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**NEW!**  
Now with ARINC-429

# DataTap-10 Miniature ASCB-D TIS, SIU, NIC/PROC



*Innovative High Tech Solutions and Support for Leading Edge Companies*



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# THE ASCB-D SOURCE



Laptop ASCB-D



PMC ASCB-D



Airborn Acquisition  
uTIS



Flight Test Recorder



Portable TIUs



Airborne Avionics ASCB-D



Bus Isolator



Data Tap  
Interface



DTFL-1500 Bus Reader



DTFL-1400 Bus  
Reader



Legacy PCI-NICs Honeywell 7026131-901



Legacy cPCI-NIC



Simulator  
Interface Unit  
SIU



ICS has been producing ASCB-D equipment since 1998. That equipment has been used in applications starting with Honeywell Engineering Design of ASCB-D through Flight Simulation, Flight Test, Production, and Maintenance. We also sell products worldwide directly to owners / operators of aircraft. See: [www.ASCBD.com](http://www.ASCBD.com) for a sample of our products.

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ICS has built custom solutions to several different types of ASCB needs for over 15 years. Some of these Include:

- **First Generation PCI-NIC** This was a full length PCI card design by ICS for Honeywell to fit into a PCI slot of an industrial PC platform and to act as a low cost alternative to a MAU NIC module. The PCI-NIC was designed to be nearly identical to a Honeywell MAU-NIC and runs Honeywell DEOS and NIC Flight Software.
- **Test Interface Unit (TIUs)** originally for Honeywell Engineering to test hardware and software development. The TU software was written by Honeywell to run on an ICS supplied Platform with one or two of the Legacy PCI NICs. These were first in service in 1998 and ICS has produced over 600 of these platforms for Honeywell and their customers since that time. Still produced and sold today
- **Simulator Interface Unit (SIU's)** for Interfacing flight simulators to an ASCB-D bus. First placed into service in 2000 at Fairchild / Dornier in Germany. Still produced and sold today.
- **Telemetry Interface System (TIS)** Originally developed for the Hawker Horizon and the Dornier 728 (simultaneous development) in 1999 to serve as an ASCB read only interface to existing Flight Test Acquisition Systems that did not have ASCB-D capability.
- **DataTap Bus Reader** These were originally designed and built by ICS in 2005 for field service use on a laptop and the name was later changed to **FlightLine 1400** and **FlightLine1500** platforms. The 1500 is still in production today.
- **Bus Isolation Unit (BIU)** These were first built in 2007 to allow data collection on a Gulfstream 550 German Atmospheric Research Plane called HALO during flight. The device is an ASCB-D firewall. It is simple in construction and has no software or Hardware that is subject to DO-254. The original Unit is a single channel . Newer smaller dual channel units have been built since.

Most of these original solutions were large and heavy Rack Mounted solutions based on one or two First Generation PCI-NICs.

- **First Generation PCI-NIC** Large, power hungry, and expensive to build. 1998 technology, some of it mature even in 1998.



- **Test Interface Unit (TIUs)** Typically 6U Rack Mounted enclosures that were over 60 lbs in weight. Two PCI-NICs were required for transmitting on more than one side of the aircraft. These were produced in lighter 4U rack mount systems and eventually in the light weight portable 40 Lb lunchbox ! They still used first generation PCI-NICs.



- **Simulator Interface Unit (SIU's)** These units were all built in 4U rack mounted enclosures weighing over 35 lbs. They required two first generation PCI-NICs to simulate the pilots and co-pilots ASCB bus.



- **Telemetry Interface System (TIS)** These were built in 4U and 2U chassis but were still heavy and required a lot of power.



Starting in 2004 ICS developed a software emulation of the PCI-NIC for read only applications. This resulted in some new smaller and lighter platforms, but these were dedicated purpose and required a lot of processing power rendering the platforms purpose specific.

- **DATATAP Bus Reader Table** Much smaller ASCB bus reading and recording technology technology for non real-time applications
- **FlightLine 1500** Panasonic Toughbook Based ASCB-D bus reader and recorder. Approximately 5 lbs in weight and battery powered. Another major improvement. These are still in maintenance service today but required the purchase of a dedicated laptop platform as the CPU requirements of data processing on the ASCB-D bus were still demanding.
- **Mini-TIS** Rugged PC-104 TIS replacement solution that were approximately 12 lbs in weight and drew about 20 watts. A major improvement. These are still in flight test service today



## Enough history, Meet State of the Art ASCB !



DataTap-10 Universal Interface



ASCB-D Airborne NIC and PROC in 6x10cm PWB weighing 70 Grams and using 2W.

Yes it's flying!



µTIS Flight Test Recorder and Converter  
 2 lbs, 10 watts, 128 GB (18 Hours) two full bus Recorder.



PMC Dual PCI-NIC replacement  
 With built in PDD execution



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## So how is this possible?

It may sound too good to be true,  
but it's not. The DataTap-10 really is  
Next Generation



- In 2006, ICS started a development project that would reduce the size and power consumption of the ASCB-D communications Interfaces in a dramatic way while preserving and enhancing the performance.
- The project was to take previously written ICS NIC-PDD and PROC-PDD software and implement it entirely in hardware finite state machines in an FPGA. This created an ASCB-D interface with unmatched timing precision.
- This project was extremely successful and is in use in all ICS ASCB-D products developed since that time allowing for small, low power solutions to ASCB-D interfacing needs.

# One DataTap-10, Many Applications and Multiple Functionality Replacement



*Innovative High Tech Solutions and Support for Leading Edge Companies*



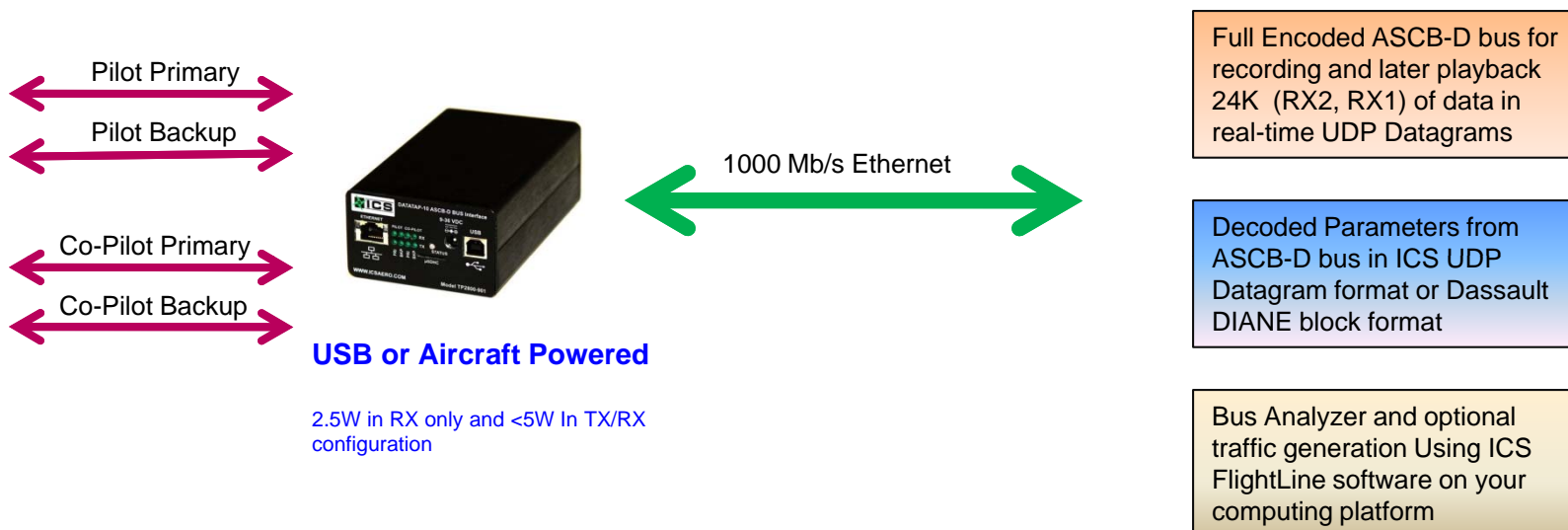
## One DataTap-10, Many Applications and Multiple Functionality Replacement



DUAL PCI-NIC replacement

- Replace two 1<sup>st</sup> Generation PCI-NICs with one DataTap-10 when purchased in optional RX and TX configuration.
- Cost is \$4900 in RX/TX configuration a savings of \$2400 over two PCI-NICs.
- Interface ASCB-D busses to DataTap-10 using same connectors and pin-out as the PCI-NIC
- Connect to TIU/SIU/TIS using 1000/100 Mb/s Ethernet
- Load NIC registry and other files via FTP over the same 1000/100 Mb/s link used for data. No more 10Base2!
- All ICS platforms that previously used PCI-NICs are now available with DataTap-10 as a replacement

## One DataTap-10, Many Applications and Multiple Functionality Replacement



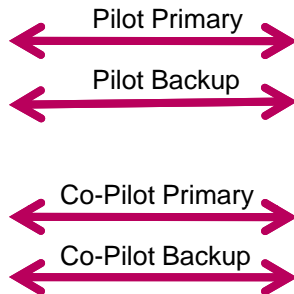
- Directly decode and convert up to 1000 parameters to Engineering Units from one DataTap-10.
- DataTap-10 is scalable, Use 2, 3, or more for larger numbers of parameters.
- Use ICS Windows Based FlightLine software (included) to use a DataTap-10 on your platform (Laptop, or Desktop) Entire contents of two ASCB-D busses can be recorded on your platform with a single FlightLine-10 adapter. The recording format can be played back by the Honeywell TIU software playback function.



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## DataTap-10, with FlightLine Software Bus Analysis, Recording, and optional Traffic Generation.



1000 Mb/s Ethernet



FlightLine DT10 (Version 10.0) from Innovative Control Systems, Inc. (ICS) Copyright 2011

Mode: Live

Chan	Parameter Name	Data Type	Value	Status	Group Stat
1	MAU1 A: 9:1, colPressureMb/ones	Float	0.000000	11	SC [1]
2	MAU1 A: 9:1, totalPressureMb	Float	0.000000	11	SC [1]
3	MAU1 A: 9:1, staticPressure	Float	-253.656250	11	SC [1]
4	MAU1 A: 9:1, impactPressureMb	Float	766.300781	11	SC [1]
5	MAU1 A: 9:1, totalAirTemperature	Float	126.222656	11	SC [1]
6	MAU1 A: 9:1, totalAirspeed	Float	0.465312	11	SC [1]
7	MAU1 A: 9:1, pressureAltitude	Float	57.749329	11	SC [1]
8	MAU1 A: 9:1, maxOperatingAirspeed	Float	256.394531	11	SC [1]
9	MAU1 A: 9:1, mach	Float	0.001787	11	SC [1]
10	MAU1 A: 9:1, attitudeRate	Float	-162.34000000	11	SC [1]
11	MAU1 A: 9:1, colTemp	Float	-163.000000	11	SC [1]
12	MAU1 A: 9:1, colPressure	Float	4096.750000	00	SC [1]
13	MAU1 A: 9:1, fuelTemp	Float	-116.000000	00	SC [1]
14	MAU1 A: 9:1, fuelFlow	Float	0.000000	00	SC [1]
15	MAU1 A: 9:1, groundSpeed	Float	-3071.500000	11	SC [1]
16	MAU1 A: 9:1, magPitchHeading	Float	-44.978027	00	SC [1]
17	MAU1 A: 9:1, flightPathAccel	Float	2.001694	11	SC [1]
18	MAU1 A: 9:1, flightPathAngle	Float	0.075882	11	SC [1]
19	MAU1 A: 9:1, verticalAngle	Float	0.001480	11	SC [1]
20	MAU1 A: 9:1, trackAngleRate	Float	-32.000000	11	SC [1]
21	MAU1 A: 9:1, trackAngleMagnetic	Float	0.079521	11	SC [1]
22	MAU1 A: 9:1, rollAngle	Float	90.072998	11	SC [1]
23	MAU1 A: 9:1, pitchAngle	Float	-179.962234	11	SC [1]
24	MAU1 A: 9:1, bodyYawRate	Float	0.053711	11	SC [1]
25	MAU1 A: 9:1, bodyRollRate	Float	-63.952637	11	SC [1]
26	MAU1 A: 9:1, bodyNomAccel	Float	1.000488	11	SC [1]
27	MAU1 A: 9:1, bodyLofAccel	Float	-1.986306	11	SC [1]
28	MAU1 B: 12:1, latitude	Float	-180.000000	11	SC [1]
29	MAU1 B: 12:1, longitude	Float	-180.000000	11	SC [1]
30	MAU1 B: 13:1, calibratedAirspeed	Float	30.000000	01	SC [1]
31	MAU1 B: 13:1, baroAltitude	Float	-2000.000000	01	SC [1]
32	MAU1 B: 13:1, mach	Float	0.000000	01	SC [1]
33	MAU1 B: 13:1, radDriftData	Float	-40.000000	01	SC [1]
34	MAU1 B: 13:1, verticalSpeed	Float	-10000.000000	01	SC [1]
35	MAU1 B: 13:1, rollAngle	Float	-180.000000	01	SC [1]
36	MAU1 B: 13:1, pitchAngle	Float	-90.000000	01	SC [1]
37	MAU1 B: 31:1, windAngle	Float	98.481445	01	SC [1]
38	MAU1 B: 31:1, windSpeed	Float	181.281250	10	SC [1]
39	MAU1 B: 31:1, timeToGo	Float	652.089438	10	SC [1]
40	MAU1 B: 31:1, timeToDest	Float	198.054688	00	SC [1]
41	MAU1 B: 31:1, magVer	Float	118.496535	11	SC [1]
42	MAU1 B: 31:1, machTarget	Float	0.060078	01	SC [1]
43	MAU1 B: 31:1, slkAngle	Float	16.469871	11	SC [1]
44	MAU1 B: 31:1, glideSlope	Float	1.010000	01	SC [1]
45	MAU1 B: 31:1, groundSpeed	Float	461.750000	10	SC [1]
46	MAU1 A: 9:1, tmvPosition	Float	-128.000000	11	SC [1]
47	MAU1 A: 9:1, n2Speed	Float	0.000000	11	SC [1]
48	MAU1 A: 9:1, n1Speed	Float	0.000000	11	SC [1]
49	MAU1 A: 9:1, eprCmd	Float	0.000000	11	SC [1]
50	MAU1 A: 9:1, eprActual	Float	0.000000	11	SC [1]



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## DataTap-10, with FlightLine Software Bus Analysis, Recording, and optional Traffic Generation.

**DataTap-10 Status and Control**

PILOT (P1)      CO-PILOT (P2)

PACKETS: 00000000      00000000

CRC ERRORS: 00000000      00000000

RUNT ERRORS: 00000000      00000000

RX SWITCH: PRIMARY      PRIMARY

STATUS COUNTER: 00000039      FRAME COUNT: A0DCC42B      % LOAD: 00

FPGA CONFIG VER: 05101101      Ethernet Status: 1000 Mb/s

CPU 0 SW VERSION: Apr 9 2011 13:30:15

CPU 1 SW VERSION: Apr 9 2011 13:52:03

ESCAPE REGISTRY FILE INFO

Planeview GVI: GVI Planeview T10 PRODUCE ALL: 34331069-NIC Reg-0013E6C4

NIC REGISTRY FILE INFO

Planeview GVI: GVI Planeview T10 PRODUCE ALL: 34331069-NIC Reg-0013E6C4



**FlightLine ASCB-D Configuration**

Options

Database: Planeview\_GVI\_Configuration\_Data\_ITF\_631\_4\_2.mdb [Change]

Configuration: GVI Planeview

Mapping File: ACRA\_DEMO\_ICCS.map [Change]

Data Source:  ASCB-D Bus [Live]     Playback [Recorded]

Recording File: TIS\_FORMAT\_TEST [Change]

Playback File: [Change]

NIC Registry: GVI\_PRODUCES\_ALL\_NIC\_le\_reg [Change]

Escape Registry: EscapedS.reg [Change]

Font Size:  Small     Medium     Large

DATATAP 10 UDP IP and port: 127.1.1.0 4096 [OK]

**FlightLine DT10 (Version 10.0) from Innovative Control Systems, Inc. (ICS) Copyright 2011**

Mode: Live      Data Tap: 00000204

CHAN	Parameter Name	Data Type	Value	Status	Connect Status
0	MAU1 A: 9:1, totalPressureMbStatus	Variant/Status	0x00000000		SC [1]
1	MAU1 A: 9:1, totalPressureMb	Float	0.203125	11	SC [1]
2	MAU1 A: 9:1, staticPressure	Float	0.000000	11	SC [1]
3	MAU1 A: 9:1, impactPressureMb	Float	-253.656250	11	SC [1]
4	MAU1 A: 9:1, calibratedAirspeed	Float	768.300781	11	SC [1]
5	MAU1 A: 9:1, totalAirTemperature	Float	128.222656	11	SC [1]
6	MAU1 A: 9:1, trueAirspeed	Float	0.445312	11	SC [1]
7	MAU1 A: 9:1, pressureAltitude	Float	57.749329	11	SC [1]
8	MAU1 A: 9:1, maxOperatingAirspeed	Float	256.394531	11	SC [1]
9	MAU1 A: 9:1, mach	Float	0.001787	11	SC [1]
10	MAU1 A: 9:1, altitudeRate	Float	-16234.000000	11	SC [1]
11	MAU1 A: 9:1, oilTemp	Float	-1502.000000	11	SC [1]
12	MAU1 A: 9:1, oilPressure	Float	4095.750000	00	SC [1]
13	MAU1 A: 9:1, fuelTemp	Float	-116.000000	00	SC [1]
14	MAU1 A: 9:1, fuelFlow	Float	0.000000	00	SC [1]
15	MAU1 A: 9:1, groundSpeed	Float	-3071.500000	11	SC [1]
16	MAU1 A: 9:1, magneticHeading	Float	-44.978027	00	SC [1]
17	MAU1 A: 9:1, flightPathAccel	Float	2.001694	11	SC [1]
18	MAU1 A: 9:1, flightPathAngle	Float	0.075682	11	SC [1]
19	MAU1 A: 9:1, verticalAccel	Float	0.001480	11	SC [1]
20	MAU1 A: 9:1, trackAngleRate	Float	-32.000000	11	SC [1]
21	MAU1 A: 9:1, trackAngleMagnetic	Float	0.079531	11	SC [1]
22	MAU1 A: 9:1, rollAngle	Float	90.025998	11	SC [1]
23	MAU1 A: 9:1, pitchAngle	Float	-179.962234	11	SC [1]
24	MAU1 A: 9:1, bodyYawRate	Float	0.053711	11	SC [1]
25	MAU1 A: 9:1, bodyRollRate	Float	-63.952837	11	SC [1]
26	MAU1 A: 9:1, bodyNormAccel	Float	1.000488	11	SC [1]
27	MAU1 A: 9:1, bodyLapAccel	Float	-1.989206	11	SC [1]
28	MAU1 B: 12:1, latitude	Float	-180.000000	11	SC [1]
29	MAU1 B: 12:1, longitude	Float	-180.000000	11	SC [1]
30	MAU1 D: 13:1, costrometerspeed	Float	30.000000	00	SC [1]
31	MAU1 B: 13:1, baroAltitude	Float	-2000.000000	00	SC [1]
32	MAU1 B: 13:1, mach	Float	0.000000	00	SC [1]
33	MAU1 B: 13:1, radioData	Float	-40.000000	00	SC [1]
34	MAU1 B: 13:1, verticalSpeed	Float	-10000.000000	00	SC [1]
35	MAU1 B: 13:1, rollAngle	Float	-180.000000	00	SC [1]
36	MAU1 B: 13:1, pitchAngle	Float	-90.000000	00	SC [1]
37	MAU1 B: 31:1, windAngle	Float	98.481445	00	SC [1]
38	MAU1 B: 31:1, windSpeed	Float	101.281750	10	SC [1]
39	MAU1 B: 31:1, timeToDest	Float	652.085930	10	SC [1]
40	MAU1 B: 31:1, timeToDest	Float	198.054688	00	SC [1]
41	MAU1 B: 31:1, magVar	Float	118.498535	11	SC [1]
42	MAU1 B: 31:1, machTarget	Float	0.060078	00	SC [1]
43	MAU1 B: 31:1, dirnAngle	Float	10.469971	11	SC [1]
44	MAU1 B: 31:1, glideSlope	Float	1.010000	00	SC [1]
45	MAU1 B: 31:1, groundSpeed	Float	461.750000	10	SC [1]
46	MAU1 A: 9:1, truePosition	Float	-128.000000	11	SC [1]
47	MAU1 A: 9:1, n2Speed	Float	0.000000	11	SC [1]
48	MAU1 A: 9:1, n1Speed	Float	0.000000	11	SC [1]
49	MAU1 A: 9:1, engineCmd	Float	0.000000	11	SC [1]
50	MAU1 A: 9:1, engineActual	Float	0.000000	11	SC [1]

Record, Playback, CSV Generation, DataTap-10 Configuration, ESCAPE Database parameter selection, TIS/SIU Configuration file generation, Excel Parameter List management



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## FlightLine Software Overview

- Directly Load Honeywell® ESCAPE Database files in old MS Access 97 format as well as newer MS Access formats.
- Place all parameters in Tree View for selection on Data Display
- Provides control and file loading for DataTap-10 adapters when the adapter is present but does not require an adapter to playback data or to create maps.
- FlightLine software is now also used to produce TIS.CFG files for other ICS products such as TIS, Mini-TIS and  $\mu$ TIS, and SIU replacing the older TIS configuration software.
- Can be used for post data analysis and playback without DataTap-10
- Plays back ICS TIS and SIU format recordings to screen and optionally a CSV file.
- Provides Shared Memory Object interface of decoded data to other applications running on the same platform such as Microsoft Flight Simulator or X-plane.
- Contains new Load XLS Map command that allows automated creation of parameter sets from Microsoft access that can be loaded directly from Excel spreadsheets instead of having to select each parameter individually from the tree view list.

## DataTap-10 Optional I/O

When Equipped with the Optional DB-50 I/O connector and onboard hardware the DataTap-10 can be used for more than just ASCB traffic analysis and generation. The following interfaces below are supported (simultaneously with ASCB)

This functionality is an option to the Base DataTap-10 and is broken into Analog/Discrete/RS-232 and ARINC-429 options. The ARINC-429 option includes the Analog/Discrete/RS-232 I/O but the Datatap-10 is available without the ARINC-429 due to the cost of the Interface ICs

- Four 3.3v – 60V input discrettes
- Four 9-60V output discrettes that can source or sink up to 2 amps each.
- Three +/- 10V Analog Inputs 16-24 bits with internal precision reference.
- IRIG B Timing Input (can be used as forth Analog input)
- Two RS-232 ports
- Four High/low speed ARINC-429 inputs
- Two High / Low speed ARINC-429 Outputs
- 9-36VDC power can also be supplied to the DT10 through the DB-50





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## DataTap-10 ARINC-429 Optional I/O

When Equipped with the Optional DB-50 I/O connector and onboard hardware the DataTap-10 can be used for ARINC-429 I/O as well as ASCB traffic analysis and generation. This functionality is supported (simultaneously with ASCB) traffic analysis and generation.

- Four High/low speed ARINC-429 inputs per DataTap-10
- Two High / Low speed ARINC-429 Outputs per DataTap-10
- FlightLine Software supports multiple DataTap-10s connected for increased ARINC-429 channel counts.
- Decoding in Engineering Units by Selectable Equipment ID expected to be implemented by end of September 2011.
- Parameters added to same display as ASCB-D data.
- All Data on display screen (ARINC-429 and ASCB-D) can be exported to Comma Separated Values (CSV) file.

The ARINC-429 SETUP window is titled "ARINC-429 SETUP" and features a large red vertical bar on the left with the text "A 4 2 9". The window is divided into sections for RX and TX channels. On the right side, there is a "DataTap-10 ID" field with the value "1".

**RX Channels:**

- RX Channel 0:** Active (checked), Bus Speed: HIGH, Parity: ODD, Poll Rate MS: 10
- RX Channel 1:** Active (checked), Bus Speed: HIGH, Parity: ODD, Poll Rate MS: 10
- RX Channel 2:** Active (checked), Bus Speed: HIGH, Parity: ODD, Poll Rate MS: 10
- RX Channel 3:** Active (checked), Bus Speed: HIGH, Parity: ODD, Poll Rate MS: 10

**TX Channels:**

- TX Channel 0:** Active (checked), Bus Speed: HIGH, Parity: ODD, Master Rate MS: 100, Word Gap (bits): 32
- TX Channel 1:** Active (checked), Bus Speed: HIGH, Parity: ODD, Master Rate MS: 100, Word Gap (bits): 32

Buttons: APPLY, EXIT

The ADD ARINC-429 PARAMETER window is titled "ADD ARINC-429 PARAMETER". It contains the following fields and options:

- DataTap-10 ID:** 1
- ARINC LABEL:** 377 (Octal)
- Adapter Channel:** RX Channel 0 (selected), RX Channel 1, RX Channel 2, RX Channel 3, TX Channel 0, TX Channel 1
- Parity:** ODD (selected), EVEN
- Display Units:** HEX, DECIMAL, BINARY (selected), OCTAL, ENG
- RATE (mS):** 100.0
- Equipment ID List:** A list of equipment IDs including 001 Flight Control Computer, 002 Flight Management Computer, 003 Thrust Control Computer, 004 Inertial Reference System, 005 Attitude and Heading Ref Sys, 006 Air Data System, 007 Radio Altimeter (highlighted), 008 Airborne Weather Radar, 009 Airborne DME, 00A FAC (A310), 00B Global Positioning System, 00D AIDS Data Management Unit, 010 Airborne ILS Receiver, 011 Airborne VOR Receiver, 012 Airborne ADF System, 016 Airborne VHF Comm. Receiver

Buttons: OK



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## DataTap-10 ARINC-717 FDR Optional I/O

Coming Soon 4<sup>th</sup> QTR 2011





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# DataTap-10

The lowest cost, most capable ASCB-D interface yet.

First production units became available June 12<sup>th</sup>, 2011



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# Contact Information

To request quotations, general information, or to place orders, please contact us at:



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