MarathonNorco Aerospace®

CHRISTIE®

A Division of MarathonNorco Aerospace, Inc.

PROEASE™ DATAFX

Battery Performance Data Acquisition System

Features and Benefits

- Use with any charger/analyzer worldwide
- Designed for nickel-cadmium and lead-acid batteries
- Automatically scans nickel-cadmium batteries, acquiring information on individual cells
- Large display shows all cell voltages, battery current and voltage, and sources of faults
- Cells with faults flash on/off
- Self-calibration to ensure continued accuracy
- Inductive current sensor—no need to "hard wire"

The Data Acquisition System

The Christie® ProEase DATAFX is the most versatile and affordable cell and battery data acquisition system available. Designed and built by the Christie® division of MarathonNorco Aerospace it automatically provides a complete printed battery performance report or stores data in your computer. Airworthiness authorities require that aircraft batteries be maintained properly and they require documentation of the batteries performance. The DATAFX has been specifically designed to monitor lead acid and nickel cadmium main ship aircraft batteries. The DATAFX will work with any charger/analyzer including the well known Christie® RF80 series. Self calibration decreases the cost of yearly multimeter calibration.

Nickel Cadmium Batteries

Nickel cadmium batteries consist of a number of individual cells connected in series. The DATAFX is capable of monitoring up to 22 individual cells as well as the overall battery voltage. For the nickel cadmium battery to operate properly, each individual cell must perform within the manufacturers specified limits. Knowing each and every individual cells performance throughout the servicing process is essential to determining the health of the battery and making intelligent cell replacement decisions.

Lead Acid Batteries

Lead acid batteries are comprised of several series connected cells but unlike the nickel cadmium battery the cells may not be individually monitored. Nevertheless, proper documentation of the batteries capabilities is required. DATAFX will provide charge and discharge parameters as well as total battery capacity.

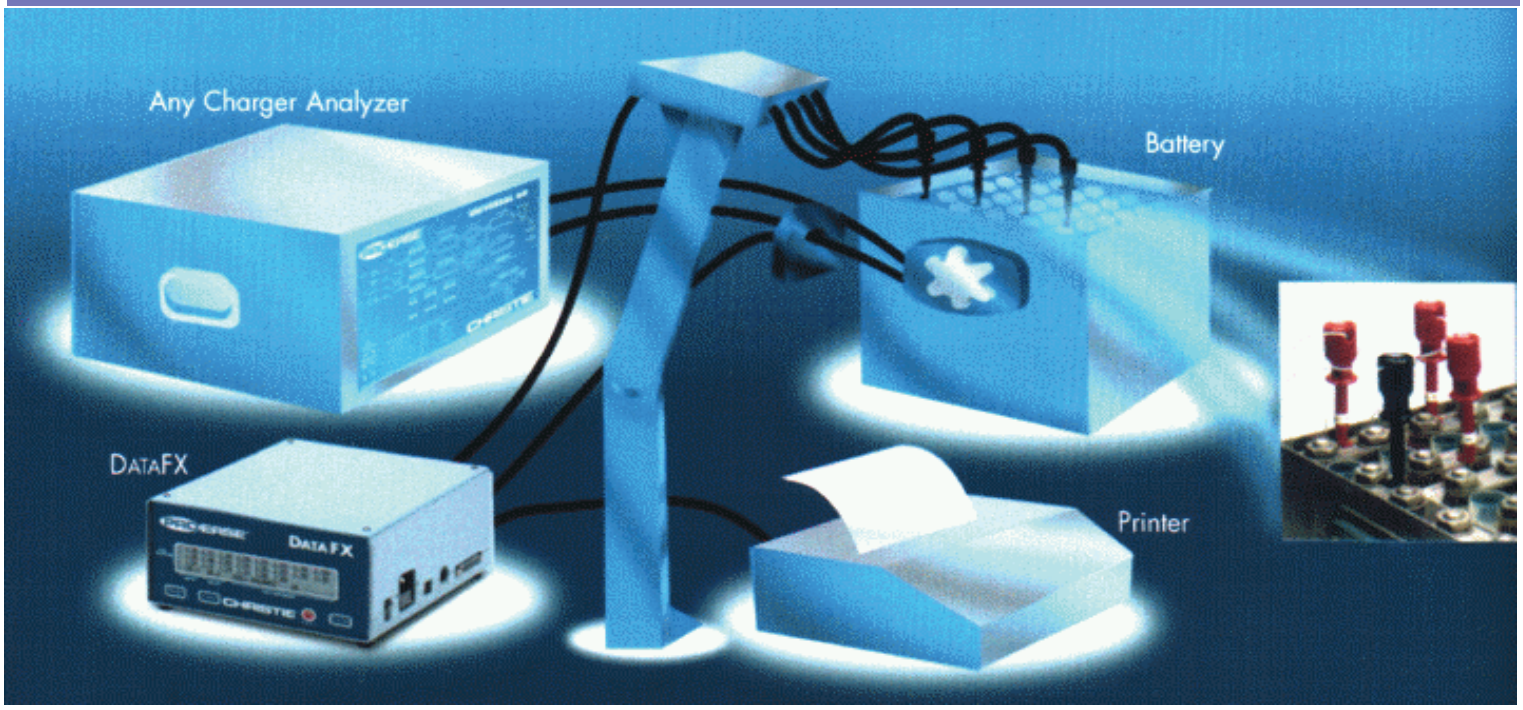
System Function

The DATAFX scans the individual cells and the battery during charge and discharge, measuring the voltages at fixed intervals. The voltage of each cell and the battery is presented on the display. If a fault condition occurs during the process a warning and an audible tone will alert personnel to the problem.

Data Documentation

The DATAFX operates from 120 volt or 230 volts mains at either 50 or 60 Hz. Voltage is manually selected and it can be used anywhere in the world. Complete with an independent current sensor it can be used with any charger/analyzer. An EPSON® compatible serial printer provides a complete hard copy report of the entire battery servicing process. The large display shows all cell voltages, battery charge or discharge current and any cell or battery faults. Anytime during the process the print button can be pushed to print out a copy of the displayed data.

Microcontroller-Based, Automatic Operation



DataFX Connected For Operation

System Set Up

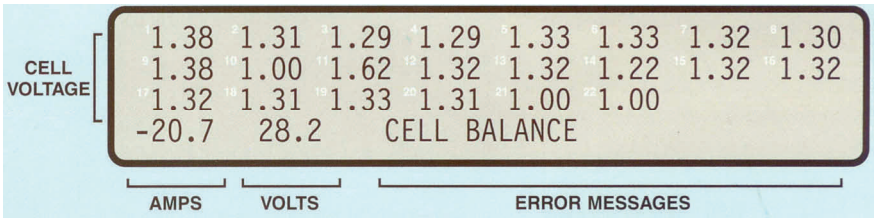
DataFX is extremely simple and straightforward to use. First, the current loop sensor is clamped to the positive lead of the charger/analyzer. Then, the negative quick-connect probe is connected to the negative terminal of the battery, and the positive quick-connect probes are connected to each cell in sequence for nickel-cadmium batteries, or to the positive terminal for lead-acid batteries.

Typical Display

In operation, DataFX automatically scans the complete series of nickel-cadmium cells. The display presents each cell voltage and the battery current and voltage. Thus the operator can, at any time, check on the process which is taking place.

If a fault occurs, the Warning Light flashes and the DataFX emits a beep. The display shows detailed fault information with the affected cells' voltages flashing until the Clear button is pressed.

Typical Display



For Cell Balance Error, Cells 10, 11, 21, 22 would be flashing on and off until the "clear" button is depressed.

Error messages may signal any of four different defects:

1. **Cell balance error** indicates that an individual cell is not in balance with the average cell voltage.
2. **Low cell volts error** indicates that a cell is in danger of reverse polarity.
3. **Negative slope error** indicates during charge that a cell has dropped below its own peak voltage by 0.1 or more volts.
4. **Reversed cell error** indicates a reverse polarity cell or improperly connected input probe.

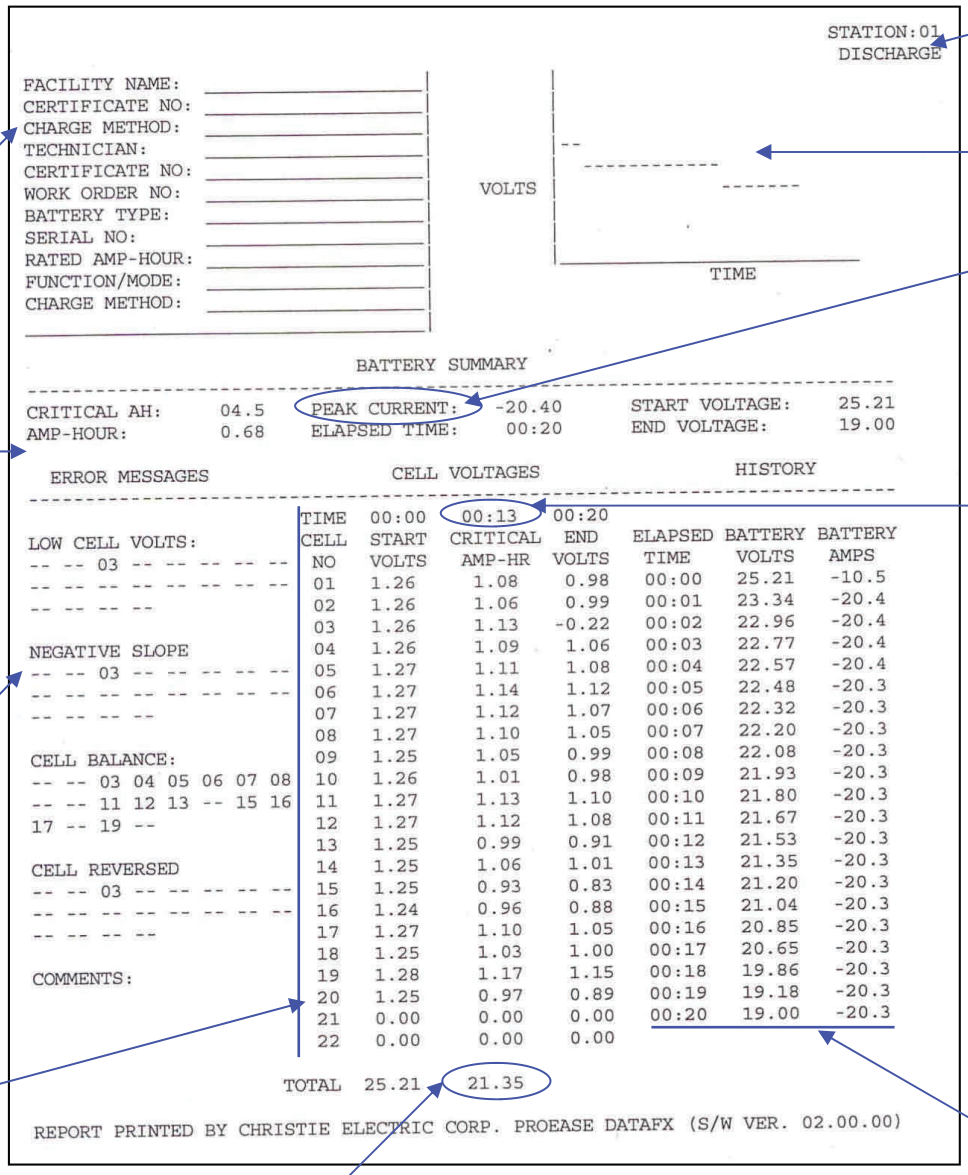
Printer Report

As an option, DataFX delivers key data acquired during the service task to an EPSON compatible serial printer through an RS232 port. This report is automatically printed at the end of the task. Also during the task, a copy of the display data can be printed out by using the Print button.

DataFX

PROEASE™

Typical DataFX Printer Report



STATION:01
DISCHARGE

FACILITY NAME:
CERTIFICATE NO:
CHARGE METHOD:
TECHNICIAN:
CERTIFICATE NO:
WORK ORDER NO:
BATTERY TYPE:
SERIAL NO:
RATED AMP-HOUR:
FUNCTION/MODE:
CHARGE METHOD:

VOLTS
TIME

BATTERY SUMMARY

CRITICAL AH:	04.5	PEAK CURRENT:	-20.40	START VOLTAGE:	25.21
AMP-HOUR:	0.68	ELAPSED TIME:	00:20	END VOLTAGE:	19.00

ERROR MESSAGES

LOW CELL VOLTS:
-- -- 03 -- -- -- -- --
-- -- -- -- -- -- -- --
-- -- -- --

NEGATIVE SLOPE
-- -- 03 -- -- -- -- --
-- -- -- -- -- -- -- --
-- -- -- --

CELL BALANCE:
-- -- 03 04 05 06 07 08
-- -- 11 12 13 -- 15 16
17 -- 19 --

CELL REVERSED
-- -- 03 -- -- -- -- --
-- -- -- -- -- -- -- --
-- -- -- --

COMMENTS:

CELL VOLTAGES

HISTORY

TIME	00:00	00:13	00:20			
CELL NO	START VOLTS	CRITICAL AMP-HR	END VOLTS	ELAPSED TIME	BATTERY VOLTS	BATTERY AMPS
01	1.26	1.08	0.98	00:00	25.21	-10.5
02	1.26	1.06	0.99	00:01	23.34	-20.4
03	1.26	1.13	-0.22	00:02	22.96	-20.4
04	1.26	1.09	1.06	00:03	22.77	-20.4
05	1.27	1.11	1.08	00:04	22.57	-20.4
06	1.27	1.14	1.12	00:05	22.48	-20.3
07	1.27	1.12	1.07	00:06	22.32	-20.3
08	1.27	1.10	1.05	00:07	22.20	-20.3
09	1.25	1.05	0.99	00:08	22.08	-20.3
10	1.26	1.01	0.98	00:09	21.93	-20.3
11	1.27	1.13	1.10	00:10	21.80	-20.3
12	1.27	1.12	1.08	00:11	21.67	-20.3
13	1.25	0.99	0.91	00:12	21.53	-20.3
14	1.25	1.06	1.01	00:13	21.35	-20.3
15	1.25	0.93	0.83	00:14	21.20	-20.3
16	1.24	0.96	0.88	00:15	21.04	-20.3
17	1.27	1.10	1.05	00:16	20.85	-20.3
18	1.25	1.03	1.00	00:17	20.65	-20.3
19	1.28	1.17	1.15	00:18	19.86	-20.3
20	1.25	0.97	0.89	00:19	19.18	-20.3
21	0.00	0.00	0.00	00:20	19.00	-20.3
22	0.00	0.00	0.00			
TOTAL	25.21	21.35				

REPORT PRINTED BY CHRISTIE ELECTRIC CORP. PROEASE DATAFX (S/W VER. 02.00.00)

Printed report documents either charge or discharge

Graphic summary of battery voltage over time

Convenient area to note facility and battery particulars

Actual peak charge or discharge current

Critical ampere-hours based on weakest cell having reached 1.0 volt in 22 minutes

Time at which the weakest cell reached end-of-capacity

All errors are recorded for review and corrective action

Prints out initial, end-of-capacity, and termination of discharge for up to 22 cells

Battery history recorded at regular intervals and automatically scaled to total processing time

Total battery voltage when the weakest cell reached end-of-capacity

DataFX SPECIFICATIONS

Electrical

Input Power: 90-135 or 200-265
Voltage: manually selected
Current: 0.03 amp, typical
Frequency: 50/60Hz

Data Output

Display: 4x40-character
Serial Printer: Dedicated RS232 port
Computer: Dedicated RS232 port

Electromechanical

Cell Probes: Spring loaded, quick connect
Current Sensor: Clip-on, Hall-effect inductive

Mechanical

Height: 4.3 inches (10.8 cm)
Width: 8 inches (20.3 cm)
Depth: 9 inches (22.9 cm)
Weight: 7 pounds (3.2 kg), inclusive of harness

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