NuDAM Products

Overview
ADLINK's Intelligent Remote Data Acquisition & Control Modules (NuDAM) are designed for data acquisition systems based on PCs and other processor based equipment with standard serial I/O ports (RS-232 or RS-485 with autodirection control). The modules convert input/output signals to engineering units and transmit/receive, in ASCII format, to/from any host computer with an RS-232 or RS-485 port. The NuDAM modules are the key components in flexible and cost effective remote data acquisition and control systems.

Software Support

Window® DLL
The NDS-DLL6 dynamic link library for NuDAM modules offers a high performance data acquisition library for developing custom applications under Windows® 98/NT/2000/XP.

OPC Server 2.0
NDS-OPC, an OPC Data Access specification 2.0 compliant server, enables data exchange between OPC clients and NuDAM modules.

ActiveX Control
The NDS-OCX ActiveX control for NuDAM modules works with any ActiveX control container, including Visual Basic, Visual C++, Borland C++ Builder, Borland Delphi, etc.

Command Set
String commands can be used to access NuDAM modules. Commands are generally composed of several characteristics, including leading code, address ID, variables, optional check-sum bytes, and a carriage return to indicate the end of a command.

NuDAM Administration
NuDAM Administration provides a user-friendly and powerful interface to initialize, configure, and test NuDAM modules.

Dynamic Link Library (DLLs)

- Windows 2000/XP standard DLLs for ADLINK products
- Linux-based libraries for ADLINK products
- 32-bit device drivers (Windows 2000/XP and Linux)
- Complete set of Visual C/C++ and Visual Basic example programs included

ActiveX, OPC Server, and DAQBench

- HSL-OCX / MOTION-OCX / NDS-OCX: ActiveX controls for ADLINK HSL systems, NuDAM modules, and motion cards
- HSL-OPC / NDS-OPC: OPC 2.0 Server for ADLINK HSL systems and NuDAM modules
- DAQBench
  - 32-bit ActiveX control component library
  - User interface controls including meters, switches, graphs, etc.
  - Analysis library including statistics, matrices, FFT, thermocouple, etc.
  - Network-wide capability for OPC and NetDDE
  - Works with any ActiveX control containers (VB, VC++, Delphi, etc.)
## Converter Modules

<table>
<thead>
<tr>
<th>Model Name</th>
<th>ND-6510</th>
<th>ND-6520</th>
<th>ND-6530</th>
<th>ND-6531</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input</td>
<td>RS-485/422 (Independent)</td>
<td>RS-232</td>
<td>USB</td>
<td>RS-422/485</td>
</tr>
<tr>
<td>Speed</td>
<td>300~115.2K</td>
<td>300~115.2K</td>
<td>300~115.2K</td>
<td>300~115.2K</td>
</tr>
<tr>
<td>Power Input</td>
<td>10V~30V</td>
<td>10V~30V</td>
<td>10V~30V</td>
<td>10V~30V</td>
</tr>
</tbody>
</table>

## Analog Modules

<table>
<thead>
<tr>
<th>Model Name</th>
<th>ND-6013</th>
<th>ND-6017</th>
<th>ND-6018</th>
<th>ND-6021</th>
<th>ND-6024</th>
</tr>
</thead>
<tbody>
<tr>
<td>Channels</td>
<td>3</td>
<td>8</td>
<td>8</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Input Type</td>
<td>RTD</td>
<td>V, mA</td>
<td>Thermocouple, V, mA</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Output Type</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>mA, V</td>
<td>V, 7 TTL input</td>
</tr>
<tr>
<td>Sampling Rate</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Power Input</td>
<td>10V~30V</td>
<td>10V~30V</td>
<td>10V~30V</td>
<td>10V~30V</td>
<td>10V~30V</td>
</tr>
</tbody>
</table>

## Digital Modules

<table>
<thead>
<tr>
<th>Model Name</th>
<th>ND-6050</th>
<th>ND-6052</th>
<th>ND-6053</th>
<th>ND-6054</th>
<th>ND-6056</th>
<th>ND-6058</th>
<th>ND-6060</th>
<th>ND-6063</th>
<th>ND-6067</th>
<th>ND-6080</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input CH No.</td>
<td>7</td>
<td>8</td>
<td>16</td>
<td>15</td>
<td>–</td>
<td>24(1) + 4</td>
<td>4</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Output CH No.</td>
<td>8</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>15</td>
<td>24(1)</td>
<td>–</td>
<td>8(Relay)</td>
<td>8(AC Relay)</td>
<td>2</td>
</tr>
<tr>
<td>Counter No.</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Switch level</td>
<td>Input: TTL, output: open collector transistor</td>
<td>V&lt;sub&gt;Low&lt;/sub&gt;(0): +1 Vmax, High(1): +3.5V~24V</td>
<td>TTL</td>
<td>V&lt;sub&gt;Low&lt;/sub&gt;(0): +1 Vmax, High(1): +3.5V~24V</td>
<td>Common Ground</td>
<td>Low(0): +1 Vmax, High(1): +2.4V~6V</td>
<td>Low(0): +0.2 Vmax, High(1): +24V</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Power Input</td>
<td>10V~30V</td>
<td>10V~30V</td>
<td>10V~30V</td>
<td>10V~30V</td>
<td>10V~30V</td>
<td>10V~30V</td>
<td>10V~30V</td>
<td>10V~30V</td>
<td>10V~30V</td>
<td>10V~30V</td>
</tr>
</tbody>
</table>

Note (1): 24CW 8255 PWM mode 3 emulation.

## Ethernet Module

<table>
<thead>
<tr>
<th>Model Name</th>
<th>ND-8511</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module Type converter</td>
<td>RS-232/422/485 (DIP switch selected) to Ethernet</td>
</tr>
<tr>
<td>Power Input</td>
<td>10V~30V</td>
</tr>
<tr>
<td>Temperature</td>
<td>-40~85°C</td>
</tr>
</tbody>
</table>

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**Converter Modules**

**ND-6510**
RS-422/RS-485 Repeater

- **Input**
  - RS-422 (4-wire, full-duplex)
  - RS-485 (2-wire, half-duplex) protocol
- **Output**
  - RS-422 (4-wire, full-duplex)
  - RS-485 (2-wire, half-duplex) protocol
- **Speed**: 115.2k, 57.6k, 38.4k, 19.2k, 9600, 4800, 2400, 1200
- **Auto baud rate and data format adjustment**
- **Isolation Voltage**: 2500Vrms
- **Surge protector on communications signals**
- **Connector**: Plug-in screw terminal block
- **Power Consumption**: 1.04W typical

**ND-6520**
RS-232 to RS-422/485 Converter

- **Protocol**
  - RS-422 (4-wire, full-duplex)
  - RS-485 (2-wire, half-duplex) protocol
- **Speed**: 115.2k, 57.6k, 38.4k, 19.2k, 9600, 4800, 2400, 1200
- **Auto baud rate and data format adjustment**
- **Isolation Voltage**: 2500Vrms
- **Surge protector on RS-422/485 communications signals**
- **Repeater request**: Over 128 modules or distance over 4000 feet
- **Connector**: Female DB-9 and plug-in screw terminal block
- **Power Consumption**: 0.912W typical

**ND-6530**
USB to RS-422/RS-485 Converter

- **Protocol** (DIP switch selectable)
  - RS-232 (5-wire: RXD, TXD, RTS, CTS, GND)
  - RS-422 (4-wire: TX+, TX-, RX+, RX-)
  - RS-485 (2-wire: Data+, Data-)
- **Speed**: 1200-115.2k bps
- **Isolation Voltage**: 2500Vrms
- **USB 1.1 compliant**
- **Power Consumption**: 0.795W typical

**ND-6531**
Configurable Communications Controller

- **Protocol**
  - RS-232 (5-wire: RXD, TXD, RTS, CTS, GND)
  - RS-422 (4-wire: TX+, TX-, RX+, RX-)
  - RS-485 (2-wire: Data+, Data-)
- **Speed**: 1200-115200 bps (RS-232 and RS-422/485 can be set to different baud rate)
- **Convert RS-422/485 to RS-232 with configurable address**
- **Isolation Voltage**: 1000Vdc
- **Surge protector on communications signals**
- **Repeater Request**: Over 128 modules or 4,000 feet
- **Connector**: Female DB-9 and plug-in screw terminal block
- **Power Consumption**: 1.008W typical

**NDP-243, NDP-243U**
Panel Mounting Power Supply

- **Input Voltage**
  - NDP-243: 90-264VAC
  - NDP-243U: 170-264VAC
- **Input Frequency**: 47-43Hz
- **Input Current**: 1.4A (max.)
- **Output Voltage**
  - NDP-243: +12VDC ±10%
  - NDP-243U: +5VDC 1A, +12VDC 1A, +24VDC 3A
- **Output Current**: 3A (max.)
- **Overload Protection**
- **Dimensions**: 5” (L) x 3.8” (W) x 1.6” (H)
- **Operating Temperature**: 0°-50°C
## Analog Modules

**ND-6013**  
3-CH RTD Input Module  

### Analog Input  
- Channels: 3  
- Input Type: Pt-100, Ni-100, or Ni-120 RTD  

#### RTD Type  
<table>
<thead>
<tr>
<th>Type</th>
<th>Temperature Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pt-100</td>
<td>0°C to +100°C</td>
</tr>
<tr>
<td>Ni-100</td>
<td>0°C to +100°C</td>
</tr>
<tr>
<td>Ni-120</td>
<td>0°C to +100°C</td>
</tr>
<tr>
<td>Pt-120</td>
<td>-100°C to +100°C</td>
</tr>
<tr>
<td>Pt-240</td>
<td>-100°C to +200°C</td>
</tr>
<tr>
<td>Pt-600</td>
<td>-100°C to +600°C</td>
</tr>
<tr>
<td>Ni-100</td>
<td>0°C to +50°C</td>
</tr>
<tr>
<td>Ni-240</td>
<td>0°C to +120°C</td>
</tr>
<tr>
<td>Ni-600</td>
<td>0°C to +240°C</td>
</tr>
<tr>
<td>Ni-1200</td>
<td>0°C to +1200°C</td>
</tr>
</tbody>
</table>

- Isolation Voltage: 2500VRMS  
- Sampling Rate: 10 samples/sec  
- Input Wiring: 2, 3, or 4 wires  
- Power  
  - Requirement: unregulated +10V to +30VDC  
  - Power Consumption: 0.696W typical

**ND-6017**  
8-CH Analog Input Module  

### Analog Input  
- Channels: 6 Differential & 2 Single-ended  
- Input Type: mV, V, and mA  
- Input Range: ±15mV, ±50mV, ±100mV, ±500mV, ±1V, ±2.5V  
- Current Range: 0 to 20mA (with external 125Ω resistor)  
- Isolated Voltage: 2500V RMS  
- Sampling Rate: 3 samples/sec  
- Power  
  - Requirement: unregulated +10V to +10VDC  
  - Power Consumption: 0.96W typical

**ND-6018**  
8-CH Thermocouple Input Module  

### Analog Input  
- Channels: 6 Differential & 2 Single-ended  
- Thermocouple Type: J, K, T, E, R, S, B, N, C  
- Thermocouple Input Range  
  - J: 0°C-760°C  
  - K: 0°C-1,370°C  
  - T: -100°C-400°C  
  - E: 0°C-1,000°C  
  - R: 500°C-1,750°C  
  - S: 500°C-1,750°C  
  - B: 500°C-1,800°C  
  - N: -270°C-1,300°C  
  - C: -200°C-2,300°C  
- Internal CJC can be enable/disable  
- Voltage Range: ±15mV, ±50mV, ±100mV, ±500mV, ±1V, ±2.5V  
- Current Range: 0 to 20mA (with external 125Ω resistor)  
- Isolated Voltage: 2500VRMS  
- Sampling Rate: 3 samples/sec  
- Power  
  - Requirement: unregulated +10V to +10VDC  
  - Power Consumption: 0.96W typical

**ND-6021**  
Analog Output Module  

### Analog Output  
- Channels: 1  
- Voltage Output: -10V to +10V  
- Resolution: 12 bits  
- Accuracy: ±0.02% of FSR  
- Maximum current output: ±10µA  
- Gain Drift: 10ppm FSR/°C  
- Digital Input  
  - Channels: 7  
  - Switching Levels: TTL  
  - Internal Pull-up resistor: 10k  
- Power  
  - Requirement: unregulated +10V to +10VDC  
  - Power Consumption: 1.848W typical

**ND-6024**  
4-CH Analog Output Module  

### Analog Output  
- Channels: 4  
- Voltage Output: -10V to +10V  
- Resolution: 12 bits  
- Accuracy: ±0.02% of FSR  
- Maximum current output: ±10µA  
- Gain Drift: 10ppm FSR/°C  

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Digital Modules

**ND-6050**
Digital I/O Module
- **Channels:** 7
- **Switching Level:** TTL
- **Internal Pull-Up Resistor:** 10Ω
- **Maximum Current:** 0.5mA
- **Programmable input polarity**

**Digital Output**
- **Channels:** 8
- **Maximum Current Sink:** 1A
- **Maximum Power Dissipation:** 300mW
- **Programmable output polarity**
- **Programmable power on/safety state**

**Power**
- **Requirement:** unregulated +10V to +30Vdc
- **Power Consumption:** 0.336W typical

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**ND-6052**
8-CH Isolated Digital Input Module
- **Channels:** 8
- **Switching Levels (differential):**
  - Low (0): +1V (max.)
  - High (1): +3.5V~+24V
- **Internal Current Limit Resistor:** 1.2kΩ
- **Maximum Current:** 0.5mA
- **Isolated Voltage:** 5,000VRMS
- **Programmable input polarity**

**Power**
- **Requirement:** unregulated +10V to +30Vdc
- **Power Consumption:** 0.264W

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**ND-6053**
16-CH Digital Input Module
- **Channels:** 16
- **Dry Contact**
  - Logical level 0: close to GND
  - Logical level 1: open
  - Effective distance: 500m (max)
- **Wet Contact:**
  - TTL level
  - Internal Pull-Up Resistor: 10kΩ
  - Maximum Current: 0.5mA
  - Programmable input polarity

**Power**
- **Requirement:** unregulated +10V to +30Vdc
- **Power Consumption:** 0.408W typical

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**ND-6054**
15-CH Isolated Digital Input Module
- **Channels:** 15 bits digital input with
  - 24V external common power
- **Switching Level:**
  - Low (0): +1V (max.)
  - High (1): +3.5V~+24V
- **Internal Pull-Up Resistor:** 1.2kΩ
- **Isolated Voltage:** 5,000VRMS
- **Programmable input polarity**

**Power**
- **Requirement:** unregulated +10V to +30Vdc
- **Power Consumption:** 0.216W

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**ND-6056**
15-CH Isolated Digital Output Module
- **Channels:** 15 bits digital upon collector output with common ground
- **Switching Level:** with +24V common power
- **Maximum Load Current:** 1A
- **Isolated Voltage:** 3,750VRMS
- **Programmable Input polarity**

**Power**
- **Requirement:** unregulated +10V to +30Vdc
- **Power Consumption:** 1.32W
Digital Modules

ND-6058  
28-CH PPI Module

Programmable I/O
- 8255 programmable peripheral interface mode 0 emulation
- Channel: 24
- Input Signal
  - Logical level: 0.0V~0.8V
  - Logical level: 1.0V~5.25V
- Internal Pull-up Resistor: 10KΩ

Digital Input
- Channels: 4
- Logical level: 0.0V~2.0V
- Logical level: 2.0V~5.25V
- Power Requirement: unregulated +10V to +30VDC
- Power Consumption: 1.416W typical
- Connector: 50-pin Female SC0 I

ND-6063  
8-CH Relay Output Module

Relay Output
- Channels: 8 independent relay outputs
- Output Type: 8 Form A
- Contact Rating
  - AC 0.5A/250V
  - DC 3A/30V, 0.3A/110V
- ON/OFF Internal Time: 3 ms (at 20°C)
- Internal Insulation Resistance: 1000MΩ@500VDC
- Power: 8 x 10^5 (4A30VDC at 20cpm

ND-6067  
8-CH AC Relay Output Module

Relay Output
- Channels: 8 independent relay outputs
- Output Type: 8 Form A
- Contact Rating
  - AC 0.5A/250V
  - DC 3A/30V, 0.3A/110V
- ON/OFF Internal Time: 3 ms (at 20°C)
- Internal Insulation Resistance: 1000MΩ@500VDC
- Power: 8 x 10^5 (4A30VDC at 20cpm

ND-6060  
Relay Output & Digital Input Module

Relay Output
- Channels: 8 independent relay outputs
- Output Type: 8 Form A
- Contact Rating
  - AC 0.5A/250V
  - DC 3A/30V, 0.3A/110V
- ON/OFF Internal Time: 3 ms (at 20°C)
- Internal Insulation Resistance: 1000MΩ@500VDC
- Power: 8 x 10^5 (4A30VDC at 20cpm

ND-6080  
2-CH Counter/Frequency Input Module

Counter Inputs
- Channels: Two independent 32-bit counter
- Input Frequency: 20MHz max.
- Input Mode: Isolated or non-isolated
- Isolation Voltage: 5000Vrms
- Isolation Input Level
  - Logical level: 0.0V~0.8V
  - Logical level: 1.0V~5.25V
- Current Limit Resistor: 1.2KΩ
- Non-isolated Input Level programmable threshold
  - Logical level: 0.0V~0.8V (default = 0.8V)
  - Logical level: 1.0V~5.25V (default = 2.4V)
- Input Pulses Width: 5µ sec
- Power Requirement: 1.392W
- Power Consumption: 1.392W

Programmable Digital Noise Filter: 4µ sec to 1.02 msec
Alarm: alarm comparator on each counter
Input Pulse Width: 5µ sec
Max Count: 4,294,967,295 (32-bit)
Programmable Digital Noise Filter: 4µ sec to 1.02 msec
Alarm: alarm comparator on each counter
Frequency Measurement
- Range: 1Hz to 20kHz
- Programmable built-in gate time: 1.5ms, 1sec
Digital Output
- Channels: 2
- Open collector to 30V, 30mA max. load
- Power Requirement: unregulated +5V to +12VDC
- Power Consumption: 0.84W typical

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Introduction

ND-8511(D) is a single-port RS-232/422/485 to Ethernet data converter. Its compact sized communication module allows users to control serial devices (RS-232/422/485) over a TCP/IP-based Ethernet network. Users may connect host computer systems (Windows/2000/XP) to a native serial port through a TCP/IP Ethernet. With one asynchronous serial port connection on one end and a 10/100Mbps Ethernet connection on the other, ND-8511(D) also allows any device that primarily supports asynchronous communications protocol to attach to a network. ND-8511(D) works like an add-on single-port serial board to PC servers, but with advantages of the TCP/IP network protocol. With the ND-8511(D), users are able to control asynchronous serial devices from virtually any location. Serial devices connects through a virtual Ethernet link, but are recognized as a real COM port by Windows. ND-8511(D) can be used with existing applications, and comes with a utility program providing a simple step-by-step installation procedure and maintenance wizard that gives users easy access to asynchronous devices.

Specifications

CPU: 48MHz, 186-Based Controller 12.5MIPS
Serial Interface: 7 or 8 data bits; 1-2 stop bits; parity: odd, even, and none; software selectable baudrate (300-230400bps)
Modem Control: DTR, DCD, CTS, RTS
Flow Control: XON/XOFF (software), RTS/CTS (hardware)
Network Interface: RJ45 Ethernet 10base-T or 100base-TX (Auto-sensing)
Compatibility: Ethernet: Version 2.0, IEEE 802.3
Protocols support: ARP, UDP/IP, TCP/IP, Telnet, ICMP, SNMP, DHCP, BOOTP, TFTP, AutoIP, SMTP, and HTTP
Temperature: Operating range: -40°C to 85°C (-40°F to 185°F)
Relative Humidity: Operating: 5% to 95% non-condensing
Shock/Vibration: Non-operational shock: 500g’s, Non-operational vibration: 20g’s
Power: DC 10V to DC 30V

Applications

Industrial Control and Process system
CIM (Computer Integrated Manufacturing) system
Security Control system
Remote Control System

Supported Serial Devices

- ATM Machines
- CNC Controllers
- Data Collection Devices
- Universal Power Supply (UPS) Management Units
- Telecommunications Equipment
- Data Display Devices
- Security Alarms and Access Control Devices
- Handheld Instruments
- Modems
- Time/Attendance Clocks and Terminals

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Ordering Information

ND-8511/230V 1 Port RS-232/422/485 to Ethernet Data Converter with Power Adapter (Euro Spec.)
ND-8511/110V 1 Port RS-232/422/485 to Ethernet Data Converter with Power Adapter (USA Spec.)
ND-8511D/230V 1 Port RS-232 to Ethernet Data Converter with Power Adapter (Euro Spec.)
ND-8511D/110V 1 Port RS-232 to Ethernet Data Converter with Power Adapter (USA Spec.)
Accessories and Dimensions

- 50 Pin SCSI Connector Pin Assignment
- Connect DIN Socket with ND-6058

Dimensions

50 Pin SCSI

Connect DIN Socket with ND-6058

ND-6058+DIN-50S

Accessories and Dimensions

NuDAM Series

ND-8511

NuDAM Series

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