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

Windows® 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.
### 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><strong>Input</strong></td>
<td>RS-485/422 (Independent)</td>
<td>RS-232</td>
<td>USB</td>
<td>RS-422/485</td>
</tr>
<tr>
<td><strong>Speed</strong></td>
<td>300~115.2K</td>
<td>300~115.2K</td>
<td>300~115.2K</td>
<td>300~115.2K</td>
</tr>
<tr>
<td><strong>Power Input</strong></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><strong>Channels</strong></td>
<td>3</td>
<td>8</td>
<td>8</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td><strong>Input Type</strong></td>
<td>RTD</td>
<td>V , mA</td>
<td>Thermocouple, V , mA</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td><strong>Output Type</strong></td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>mA, V</td>
<td>V, 7 TTL input</td>
</tr>
<tr>
<td><strong>Sampling Rate</strong></td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td><strong>Power Input</strong></td>
<td>10V~30V</td>
<td>10V~30V</td>
<td>10V~30V</td>
<td>10V~30V</td>
<td>10V~30V</td>
</tr>
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</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><strong>Input Ch No.</strong></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><strong>Output Ch No.</strong></td>
<td>8</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>15</td>
<td>24(1)</td>
<td>4(Relay)</td>
<td>8(Relay)</td>
<td>8(AC Relay)</td>
</tr>
<tr>
<td><strong>Counter No. 2 Isolated</strong></td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>2 TTL</td>
</tr>
<tr>
<td><strong>Switch Level</strong></td>
<td>Low(0): +1 V max, High(1): +2.4 V ~ +5 V</td>
<td>Low(0): +1 V max, High(1): +2.4 V ~ +5 V</td>
<td>Common Power (+24 V)</td>
<td>Common Ground</td>
<td>Low(0): +1 V max, High(1): +2.4 V ~ +5 V</td>
<td>Low(0): +1 V max, High(1): +2.4 V ~ +5 V</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td><strong>Power Input</strong></td>
<td>10V~30V</td>
<td>10V~30V</td>
<td>10V~30V</td>
<td>10V~30V</td>
<td>10V~30V</td>
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<td>10V~30V</td>
<td>10V~30V</td>
<td>10V~30V</td>
<td>10V~30V</td>
</tr>
</tbody>
</table>

*Note(1): 24CW 8255 PPI mode 0 emulation*
Converter Modules

NDP-243, NDP-243U
Panel Mounting Power Supply
- **Input Voltage**
  - NDP-243: 85-132VAC or 170-264VAC, switchable
  - NDP-243U: 90-264VAC
- **Input Frequency**: 47-63Hz
- **Input Current**: 1.4A (max.)
- **Short Protection**
- **Output Voltage**
  - NDP-243: +24VDC ±10%
  - NDP-243U: +24VDC 1A, +12VDC 1A, +5VDC 3A
- **Output Current**: 3A (max.)
- **Overload Protection**
- **Dimensions**: 5” (L) x 3.8” (W) x 1.6” (H)
- **Operating Temperature**: 0°-55°C

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
- **Spans**: 115.2K, 230K, 38.4K, 19.2K, 9600, 4800, 2400, 1200, 600, 300
- **Auto baud rate and data format adjustment**
- **Isolation Voltage**: 2500Vrms
- **Surge protector on communications signals**
- **Connector**: Plug-in screw terminal block
- **Power Consumption**: 0.7W typical

ND-6520
RS-232 to RS-422/485 Converter
- **Protocol**
  - RS-422 (4-wire, full-duplex)
  - RS-485 (2-wire, half-duplex) protocol
- **Spans**: 115.2K, 230K, 38.4K, 19.2K, 9600, 4800, 2400, 1200, 600, 300
- **Auto baud rate and data format adjustment**
- **Isolation Voltage**: 2500Vrms
- **Auto baud rate and data format adjustment**
- **Isolation Voltage**: 2500Vrms
- **Surge protector on RS-232 to 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**: 0.75W 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-)
- **Spans**: 300-115.2K bps
- **Isolation Voltage**: 2500Vrms
- **USB 1.1 compliant**
- **Repeater Request**: Over 128 modules or distance over 4000 feet
- **Connector**: Female DB-9 and plug-in screw terminal block
- **Power Consumption**: 0.65W 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-)
- **Spans**: 1200-115200 bps (RS-232 and RS-422/485 can be set to different baud rates)
- **Convert RS-422/485 to RS-232 with configurable address**
- **Isolation Voltage**: 1500Vrms
- **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**: 0.75W typical
Analog Modules

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

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

<table>
<thead>
<tr>
<th>RTD Type</th>
<th>Temperature Range</th>
<th>Sensitivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pt</td>
<td>-100°C to +100°C = 0.00385</td>
<td></td>
</tr>
<tr>
<td>Pt</td>
<td>0°C to +100°C = 0.00385</td>
<td></td>
</tr>
<tr>
<td>Pt</td>
<td>0°C to +200°C = 0.00385</td>
<td></td>
</tr>
<tr>
<td>Pt</td>
<td>0°C to +600°C = 0.00385</td>
<td></td>
</tr>
<tr>
<td>Pt</td>
<td>-100°C to +100°C = 0.003916</td>
<td></td>
</tr>
<tr>
<td>Pt</td>
<td>0°C to +200°C = 0.003916</td>
<td></td>
</tr>
<tr>
<td>Pt</td>
<td>0°C to +600°C = 0.003916</td>
<td></td>
</tr>
<tr>
<td>Ni-100</td>
<td>0°C to +100°C</td>
<td></td>
</tr>
<tr>
<td>Ni-120</td>
<td>0°C to +100°C</td>
<td></td>
</tr>
<tr>
<td>2Ω</td>
<td>0°C to +60°C</td>
<td></td>
</tr>
</tbody>
</table>

- Isolation Voltage: 2500Vrms
- Sampling Rate: 10 samples/sec
- Input Wiring: 2, 3, or 4 wires
- Power: Requirement: unregulated +10V to +30V
- Power Consumption: 0.54W typical

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

- **Analog Input**
  - Channels: 6 Differential & 2 Singled-ended
  - Input Type: mV, V, and mA
  - Voltage Range: ±150mV, ±500mV, ±1V, ±5V, ±10V
  - Current Range: ±20mA (with external 125Ω resistor)
  - Isolated Voltage: 2500Vrms
  - Sampling Rate: 10 samples/sec

- Voltage Range: ±15mV, ±50mV, ±100mV, ±500mV, ±1V, ±2.5V
- Current Range: ±20mA (with external 125Ω resistor)
- Isolated Voltage: 2500Vrms
- Sampling Rate: 10 samples/sec

- Power: Requirement: unregulated +10V to +30Vdc
- Power Consumption: 1.00W typical

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

- **Analog Input**
  - Channels: 6 Differential & 2 Singled-ended
  - Input Type: Thermocouple, mV, V, or mA
  - Thermocouple Type: J, K, T, E, R, S, B, N, C
  - Thermocouple Input Range
    - J: 0°C-700°C
    - K: 0°C-1,370°C
    - T: -100°C-450°C
    - E: -50°C-1,000°C
    - R: 0°C-2,320°C
    - N: -270°C-1,300°C
    - C: Internal CJC can be enabled/disabled

- Power: Requirement: unregulated +10V to +30Vdc
- Power Consumption: 0.7W typical

**ND-6021**
Single Channel Analog Output Module

- **Analog Output**
  - Voltage Output: -10V to +10V
  - Current Output: 0-20mA, 4-20mA
  - Resolution: 12-bit output resolution
  - Accuracy:
    - ±0.1% of FSR (current)
    - ±0.2% of FSR (voltage)
  - Readback Accuracy: ±1% of FSR

- Programmable Output Slope
  - +0.125 to 128mA/sec
  - -0.125 to -128mA/sec
- Current Load Resistor: 0 to 500Ω

- Power: Requirement: unregulated +10V to +30Vdc
- Power Consumption: 1.50W typical

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

- **Analog Output**
  - Channels: 4
  - Voltage Output: -10V to +10V
  - Output Isolation: 2500Vrms
  - Resolution: 12-bit resolution
  - Accuracy: ±5/2 LSB
  - Gain Drift: ±5ppm/°C

- Digital Input
  - Channels: 7
  - Switching Levels: TTL
  - Pull-up Current: 5mA

- Power: Requirement: unregulated +10V to +30Vdc
- Power Consumption: 1.50W typical

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# Digital Modules

## ND-6050

**Digital Input**
- Channels: 7
- Switching Level: TTL
- Internal Pull-Up Resistor: 1MΩ
- Maximum Current: 0.5mA
- Programmable input polarity

**Digital Output**
- Channels: 3
- Open collector to 3V, 30mA max. load
- Programmable output polarity
- Programmable power on/safety state

**Power**
- Requirement: unregulated +15V to +30V
- Power Consumption: 0.1W typical

## ND-6052

**8-CH Isolated Digital Input Module**

**Digital Input**
- Channels: 8
  - 8 independent isolated channels
  - 2 isolated channels with common ground
- Switching Levels (differential)
  - Low (0): +1V (max.)
  - High (1): +3.5V to +24V
- Internal Current Limit Resistor: 1.2kΩ
- Maximum Current: 0.5mA
- Isolated Voltage: 5,000V RMS
- Programmable input polarity

**Power**
- Requirement: unregulated +15V to +30V
- Power Consumption: 0.17W

## ND-6053

**16-CH Digital Input Module**

**Digital Input**
- 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: 1MΩ
- Maximum Current: 0.5mA
- Programmable input polarity

**Power**
- Requirement: unregulated +15V to +30V
- Power Consumption: 0.3W typical

## ND-6054

**15-CH Isolated Digital Input Module**

**Digital Input**
- Channels: 15 bits digital input with 24V external common power
- Switching Level:
  - Low (0): +1V (max.)
  - High (1): +3.5V to +24V
- Internal Pull-Up Resistor: 1.2kΩ
- Maximum Current: 0.5mA
- Isolated Voltage: 5,000V RMS
- Programmable input polarity

**Power**
- Requirement: unregulated +15V to +30V
- Power Consumption: 0.25W

## ND-6056

**15-CH Isolated Digital Output Module**

**Digital Output**
- Channels: 15 bits digital open collector output with common ground
- Switching Level: with +24V common power
- Maximum Load Current: 200mA
- Isolated Voltage: 5,000V RMS
- Programmable input polarity

**Power**
- Requirement: unregulated +15V to +30V
- Power Consumption: 0.25W
**Digital Modules**

**ND-6058**

28-CH PPI Module

- Programmable I/O
  - 3255 programmable peripheral interface mode 0 emulation
- Channel: 24
- Input Signal
  - Logical level 0: 0-2.5-5.5V
  - Logical level 1: 2.5-3.2-5.5V
- ON/OFF Interval Time: 3 ms
- Internal Insulation Resistance: 1000M Ω @500V DC

**ND-6060**

Relay Output & Digital Input Module

- **Relay Output**
  - Channels: 4 relay outputs
  - Output Type: 2 Form C and 2 Form A
  - Contact Rating
    - AC 0.6A/125V
    - DC 2A/30V
    - 0.6A/110V
  - ON/OFF Interval Time: 3 ms
  - Internal Insulation Resistance: 1000M Ω
- **Digital Input**
  - Channels: 4
  - Common External Voltage: +5V or GND
  - Current Limit Resistor: 2.2k Ω
  - Isolation Voltage: 5000V RMS
  - Input Type: Switch or Transistor
  - Programmable input polarity
  - Power Requirement: unregulated +15V to +30V
  - Power Consumption: 0.7W typcal
  - Connector: 50-pin Female SCSI II

**ND-6063**

8-CH Relay Output Module

- **Relay Output**
  - Channels: 8 independent relay outputs and 3 common source relay outputs
  - Output Type: 8 Form A
  - Contact Rating
    - AC 3A/250V
    - DC 3A/30V
    - 0.6A/110V
  - ON/OFF Interval Time: 3 ms
  - Internal Insulation Resistance: 1000M Ω
  - Expected Life: 2x10^5 (1A 30V DC resistive)
  - Programmable output polarity
  - Programmable output power on/safety state
- **Digital Input**
  - Channels: 4
  - Common External Voltage: +5V or GND
  - Current Limit Resistor: 2.2k Ω
  - Isolation Voltage: 5000V RMS
  - Input Type: Switch or Transistor
  - Programmable input polarity
  - Power Requirement: unregulated +15V to +30V
  - Power Consumption: 1.0W typical

**ND-6067**

8-CH AC Relay Output Module

- **Relay Output**
  - Channels: 8 independent relay outputs and 3 common source relay outputs
  - Output Type: 8 Form A
  - Contact Rating
    - AC 3A/250V
    - DC 3A/30V
    - 0.6A/110V
  - ON/OFF Interval Time: 3 ms
  - Internal Insulation Resistance: 1000M Ω
  - Expected Life: 2x10^5 (1A 30V DC resistive)
  - Programmable output polarity
  - Programmable output power on/safety state
- **Digital Input**
  - Channels: 4
  - Common External Voltage: +5V or GND
  - Current Limit Resistor: 2.2k Ω
  - Isolation Voltage: 5000V RMS
  - Input Type: Switch or Transistor
  - Programmable input polarity
  - Power Requirement: unregulated +15V to +30V
  - Power Consumption: 1.0W typical

**ND-6080**

2-CH Counter/Frequency Input Module

- **Counter Inputs**
  - Channels: Two independent 32-bit counter
  - Input Frequency: 100kHz max.
  - Input Mode: isolated or non-isolated
  - Isolation Voltage: 5000V RMS
  - Isolation Input Level
    - Logical level 0: -1V max
    - Logical level 1: 3.5V to 30V
  - Isolation Input Level programmable threshold
  - Current Limit Resistor: 1.2kΩ
  - Non-isolated Input Level programmable threshold
    - Logical level 0: 0V to 3.5V (default = 0.8V)
    - Logical level 1: 0V to 30V (default = 2.4V)
  - Input Pulse Width: > 1µs
  - Max Count: 4,294,967,295 (32-bit)
  - Programmable Digital Noise Filter: 4µs to 1.02 msec
  - Alarm: alarm comparator on each counter

- **Frequency Measurement**
  - Range: 1Hz to 100kHz
  - Programmable built-in gate time: 1.0/0.1sec

**Digital Output**

- Channels: 2
  - Open collector to 30V, 30mA max. load
- Power
  - Requirement: unregulated +15V to +30VDC
  - Power Consumption: 1.0W
**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 the 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

**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.)

**Features**

- 48MHz, 186-Based Controller 12.5MIPS
- Auto sensing 10/100Base-T Ethernet
- High speed serial port (up to 230kbps) with hardware and modem flow controls
- 3 digital I/O pins (software selectable, shared with serial port signal)
- Compact size for easy integration
- TCP/IP, UDP, DHCP, SNMP, Telnet, ARP, ICMP, and TFTP Protocol Support
- E-Mail function (send only)
- Support for flow & modem control signals
- Module configuration utility
- Windows native COM drivers support, compatible with existing serial software

**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

**Applications**

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

50 Pin SCSI Connector Pin Assignment

Connect DIN Socket with ND-6058

Dimensions

NuDAM Series