ADSETUPW

Version 1.00

User Manual

Airdata/DigiData Configuration Utility

for

PC Windows Win32 compatibles

Rev. B

6831 OXFORD STREET, ST. LOUIS PARK, MINNESOTA 55426-4412, U.S.A

PHONE: 952-927-6500 FAX: 952-924-1111

WWW.SHADIN.COM

Table of Contents

Section **Contents** **Page**

1. Hardware Setup 3

2. Overview 4

3. Getting Started 4

3.1 Connecting to the target hardware 4
3.2 Using ADSETUPW to change the Current Airdata/Digidata Configuration 6
3.3 Configuration Parameter Selection Options for AIRDATA 10
3.4 Configuration Parameter Selection Options for DIGIDATA 11
3.5 Entering the OAT Probe Calibration values into ADSETUPW 11
3.6 Programming new configuration settings 13

4. Diagnostics Page 14

5. Trouble Shooting Procedure 16

6. Additional Wiring Harnesses 17

7. Revision Log 18

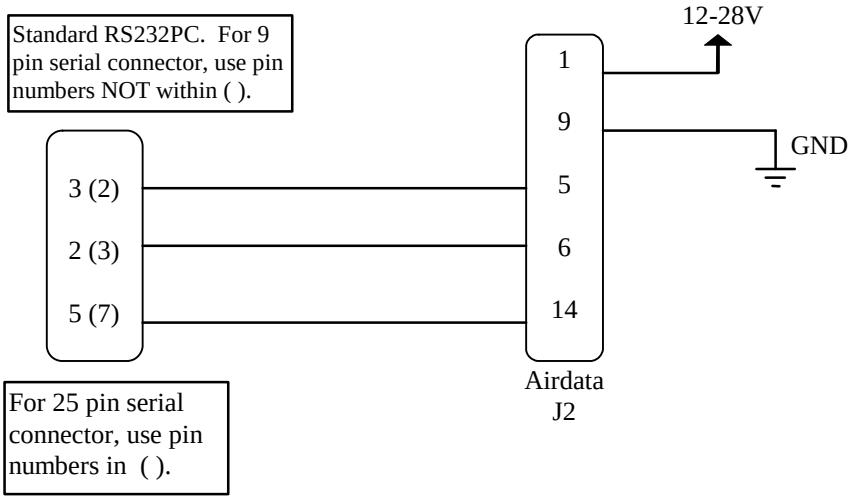
Table of Figures

Figure 1 Hardware Setup 3
Figure 2 Communication Port Selection 5
Figure 3 ADSETUPW main configuration screen with Baud Rate selection 5
Figure 4 Serial connection progress dialogue 6
Figure 5 Serial communciations not established 6
Figure 6 ADSETUPW configuration Setup screen for AIRDATA 7
Figure 7 ADSETUPW configuration Setup screen for DIGIDATA 8
Figure 8 Configuration parameter options for AIRDATA 10
Figure 9 Configuration parameter options for DIGIDATA 11
Figure 10 ADSETUPW programming progress dialogue 13
Figure 11 Diagnostics Display Screen 14
Figure 12 Additional Wiring Harnesses 17

1. Hardware Setup

The PC must be connected to the Airdata/Digidata via a serial port. The correct wiring from the PC to Airdata/DigiData is described in Figure 1 below. See Figure 12 if you wish to manufacture a harness for on-board aircraft programming.

Airdata ADC 200/2000



DigiData

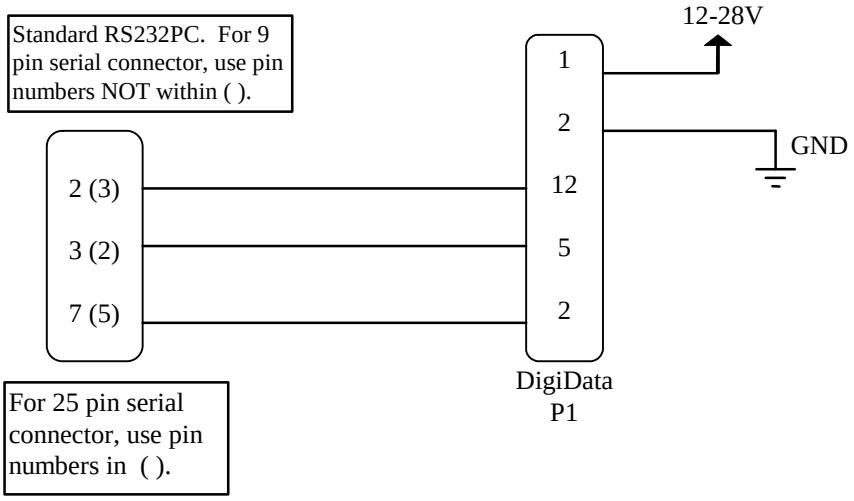


Figure 1 Hardware Setup

2. Overview

The Shadin Avionics Windows Airdata/Digidata Configuration Utility (ADSETUPW) is an IBM compatible Windows application used to set the Airdata hardware P/Ns 962820( ), 962830( ) or Digidata 9128xx configuration options to best suit the needs of your installation. See Figure 8 for a complete list of Airdata configuration parameters and Figure 9 for a complete list of Digidata configuration parameters and selection options available.

ADSETUPW will automatically detect if it is connected to an Airdata or a DigiData and allow the appropriate configuration editing capabilities. ADSETUPW will detect the software version which will allow configuration of Airdata and Digidata's based on features available in that version of software.

For a full description of these configurable options and functions see your Airdata or Digidata Installation manual.

3. Getting Started

ADSETUPW.exe is a self contained executable application which does not need to be installed as a Windows program. This application may be run from any storage media or disk drive that is appropriate for the users computer system.

Open the Windows Explorer found at Start > Programs > Accessories > Windows Explorer.

Power on the target hardware connected to the PC as defined in Figure 1. Wait for about 1 minute for the target hardware to initialize and enter normal operational mode. Navigate in the Explorer to the directory where ADSETUPW.exe resides and double click on *ADSETUPW.exe*.

3.1 Connecting to the target hardware

The '*Select COM Port*' dialogue box in Figure 2 will be displayed. Use mouse or keyboard arrow to select the appropriate Comm Port for connection to Airdata/Digidata.

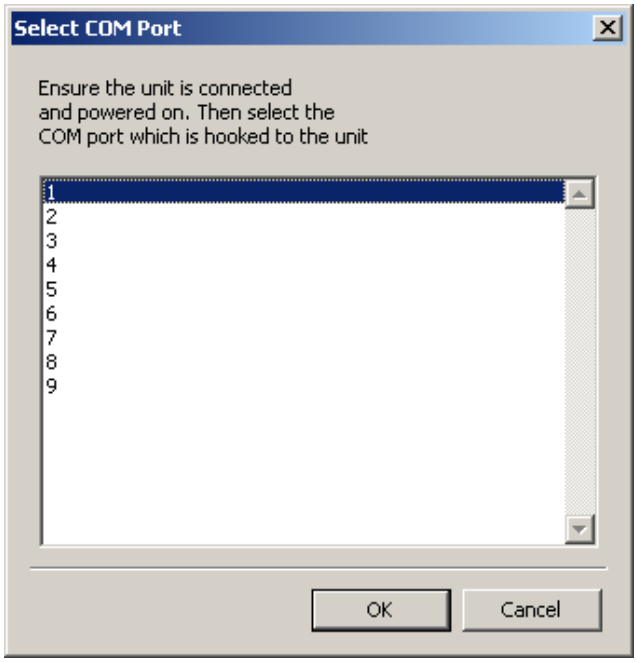


Figure 2 Communication Port Selection

The ADSETUPW will then display the Baud Rate dialogue shown in Figure 3. Click on one of the baud rate selection buttons to establish a serial connection to the target hardware. The application will cycle through the baud rates of 9600, 4800, 2400, and 1200 when necessary to auto-detect the baud rate that the Airdata or Digidata target hardware is configured to.

Figure 3 ADSETUPW main configuration screen with Baud Rate selection

The ADSETUPW connection progress dialogue screen in Figure 4 will be displayed when attempting to establish serial communication to the Airdata/Digidata target hardware.

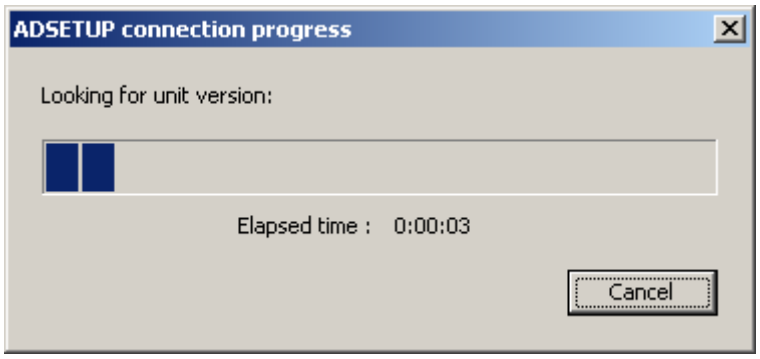


Figure 4 Serial connection progress dialogue

If a connection process is not established, the dialogue box in Figure 5 may be displayed. Check the serial cable connections and verify that the correct comm port has been selected. You may abort the connection process by pressing the *Cancel* button on the dialogue box.

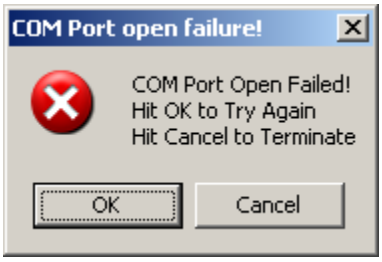


Figure 5 Serial communciations not established

3.2 Using ADSETUPW to change the Current Airdata/Digidata Configuration

After the serial connection is made and the Airdata/Digidata header information is received and recognized, the Figure 6 or Figure 7 ADSETUPW configuration setup screen will be displayed.

You may navigate around ADSETUPW with either a Mouse, or the Keyboard. The keyboard interface supports the use of the arrow keys, and “hot” keys. Hot keys are those letters you see highlighted on the menus when the ALT key to pressed.

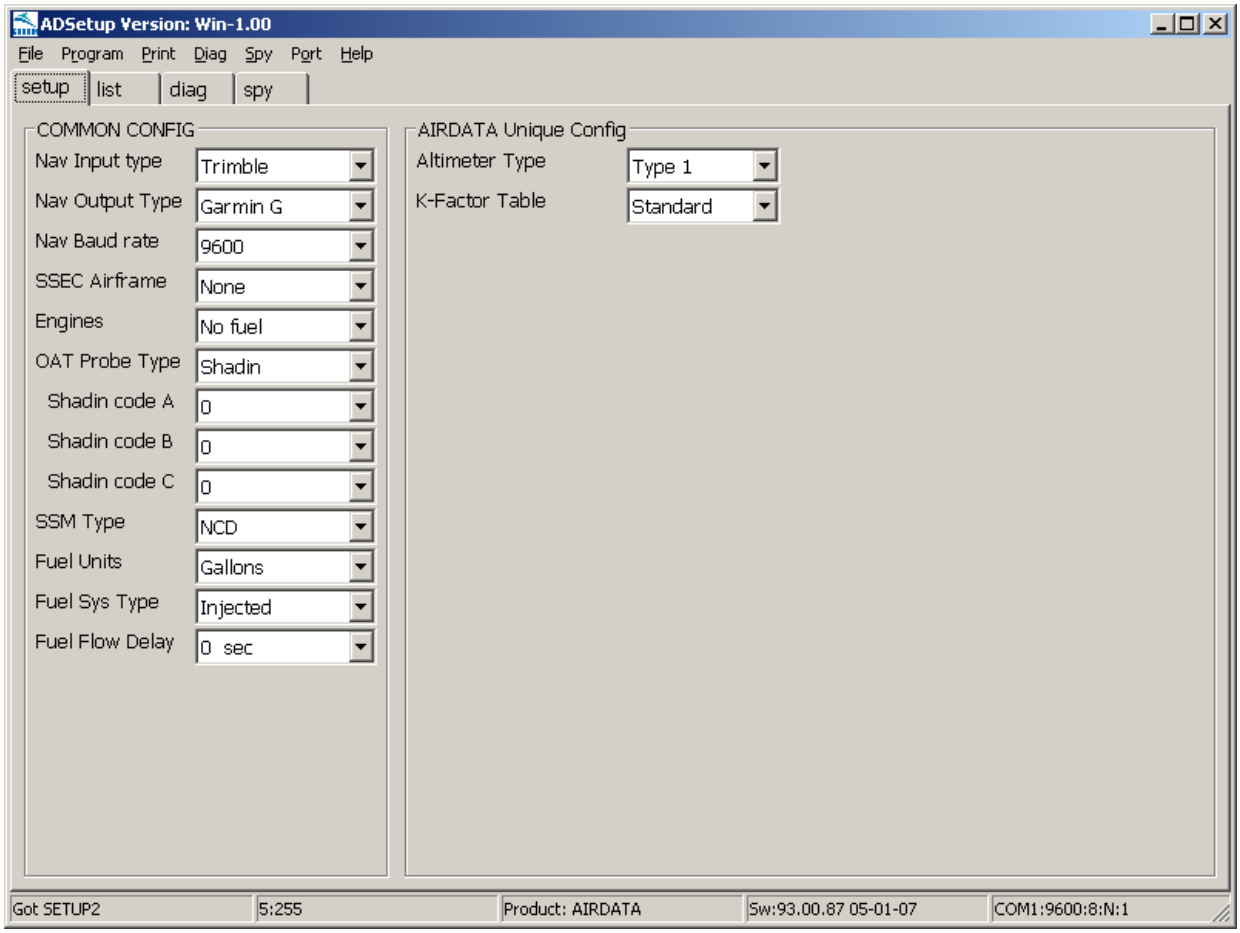


Figure 6 ADSETUPW configuration Setup screen for AIRDATA

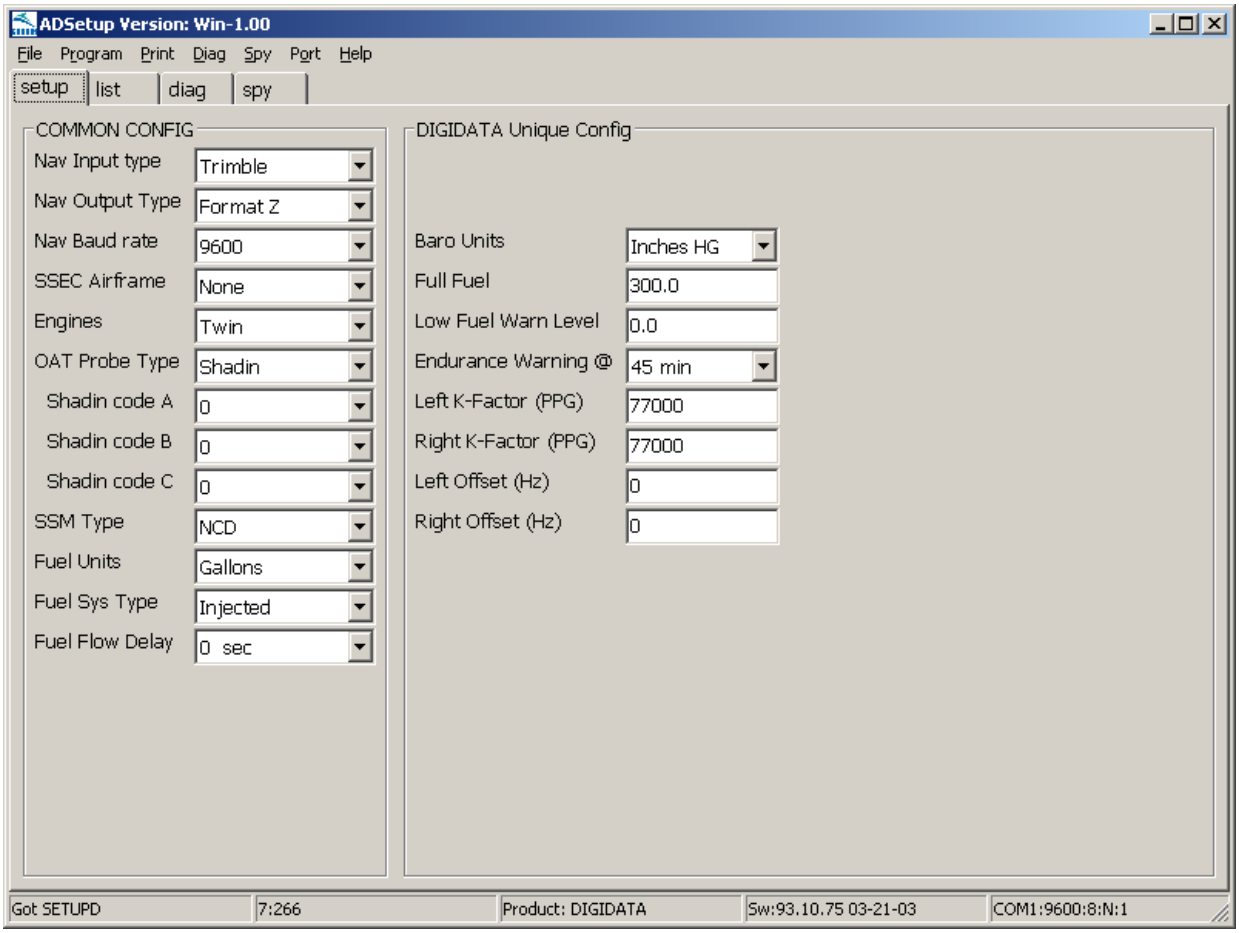


Figure 7 ADSETUPW configuration Setup screen for DIGIDATA

MENU ITEMS

1. File
   - **Print** – Print the current configuration. Hardware Part number and Serial number entry fields available for printing on current configuration.
   - **Exit –** Exit the ADSETUPW program.
2. Program
   - **Send (Edit)** – Program the Airdata/DigiData with the parameter settings on the Setup screen.
   - **Request** – Retrieve the current configuration from the Airdata/DigiData and display it on the 'Setup' tab window.
   - **Reboot** – Reset/Restart the Airdata/DigiData (similar to powering off, then restarting)
   - **Online** – Send a query command to determine if target is 'online'.
3. Print - Print the current configuration. Hardware Part number and Serial number entry fields available for printing on current configuration.
4. Diagnostics
   - **Diag –** Displays diagnostic data in the 'Diag' tab window. Lists all airdata (PALT, IAS, ...), error codes, software version information and raw data input values. Useful for diagnosing why a particular data item is not available. This is also a useful way to view the airdata without a navigational receiver connected.
   - **Freq** – 700kHz Airdata and 750kHz Digidata fuel flow clock frequency test display.
5. Spy – Simply a terminal that displays the serial data transmitted by the Airdata/Digidata at the last known baud rate in the 'Spy' tab window.
6. Port
   - **Open** – Open serial communication port to the target.
   - **Close** – Close serial communications port to the target.
   - **Baud Rate** – Select the serial connection baud rate. (for next open after a close if configuration baud rate is changed) Does not change baud rate of current active connection.
   - **Comm Port Selection** – Select the PC comm port 1-9 that is connected to the target.
7. Help **–** Display the ADSETUPW version information.

3.3 Configuration Parameter Selection Options for AIRDATA

The selections available for each parameter are as follows:

Nav Input type	Nav Output type	Fuel Units	SSEC Airframe
Trimble	Format Z	Gallons	None
Arnav	Format X	Liters	MU-300
Bendix	Generic	Lbs 5.8	Citation 501
Garmin	Surveyor	Lbs 6.7	Cessna 525
Northstar	Bendix C	Kilos	Cessna 560a
Foster	Bendix D	Lbs 6.5	Cessna 560b
IIMorrow	Shadin S	Lbs 6.35	Cessna 650
Flow Meter	Bendix B		Saber 65
	Garmin G[1]		WestWind
			Lear 24
Engine type	**OAT Probe type**	**OAT calibration[2]**	HS125-3A
Single	Shadin	A: 0 – 15	Falcon 20-F
Twin	Rosemont 1	B: 0 – 15	Falcon 20-CDE
No Fuel[3]	Rosemont 2	C: 0 – 15	Lear 25D
			Douglas DC8
Nav Baud rate[4]	**SSM type**	**Fuel Flow Delay**	Beech 400
9600	OK	0 Seconds	707 321BA
4800	NCD	5 Seconds	Citation S550
2400		10 Seconds	Falcon 10
1200	**Fuel Filter type**	15 Seconds	Falcon 50
	Injector	20 Seconds	125-700A
Altimeter type[5]	Carburetor	25 Seconds	Lear35
None		30 Seconds	Lear55
Type 1 - 11		35 Seconds	Saber 60
		40 Seconds	JetStar 2
K-Factor table		45 Seconds	Antonov 12[6]
Standard			Antonov 24
Alternate			Antonov 26
			Antonov 30
			YAK 40

Figure 8 Configuration parameter options for AIRDATA

[1] Airdata software versions 93.05.xx and 93.06.xx do not have Garmin G.

[2] OAT calibration was added to Airdata version 93.0(0,2,3).81, 93.04.xx, 93.05.xx but not 93.06.xx. See section 3.5 on entering OAT Probe Calibration values.

[3] The Engine Type 'No Fuel' may only be selected for AIRDATA with Nav Output Type of 'Garmin G'. The 'No Fuel' selection is not in Airdata software versions of 93.05.xx, 93.06.xx or versions less than for 93.00.77, 93.02.77 and 93.03.77.

[4] Ensure that the Nav Baud Rate selected for the Airdata matches the baud rate of the GPS selected in Nav Input Type.

[5] Altimeter type 11 was added to Airdata version 93.0x.78, 93.04.xx, 93.06.03 and Digidata version 93.10.74. Sw version 93.05.xx does not have Altimeter type 11.

[6] These SSEC types are only valid for software versions 93.00STx and 93.00.84+.

3.4 Configuration Parameter Selection Options for DIGIDATA

The selections available for each parameter is as follows:

Nav Input type	**Nav Output type**	**Fuel Units**	**SSEC Airframe**
Trimble	Format Z	Gallons	None
Arnav	Format X	Liters	MU-300
Bendix	Generic	Lbs 5.8	Citation 501
Garmin	Surveyor	Lbs 6.7	Cessna 525
Northstar	Bendix C	Kilos	Cessna 560a
Foster	Shadin S	Lbs 6.5	Cessna 560b
IIMorrow	Bendix B	Lbs 6.35	Cessna 650
Flow Meter	Garmin G		Saber 65
			WestWind
Engine type	**OAT Probe type**	**OAT calibration**[1]	Lear 24
Single	Shadin	A: 0 – 15	HS125-3A
Twin	Rosemont 1	B: 0 – 15	Falcon 20-F
	Rosemont 2	C: 0 – 15	Falcon 20-CDE
			Lear 25D
Nav Baud rate[2]	**SSM type**	**Fuel Flow Delay**	Douglas DC8
9600	OK	0 Seconds	Beech 400
4800	NCD	5 Seconds	707 321BA
2400		10 Seconds	Citation S550
1200	**Fuel Filter type**	15 Seconds	Falcon 10
	Injector	20 Seconds	Falcon 50
Baro Units	Carburetor	25 Seconds	125-700A
Inches Hg		30 Seconds	Lear35
Millibars	**Endurance**	35 Seconds	Lear55
	45 minutes	40 Seconds	Saber 60
Entry fields:	10 minutes	45 Seconds	JetStar 2
Full Fuel amount	15 minutes		
Low Fuel Level	20 minutes		
Left K-Factor (PPD)	25 minutes		
Right K-Factor (PPD)	30 minutes		
Left Offset (Hz)	35 minutes		
Right Offset (Hz)	40 minutes		

Figure 9 Configuration parameter options for DIGIDATA

3.5 Entering the OAT Probe Calibration values into ADSETUPW

OAT temperature calibration was added to Airdata version 93.0(0,2,3).81, 93.04.xx, 93.05.xx and Digidata software version 93.10.75. The Airdata /Digidata uses a standard OAT probe with a variable range of tolerances. Some probes may require the entry of three calibration values: Shadin code A, B, and C (refer to Figure 6 or Figure 7). If the OAT probe is marked with a group of 3 letters and numbers, as shown below, calibration correction values must be

[1] OAT calibration was added to Digidata version 93.10.75. See Section 3.5 on entering OAT Probe calibration values.

[2] Ensure that the Nav Baud Rate selected for the Airdata matches the baud rate of the GPS selected in Nav Input Type.

entered. (Note: the numbers shown below are only examples. Refer to your Shadin OAT probe for actual values.)

A=06 B=04 C=D

The ADSETUPW program will only displays numerical value selections in the three configuration parameters fields: Shadin code A, B, and C. Some OAT probe may have letter values such as is given in the example above for C=D. Refer to the table below for the decimal value equivalent selection for the letter values A thru F.

Value on OAT Probe	Value selected in 'Shadin Code' field
01	1
02	2
03	3
04	4
05	5
06	6
07	7
08	8
09	9
A	10
B	11
C	12
D	13
E	14
F	15

In the example given above, the user would enter 6 in 'Shadin code A', 4 in 'Shadin code B', and 13 in 'Shadin code C' fields.

3.6 Programming new configuration settings

To Program: Make the parameter selection changes on the setup screen.(Refer to Figure 8 for Airdata and Figure 9 for Digidata and Sect 3.5 if OAT calibration is required). Select *Send* from the *Program* menu and programming progress dialogue in Figure 10 will appear showing the progress of programming the Airdata/Digidata with the current parameter setting on the *setup* screen. The *spy* screen should also confirm 'writing to EE' and 'written' for each configuration string sent.

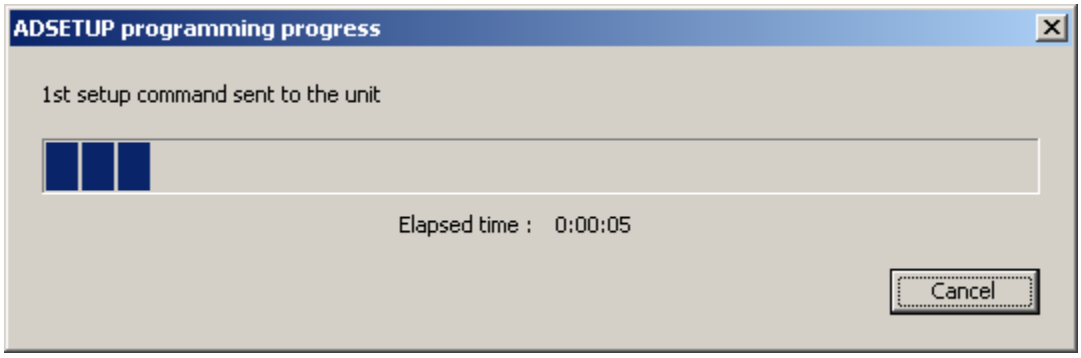


Figure 10 ADSETUPW programming progress dialogue

Select *Reboot* from the *Program* menu or cycle power off and on to activate the new configuration setting.

Selecting *Request* from the *Program* menu will read the current configuration from the target hardware.

4. Diagnostics Page

Select *Diag* from the *Diag* menu and the Figure 11 screen will be displayed.

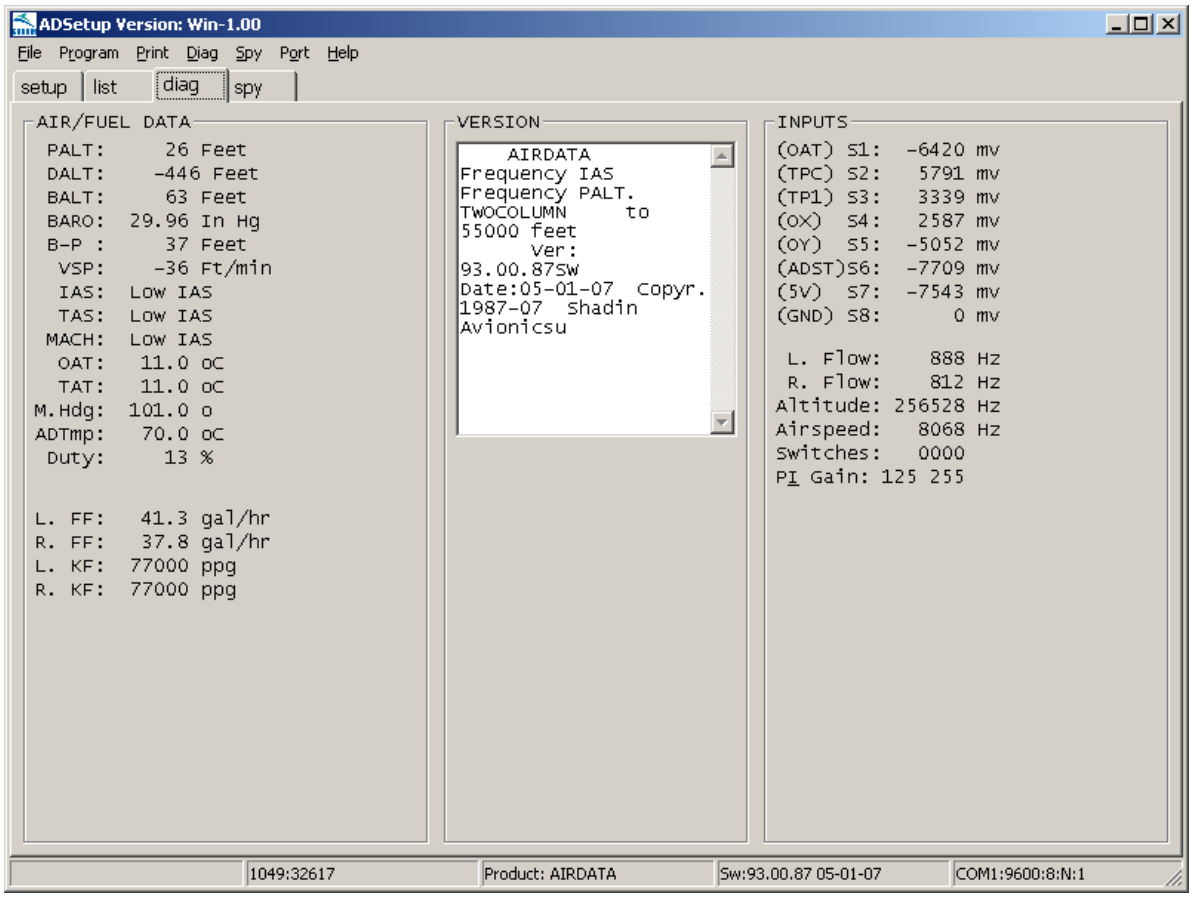


Figure 11 Diagnostics Display Screen

The Diagnostics page will allow the ADSETUPW user to interrogate/monitor the real-time operational mode input/output values of the Airdata/Digidata.

The left column displays are PALT (Pressure Altitude), DALT (Density Altitude), BALT (Barometric Altitude), BARO (Barometric Pressure), B-P (Barometric Altitude minus Pressure Altitude), VSP (Vertical Speed in feet per minute), IAS (Indicated Air Speed), TAS (True Air Speed), MACH (% of the speed of sound), OAT (Outside Air Temperature), TAT (True Air Temperature), M.Hdg (Magnetic Heading), ADTmp (Airdata Temperature Sensor), Duty (Duty Cycle of the Airdata heater), L. FF (Left Fuel Flow), R. FF (Right Fuel Flow), L. KF (Left K-Factor), and R. KF (Right K-Factor).

In the middle column is displayed software version information.

Select *Freq* from the *Diag* menu to perform a Freq. test. The Frequency Test tests the Airdata/Digidata's ability to accurately read a clock frequency of 700 kHz for Airdata and 750 kHz for Digidata.

The third column displays raw input values. The values will be dashed unless communication has been established with the Airdata/Digidata.

5. Trouble Shooting Procedure

1. If after the initial installation, the ADSETUPW program is invoked and the airdata is connected, the program continues to keep searching for a correct baud rate to establish a serial connection:
    1. Verify that you have the correct pins connected to the PC. If connecting to a 9-pin PC port, use the 9-pin wiring. If connecting to a 25-pin PC port, use a 25-pin connector. See Figure 1.
    2. Verify you are connecting to the correct airdata product. The ADC-200/2000 has the same wiring while the Digidata uses a different pin configuration on the Digidata P1. See Figure 1.
2. Software version supported by this application are 93.0(0,2,3).79+, 93.04.xx, 93.05.xx, 93.06.xx with HW P/Ns 962820-X or 962830-X and Digidata 93.10.74 & .75 with HW P/Ns 912802.
3. The following early Airdata and Digidata products are not ADSETUPW configurable.
    1. ADC with hardware P/N's of: 962803-X-1-35 or 962801-1-2-55.
    2. Airdata software versions before 93.00.79, 93.02.79, 93.03.79.
    3. Airdata versions 93.60.xx, 93.62.xx, 93.64.xx, 93.65.xx are not supported.
    4. Digidata version before 93.10.74

6. Additional Wiring Harnesses

Manufacture the following harness if you wish to run ADSETUPW on the aircraft using a laptop computer. Be sure to power OFF your aircraft power buss prior to plugging and unplugging the Shadin Airdata product!

This harness will allow the user to see what the ADC is computing real-time in the diagnostics mode (OAT, Heading, Fuel Flow, Pressure Altitude, Indicated Airspeed, Density Altitude, Baro setting on ADC-2000). This harness will also allow you to use the aircraft's existing power to drive the ADC.

On-aircraft ADSETUPW Harness for ADC-200/2000

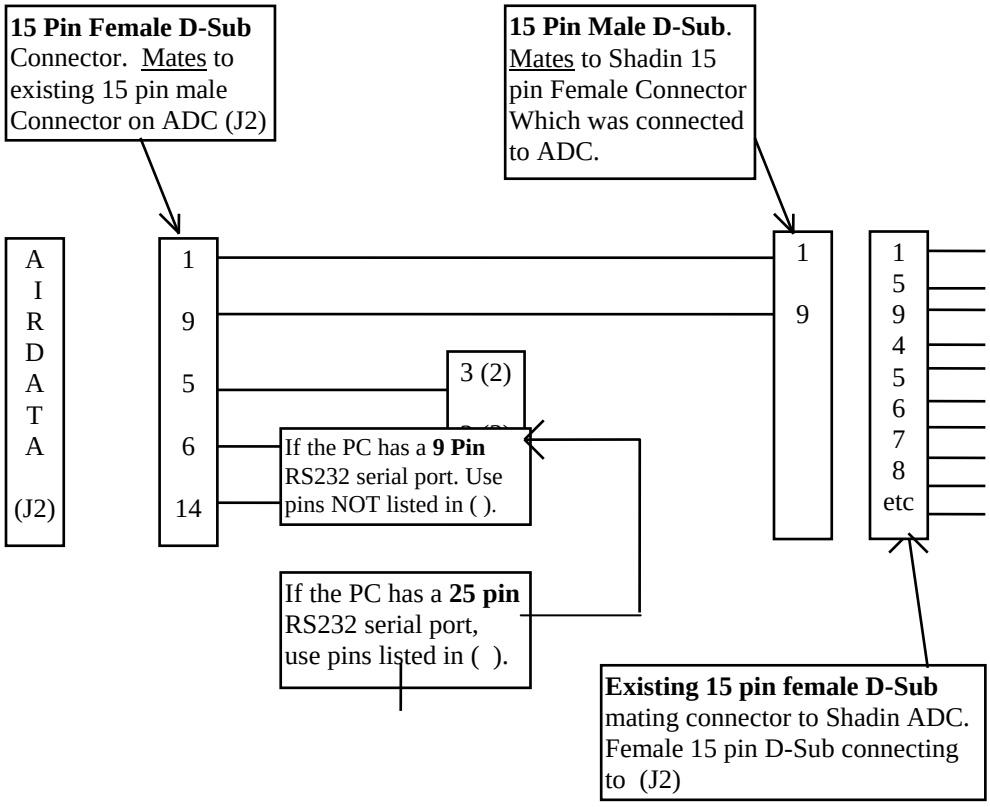


Figure 12 Additional Wiring Harnesses

7. Revision Log

Rev	Date	Author	Description
–	Mar 20, 2007	Glenn Miller	Initial Version
A	Jan 23, 2008	Glenn Miller	Updated to current ADSetupw 1.00 current software capabilities.
B	Jan 30, 2008	Glenn Miller	Added section 3.5 Entering OAT probe calibration values; Added Report heading. Reformatted level 2 heading labels.