	G	H	G
	O ITEM: ASSEMBLED AT UNIT				
	F ITEM: ASSEMBLED AT INTERMEDIATE/DS LEVEL				
	H ITEM: ASSEMBLED AT INTERMEDIATE/GS LEVEL				
	L ITEM: ASSEMBLED AT SRA				
X	G ITEM: ASSEMBLED AFLOAT OR ASHORE	L	SPEC. REPAIR ACTIVITY	D	D
	D ITEM: ASSEMBLED AT DEPOT MAINTENANCE LVL.				
	A ITEM: REQUISITION NEXT HIGHER ASSEMBLY				
	B ITEM: NOT PROCURED OR STOCKED. AVAILABLE THRU SALVAGE. REQ. BY CAGE/PART NUMBER				
X	C INSTALLATION DRAWING, DIAGRAM, INSTRUCTION SHEET. IDENTIFY BY CAGE/PART NUMBER	Z	REF ONLY	B	RECONDITION
	D NON-STOCKED. OBTAIN VIA LOCAL PURCHASE				

NOTE

Cannibalization or controlled exchange, when authorized, may be used as a source of supply for items with the above source codes, except for those source coded "XA" or those aircraft support items restricted by requirements of AR 750-1.

2. SMR Code – Maintenance

Maintenance codes (3rd and 4th position of the SMR Code) detail the category of maintenance authorized to USE and REPAIR support items. The maintenance codes are entered in the third and fourth positions of the SMR code as follows:

- 3rd Position: The maintenance code entered in the third position tells you the lowest maintenance category authorized to remove, replace, and use an item. Refer to SMR Position 3 Table (below) for an explanation of codes used in the 3rd position.
- 4th Position: The maintenance code entered in the fourth position tells whether or not the item is to be repaired, and it identifies the lowest maintenance category with the capability to do complete repair (that is, perform all authorized repairs). Refer to the SMR Position 4 Table (below) for an explanation of codes used in the 4th position.

NOTE

If authorized by the Maintenance Allocation Chart (MAC) and SMR codes, some limited repair may be done on the item at a lower category of maintenance.

Table 6-3 – SMR Position 3

Code	Explanation
O	Organizational or aviation unit category can remove, replace, and use the item.
F	Direct Support or aviation intermediate category can remove, replace, and use the item.
G	Remove/Replace ashore and afloat.
H	Ashore or fourth echelon.
K	Contractor Facility.
L	Specialized repair activity can remove, replace, and use the item.
D	Depot category can remove, replace, and use the item.

Table 6-4 – SMR Position 4

Code	Explanation
O	Organizational or aviation unit is the lowest category that can do complete repair of the item.
F	Afloat or Third Echelon.
G	Ashore and Afloat.
H	Ashore or Fourth Echelon.
K	Contractor Facility.
L	Specialized repair activity (designate the specialized repair activity) is the lowest category that can do complete repair of the item.
D	Depot is the lowest category that can do complete repair of the item.
Z	Non-repairable. No repair is authorized.
B	No repair is authorized. (No parts or special tools are authorized for the maintenance of a “B” coded item.) However, the item may be reconditioned by adjusting, lubricating, etc., at the user category.

3. SMR Code – Recoverability

Recoverability Codes (the 5th position of the SMR Code) are assigned to items to tell how to dispose of unserviceable items. The recoverability codes are explained in the following table.

Table 6-5 – SMR Position 5

Code	Explanation
Z	Non-repairable item. When unserviceable, condemn and dispose of the item at the category of maintenance shown in the third position of SMR Code.
O	Repairable item. When item is not economically repairable, condemn and dispose of the item at organizational or aviation unit category.
F	Repairable item. Afloat or Third Echelon.
G	Repairable item. Ashore and Afloat
H	Repairable item. Ashore or Fourth Echelon.
K	Repairable item. Contractor Facility
D	Repairable item. When beyond lower category repair capability, return to depot. Condemnation and disposal of item is not authorized below depot category.
L	Repairable item. Condemnation and disposal not authorized below Depot Level.
A	Item requires special handling or condemnation procedures because of specific reasons (for example, precious metal content, high dollar value, critical material, or hazardous material). Refer to the appropriate manuals and/or directives for specific instructions.

6.3 Special Tools List

Not applicable.

6.4 Cross-Reference Indexes

6.4.1 Included in the Cross-Reference Indexes

This section contains a Part Number Index on page 59 and a Figure Number Index on page 59. There are currently no items in the UxValidator IDS Line Test Set bill of materials that have a National Item Identification Number (NIIN) or National Serial Number (NSN); there is therefore no NSN-to-Figure Index at this time.

Figure Number Index

The Figure Number Index lists the figures in this manual that illustrate parts. For each figure, the descriptions of the items shown in that figure are listed, along with the corresponding part number for each item.

Part Number Index

The Part Number Index lists the manufacturer's part numbers. For each manufacturer's part number, the index tells the part's description, along with which figures the part is shown in.

6.4.2 Explanation of Columns in the Cross Reference Indexes

1. Part Number Column

Gives the primary number used by the manufacturer to identify an item.

2. Description Column

The description tells what the manufacturer calls the item.

3. Figure Column

Gives the number of the figure(s) where the item is shown.

4. NSN Column

There are currently no items in the UxValidator IDS Line Test Set that have an NSN.

NSNs that are missing from P-source-coded items have been applied for and will be added to this publication in a later revision.

Table 6-6 – Part Number Index

Part Number	Description	Figure	NSN
06-0105-85	IDS BrainPak	Figure 2-1, Figure 2-3, Figure 3-1, Figure 6-1	N/A
07-0210-02	IDS Pod	Figure 2-1, Figure 4-13, Figure 6-1	N/A
08-0412-04	5' Hi-Speed Data Cable	Figure 2-1, Figure 6-1	N/A
08-0707-01	4' Temperature Probe Harness	Figure 2-1, Figure 6-1	N/A
09-1204-19	IDS Self-test Harness	Figure 2-1, Figure 6-1	N/A
09-0113-05	Transit Case	Figure 2-1, Figure 6-1	N/A
07-0601-02	Maintenance Manual	Figure 2-1, Figure 6-1	N/A
07-0601-01	User's Manual	Figure 2-1, Figure 6-1	N/A

Table 6-7 – Figure Number Index

Figure	Part Number	Description	NSN
Figure 2-1	06-0105-85 07-0210-02 08-0412-04 08-0707-01 09-1204-19 09-0113-05 07-0601-02 07-0601-01	IDS BrainPak IDS Pod 5' Hi-Speed Data Cable 4' Temperature Probe Harness IDS Self-test Harness Transit Case Maintenance Manual User's Manual	N/A
Figure 2-3	06-0105-85	IDS BrainPak	N/A
Figure 3-1	06-0105-85	IDS BrainPak	N/A
Figure 4-13	07-0210-02	IDS Pod	N/A
Figure 6-1	06-0105-85 07-0210-02 08-0412-04 08-0707-01 09-1204-19 09-0113-05 07-0601-02 07-0601-01	IDS BrainPak IDS Pod 5' Hi-Speed Data Cable 4' Temperature Probe Harness IDS Self-test Harness Transit Case Maintenance Manual User's Manual	N/A

6.5 How to Find or Confirm the Part Number of Repair Parts

6.5.1 NSN or Part Number Not Known

If the NSN or Part Number of the item required is not known, use the following procedure to locate repair parts:

1. Using the table of contents, determine the assembly group or subassembly group to which the item belongs. This is necessary since figures are prepared for assembly groups and subassembly groups, and listings are divided into the same groups.
2. Find the figure covering the assembly group or subassembly group to which the item belongs.
3. Identify the item on the figure and note its item number.
4. Refer to the Repair Parts List for the figure. Find the part number given for that item number.
5. Refer to the Part Number Index to see if there is an NSN assigned to that part.

6.5.2 NSN or Part Number Is Known

When the NSN or Part Number of the item is known, use the following procedure to confirm the part number of repair parts:

1. Look in the Part Number Index for the part number of your item. The Part Number Index will cross-reference you to the figure and item number of the item you are looking for.
2. After finding the figure number and item number, verify that the item and its corresponding part number is the one you're looking for.

6.5.3 Part Numbers of ULTRAX Parts

ULTRAX parts are manufactured with the ULTRAX part number engraved on the part or securely affixed to the part. However, if the part number becomes damaged or otherwise obscured, determine the correct part number by referring to the parts lists on page 14 and page 52 (and the accompanying drawings) or to the Components Of the End Item list on page 62.



Appendix A Components Of the End Item and Basic Issue Items

SCOPE

To help you maintain proper inventory for the various parts of the equipment, this appendix addresses the Components Of the End Item (COEI) list and the Basic Issue Items (BII) list for the UxValidator IDS Line Test Set.

Components of the End Item (COEI) List:

This list is for information only, and is not authority to requisition replacements. These items are part of the UxValidator IDS Line Test Set. As part of the end item, these items must be with the end item whenever it is issued or transferred between property accounts. Items of COEI are removed and separately packaged for transportation or shipment only when necessary. Illustrations are furnished to help you find and identify the items.

Basic Issue Items (BII) List:

N/A.

EXPLANATION OF COLUMNS

Column 1 – Illustration

A drawing of the item is shown.

Column 2 – National Stock Number

Indicates the National Stock Number assigned to the item. This number is used to requisition the item.

Column 3 – Description

Gives a minimum description to identify and locate the item. The last line for each item indicates the Federal Supply Code for Manufacturer (CAGEC) in parentheses, followed by the part number. If the item you need is not the same for different models of the equipment, a Usable-On Code will appear on the right side of the description column on the same line as the part number.

Column 4 – Unit of Measure (UM)

Indicates the unit of measure that applies to the item's quantity. A two-letter abbreviation (for example, EA, in, PR) is used to indicate the unit of measure.

Column 5 – Quantity Required (Qty Rqr.)

Indicates how many of an item is authorized to be used with or on the equipment.

Components Of the End Item

Illustration	NSN	Description	U/M	Qty Req'd
	N/A	IDS BrainPak (07PR7) 06-0105-85	EA	1
	N/A	IDS Pod (07PR7) 07-0210-02	EA	2
	N/A	5' Hi-Speed Data Cable (07PR7) 08-0412-04	EA	2
	N/A	4' Temperature Probe Harness (07PR7) 08-0707-01	EA	1
	N/A	IDS Self-test Harness (07PR7) 09-1204-19	EA	1
	N/A	TM 1-1520-234-23 (User's Manual) (07PR7) 07-0601-01	EA	1
	N/A	Maintenance Manual (07PR7) 07-0601-02	EA	1
	N/A	Transit Case (07PR7) 09-0113-05	EA	1

Recommended Changes to Technical Publications

From		Date
Publication Number	Publication Date	Publication Title

PLEASE be exact; pin-point where it is.

Page Number	Para-graph	Figure Number	Table Number	Tell us what is wrong and how to fix it, or describe your recommended change.

Printed Name, Grade, or Title, Telephone Number, and Email Address <hr style="border: 0; border-top: 1px solid black; margin: 5px 0;"/> <hr style="border: 0; border-top: 1px solid black; margin: 5px 0;"/> <hr style="border: 0; border-top: 1px solid black; margin: 5px 0;"/>	SIGN HERE
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