EDR 3C Programming Guide

By Tom Irvine Email: tomirvine@aol.com

November 2, 2006

Programming the EDR



Figure 1. EDR-3C Unit with Cover Removed

- 1. Verify that the unit is a model 3C according to the vendor's label.
- 2. Verify that the EDR unit is in CAL according to the Orbital label.
- 3. Remove cover.
- 4. Verify that the four C-cell batteries are good. Replace batteries if there is any doubt.
- 5. Connect EDR unit to the PC via a 9-pin serial cable.
- 6. The Toggle switch on the left side should be pointed down for communication between the PC and the EDR unit.

Down position = COM on Up position = COM off

7. Run program Edr3ccom.



8. Go to Wizards > Download Data

ownload Wizard	EDR Sta	atus		
EDR Do	wnload Wiz	ard EDR30	C #1579 on Com 1	
EEPRON	4 Calibration	n Date: Mor	n Feb 20 11:16:18 2006	7
Unit Number:	1	1579	Humidity:	0.0
Internal Temp	perature:	25.4	Battery Volts	5.762
External Tem	perature:	-272.1	The Unit time is:	November 1, 2006 10:02:20 am
Dew Point:		-18.0	The PC time is:	November 1, 2006 10:02:14 am
Triggered:		65535	Number of Windo	ws: 1
Events:		40	Temperatures Sto	red: 195
Kbytes Used:		79.28	KBytes Free:	912.47

Figure 2.

- 9. Verify that you see a status screen similar to the one shown in Figure 2.
- 10. Next > save existing data if desired.
- 11. Go to Wizards > Setup Recorder > Next

Please choose either a quick setup or advanced setup Quick Start © Quick Start <u>S</u> hock © Quick Start <u>V</u> ibration	o parameters. ● <u>A</u> dvanced Setup Parameters
Quick Start	 Advanced Setup Parameters
 Quick Start <u>Shock</u> Quick Start <u>V</u>ibration 	Advanced Setup Parameters
C Quick Start <u>V</u> ibration	
Quick Start Drop Height	
C Quick Start <u>M</u> ixed Mode	
C Quick Start <u>T</u> ape Recorder	Load setup from file
	Eogg scop non nic

Figure 3.

12. Select "Load setup from file." The setup file: shipment2.rcp will be used as an example. Select this file and click Next.

13. The next screen is User Documentation. You can add notes about the shipment but this is optional.

	EDR Setup Wizard Event Definitio	n	<u>?×</u>
	EDR Setup Wizard	EDR3C #1579 on Com 1	
83%	Pre-trigger length (samples): III Post-trigger length (samples): 330 Maximum length (samples): 340 Dead time after event (sec): 0.142 Sample rate (Hz): 400.00 Recording Mode 0	250.0 (ms) 8250.0 (ms) 8500.0 (ms) •	
	Overwrite Parameters Number of windows: 5 Time per window: 0 Se	Events per window: 11 econds 0 Minutes 0 Hours 1 Days < Back Next > Canc	

Figure 4.

- 14. This screen has very important information. The bar on the left is at 93%. This is the projected memory usage. This bar should be just under 100%. The EDR unit will continually acquire data, but it will only store data for triggered events. The trigger threshold levels are set in a later screen. The Pre-trigger length, Maximum length, Dead time, and Sample rate should each be left as shown for most shipments. Each record will thus have a total duration of 11 seconds with a sample rate of 400 samples per second.
- 15. The Recording Mode should be left in Overwrite. This mode ranks and retains the records with the highest peak levels.
- 16. The EDR is currently set up to record 5 windows with 11 Events (or records) per window with 1 day per window. These parameters can be changed depending on the shipping schedule. Separating the data into windows is a good idea if, for example, there are different shipping modes with the goal of getting at least a few records for each mode. Separating the data into windows can also be used to help exclude non-transportation related handling of the EDR unit.

	EDR Setup Wizard Triggering	لگ. E on Com 1
03%	X Y Z Trigger level: 0.180 0.180 0.180 Trigger Units: g g g Trigger Units: g g g Trigger duration (samples): 0 0 0 Trigger duration (ms): 0.0 0.0 0.0 Trigger Sources Image: Y Image: Z Image: Z Triggering Options Image: Trigger on external trigger input Image: Trigger when temp. sample is taken Image: Trigger only	Image: Durputs Image
	<u>.</u>	< Back Next > Cancel

Figure 5.

- 17. The Trigger level is setup for 0.180 G for each channel. All channels will be recorded if any one of the channels is triggered. The 0.180 G level is probably appropriate for most shipments. Again, the EDR was set to Overwrite mode on the previous screen. So the EDR software will rank the triggered events and only retain the events with the highest levels within a given window.
- 18. Next > Ignore Temperature and Humidity screen.
- 19. Next > Sensitivity values are pre-set at Factory if the unit has internal accelerometers.

EDR Setup Wizard EDR3C #1579	on Com 1	
Use relative times	C Use <u>fixed</u> times	
Start Delay: (delay from when parameters are sent to unit) Days: 0 Hours: 0.00	Start Time: (HH:MM:SS MM-DD-YYYY) 11:38:50 11-01-2006	
Test Length: (time the unit remains in active mode) Days: 883 Hours: 17.71	Stop Time: (HH:MM:SS MM-DD-YYYY) 05:21:25: 04:03-2009	
	Start when sending setup	

Figure 6.

- 20. This screen shows that there is zero delay once the EDR unit is activated. i.e. It will begin acquiring data right away. The Test Length is unimportant as long as it is set to some arbitrarily high number of days. The true Test Length is constrained by the number of Windows and Time per Window.
- 21. The Start Delay parameter can be set for a delay if, for example, the transportation is scheduled for two weeks after the EDR is programmed. This is "Tempting Fate," however. The EDR should be programmed as close to the actual transportation event as possible for the sake of reliability.
- 22. Click on Send & Start.
- 23. A warning message will appear if there is already stored data on the EDR, because the data will be erased if the user selected Yes. So choose either Yes or No as appropriate. The method for downloading stored data is given in Appendix A.
- 24. You may "Save setup to disk" if you have changed any of the setup parameters. The setup file will have a *.rcp extension.
- 25. Click Finish. The EDR is now actively acquiring data, but you need to double-check this.
- 26. Remove the cable from the EDR unit.
- 27. Set Toggle switch up for COM off.

- 28. Press and release the button next to the toggle switch several times. Verify that the ACT LED lights up briefly each time. If so, this is a good sign.
- 29. Take the EDR unit in your hand and jiggle it. The ACT LED should light briefly a few seconds after the first jiggle. If so, this is a good sign, although it wastes a record or two.
- 30. As an optional step, you may now download the jiggle data per the procedure in Appendix A for verification purposes. Then repeat steps 1 through 26. This may seem unnecessary, but "obsessive compulsive disorder" is a helpful trait in this situation.
- 31. Finally, replace the EDR cover for final use.

APPENDIX A

Downloading Data from the EDR

- 1. Remove the cover from the EDR.
- 2. Connect the EDR unit to the PC with the serial cable.
- 3. Set Toggle switch to down for COM on.
- 4. Run program Edr3ccom.



- 5. Wizards > Download Data > Next > Next > Next
- 6. Save data. The data file will have a *.udf extension.
- 7. See Appendix B for post-processing data.

APPENDIX B

Post-processing Data

1. Open the Dynamax software.



- 2. File > Open: located *.udf file.
- 3. Select Multiwave View



- 4. Preferences > Set Units > G.
- 5. Right mouse click against lime green background behind waveforms.
- 6. Channels > Channel Selection > Click X, Y & Z.
- 7. Right mouse click against lime green background behind waveforms in the section with the three superimposed waves.
- 8. Export > To File > All visible Events
- 9. Save acceleration data as ASCII text file.
- 10. Send text file to Tom Irvine for further post-processing. Or you can send the raw *.udf file.
- 11. Also, use the Event Table icon to check time of occurrence for each event. This can be used to determine which events are due to handling of the EDR unit before and after the actual shipment.

Please contact me if you have any questions.

Tom Irvine

Office: 480-814-6439 Home: 480-752-9975

Email: tomirvine@aol.com