nDAU-2008/10/12/16

Network Data Acquisition and Encoding Unit

CURTISSWRIGHTDS.COM

Key Features

- Network-based data acquisition and encoding unit
- Includes Fast ethernet 100BASE-T port for
  - + Acquisition setup and configuration
  - + SNMP status and control
  - + Acquisition data transport
  - + Time synchronization using IEEE 1588 time
- nDAU-2016 accepts up to 16 high-performance signal conditioning modules
- User-programmable format and sample sequence and programmable simultaneous sample

Applications

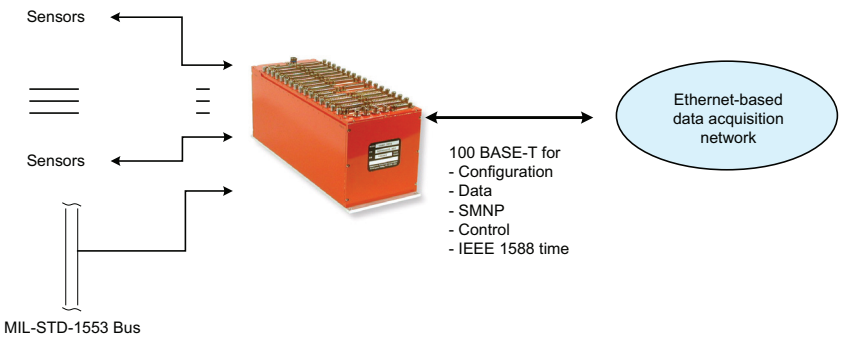
- Flight test instrumentation
- Air vehicle test, certification, or development
- Ethernet-based network distributed systems
- System safety monitoring

Overview

The nDAU-20XX is a network-based data acquisition and encoding unit. It is designed to interface with a variety of analog and digital sensors and avionic data sources. The system is reconfigurable to handle additional channel inputs or to accommodate other types of data via plug-in modules. The unit delivers packetized data to the Ethernet-based network for recording, display, telemetry and processing purposes. The unit is fully programmable over the network and supports SNMP for status and control. The nDAU-20XX is fully compatible with IEEE 1588 to synchronize to the network clock for data time-tagging.

Additional features

- Plug-in modularity and expandability:
  - + Signal conditioning
  - + 1553 monitor/RT/bus controller
  - + Avionics interfaces
- Supports IEEE 1588 for acquisition of coherent global timing information over the network fabric
- Unit includes 64 Mbytes of Flash, 32 Mbytes of RAM, a PowerPC® processor that allows future implementation of web pages, and engineering unit conversion on selected acquisition data channels
- Acquisition bandwidth of up to 1.25 MSPS
- Fully programmable operation



nDAU-2008/10/12/16 Functional block diagram

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Specifications

General

- Data output: Full speed 100BASE-T Ethernet-based UDP packets of acquired data. This includes system audit, setup and configuration, SNMP unit status and diagnostics.
- Data rate: Programmable up to 1.25 MSPS at 16 BPW resolution
- System setup: Stand-alone unit programmed via the network
- Calibration: System-wide calibration is available via SNMP through the network. Specific calibration features depend on the types of signal conditioning modules being used.

Encoding

- Analog encoding: Analog inputs are encoded using 12-bit or 16-bit resolution based on the type of conditioning card. Data is encoded using natural binary representation.
- Channel gain/offset: Signal conditioning cards are fully programmable. Some cards have a common second-stage amplifier that provides additional gains on a per-channel basis. Channel offset is user-programmable in 4,096 steps. All gain/offset control is provided through TTCware™ software.
- Digital encoding: Digital inputs are formatted and packetized for transmission over the network
- System accuracy: Overall end-to-end accuracy better than 0.5% over the operating temperature range. Refer to signal conditioning card data sheets for additional details.
- Word format: Programmable for either 8-16 bits per word. The analog data MSB is the first bit transmitted.
- Sample sequence: Compatible with any format defined by the user

Electrical

- Power input: +28 ±4VDC
- Power consumption: 40-80W typical. Exact power consumption depends on the specific module configuration.
- Grounding: Isolated power, signal and chassis grounds

Environmental

- Operating temperature: -40 to 85ºC (box ambient temperature)
- Storage temperature: -55 to 100ºC
- Random vibration: 15 grms, 20 to 2,000 Hz, 10 minutes, any axis
- Acceleration: 25g, indefinite duration, any axis
- Shock: 15g, half-sine, 11 mS, 6 shocks, any axis
- Humidity: 5 to 95% RH, non-condensing
- Altitude: 0 to 70,000 ft
- EMI/EMC: Per MIL-STD-461/462

Dimensions and Mechanical

- Dimensions (W x H x L):
  - nDAU-2008 (8 slots):
    - 4.97 x 5.40 x 8.62” (126 x 137 x 219 mm)
    - Weight: 7.0 lb (3.18 Kg) estimated
  - nDAU-2010 (10 slots):
    - 4.97 x 5.54 x 9.96” (126 x 137 x 253 mm)
    - 10 lb (4.54 kg) estimated
  - nDAU-2012 (12 slots):
    - 4.97 x 5.54 x 11.30” (126 x 137 x 287 mm)
    - 10.5 lb (4.77 kg) estimated
  - nDAU-2016 (16 slots):
    - 4.97 x 5.54 x 13.98” (126 mm x 137 x 355 mm)
    - 12 lb (5.45 kg) estimated
- Connectors: Input power uses circular military connector. Data I/O and control inputs use commercial “D” and “DD” style connectors.

System Overhead Module

- PPC-520E-2: Acquisition overhead card with 100BASE-T Ethernet port and IEEE 1588 network time support, PowerPC® processor with 32 MB of RAM, 64 MB of Flash, and hosts the unit’s operating system.

Ordering Information

Please contact Curtiss-Wright Defense Solutions.

Multiplexer/Converter Cards

Cards for analog, audio, current, potentiometer, and voltage sensors, acceleration, air velocity, flow/force, pressure, shock (amplified output) sensors.

TABLE 1

CARD NAME	NUMBER OF CHANNELS	FILTERING TYPE
AMD-116A Analog multiplexer, differential	16	Fixed 4 KH with averaging
AMD-116P Analog multiplexer, differential	16	Fixed 4 KH
RMS-116 RMS to DC converter	16	

Temperature Cards

Cards for RTD, temperature, and thermocouple sensors

TABLE 2

CARD NAME	NUMBER OF CHANNELS	DESCRIPTION
RTD-110A RTD-110W** Conditioner module with constant current excitation	10	4-wire output, gain=1 to 80
RTD-122A** Conditioner module with constant current excitation	20	Digital output, gain=1 to 80
TCD-116** Thermocouple multiplexer with reference junction compensation	16	RJC-108 supports J, K, E and T-type thermocouples
TCD-216** Thermocouple multiplexer with reference junction compensation	16	RJC-108 supports J, K, E and T-type thermocouples, 250/1000 Hz update rate, 16/12-bit resolution

Gain Ranging Conditioner Cards

Cards for acceleration, bridge or piezoresistive sensors

TABLE 3

CARD NAME	NUMBER OF CHANNELS	DESCRIPTION
GRC-104A** Gain ranging conditioner with constant voltage and current excitation	4	Programmable 6-pole Butterworth filter, average output, and simultaneous sample

** Card operational at speeds up to 20 Mbps

Wireless Card

TABLE 5

CARD NAME	DESCRIPTION
BLT-100R**	Bluetooth receiver card

Synchro/Resolver Cards

TABLE 6

CARD NAME	NUMBER OF CHANNELS	DESCRIPTION
LRV-103 LVDT/RVDT conditioner module	3	2- or 3/4-wire configuration, 1 to 10 VRMS (or 10 to 30 VRMS) reference, programmable excitation
SRD-103 Synchro/resolver conditioner module	3	16 Bit @ 18 RPS

Bus/Avionics Interface Cards

TABLE 7

CARD NAME	NUMBER OF CHANNELS	DESCRIPTION
ASB-100 ASB-200**	2 1	Avionics standard communications bus monitor
BCT-553	1	1 dual-redundant MIL-STD-1553 bus controller
BIM-100	NA	Altitude to ARINC 429 converter card
BIM-232	4	RS 232/RS422 bus monitor with Rosemont and Honeywell PPT transducer capability and enhanced triggering capability
BIM-429-4	8	ARINC 429, Chapter 4 compatible bus monitor
BIM-429-8	8	ARINC 429, Chapter 4 and 8 compatible bus monitor
BIM-553-4 BIM-553A-4**	1	1 dual-redundant 1553, Chapter 4 compatible bus monitor
BIM-553-8 BIM-553A-8**	1	1 dual-redundant 1553, Chapter 4 and 8 compatible bus monitor
BRT-553	NA	MIL-STD-1553 remote terminal card
CAN-102A**	2	CAN bus interface monitor with Chapter 8 output
CDL-101 CDL-110	1	Cross-channel data link card
CMP-112	2	IRIG Chapter 8
DCM-101 DCM-101B	1	PCM merger card
SDI-102	2	Serial PCM input card
SDI-120B	2	Serial PCM input card with bit synchronizer

** Card operational at speeds up to 20 Mbps

User Defined I/O Cards

TABLE 9

CARD NAME	DESCRIPTION
USR-100**	Utility card with backplane electronics

Digital Sensor Cards

TABLE 8

CARD NAME	NUMBER OF CHANNELS	DESCRIPTION
BLS-124A**	24	Bi-level multiplexer
BLS-148	48	Bi-level multiplexer with time tagging
BLS-148H**	48	High-speed bi-level multiplexer
FPD-104-1	4	Frequency/period conditioner with 20 bit output
FPD-104-2	4	Frequency/period conditioner with 24 bit output
FPD-104B	4	Frequency/period conditioner with 20 bit output and totalizer back-up

Charge Amplifier Cards

Cards for acceleration (variable capacitance); acoustical, force, pressure, shock (piezoelectric); vibration sensors

TABLE 10

CARD NAME	NUMBER OF CHANNELS	DESCRIPTION
CAS-108D**	8	Programmable digital filter and gain

Video and Voice Cards

TABLE 11

CARD NAME	NUMBER OF CHANNELS	DESCRIPTION
CVC-101 CVC-101J**	1 video and voice input	H.261 video compression
CVC-101M CVC-401M**	1 video/1 audio input	MPEG-2 video compression
CVS-101	1	Voice conditioner card
CVS-102	2	Voice conditioner card
CVS-104	4	Voice conditioner card
VFE-100	1-channel voice conditioner/2-channel event counter card	

** Card operational at speeds up to 20 Mbps

Signal Conditioning Cards

Cards for acceleration, bridge, acoustical, (piezoresistive); analog (low level), bridge, current, force (millivolt output), load cell, potentiometer, strain gauge; torque, bridge (piezoresistive); vibration, and voltage sensors. All cards listed provide simultaneous sampling and programmable filtering.

TABLE 12

CARD NAME	NUMBER OF CHANNELS	FILTERING TYPE	CURRENT(C)/ VOLTAGE(V) EXITATION
SCD-108D**	8	digital	V
SCD-108S	8	6-pole	V
SCD-108W**	8	6-pole	V
SCD-112D**	12	digital	V
SCD-116D**	16	digital	V
SCD-208D	8	digital	C
SCD-208S	8	6-pole	C
SCD-608D**	8	digital	V, C
SCD-608S	8	6-pole	V, C
SCD-608W**	8	6-pole	V, C
PMC-106A**		5-pole	

Pressure Scanner Interface Cards

Cards for Pressure Systems Inc. ESP Series

TABLE 13

CARD NAME	NUMBER OF CHANNELS	NUMBER OF ESP SCANNERS SUPPORTED
PSS-164A	64	1
PSS-264A	128	2

GPS/Time Code Cards

TABLE 4

CARD NAME	NUMBER OF CHANNELS	DESCRIPTION
GPS-101A		GPS conditioning card
IRG-101B		IRIG time reader/generator card

** Card operational at speeds up to 20 Mbps