NuDAM -6024 4-Channel Analog Output Module

1. Introduction

ND-6024 is a 4 channels bipolar analog signal output module. It receives the digital command from host computer through RS-485 network. A microprocessor is used to convert the digital command to digital value to send to DAC. The DAC converts the digital value into analog form.
The ND-6024 is designed for safety. It provides many safety functions such as watchdog, and power on safe value.
Another safety function is the watchdog. Whenever the host is loss contact with the remote NuDAM module, or the micro-processor is down, the module will reset itself and send the safety value to the analog output therefore the industry safety is guarantee. The safety value / power-up value can be set by configuration software.

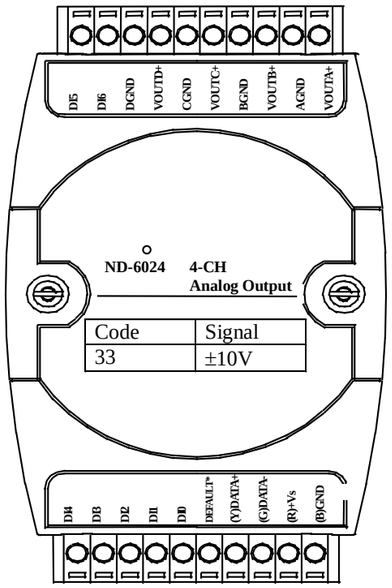
Features

- 4 bipolar analog output channels
- 7 TTL input channels
- programmable host watchdog timer for host failure protection
- internal watchdog timer for device failure protection
- easy programming by software
- easy installation and wiring

Specifications

- Interface:
  RS-485, 2 wires
  Speed (bps): 600, 1200, 2400, 4800, 9600, 19.2k, 38.4k, 57.6k, 115.2k
- Analog Output:
  Channels: 4
  Signal output type: differential
  Accuracy: +/-0.02% of FSR(max.)
  Output current: ±10uA (max.)
  DAC Resolution: 12 bits
  Output Range:+/-10v Voltage output
- Digital Input:
  Channels: 7
  Input type: TTL
- Storage Temperature Range: -25 to 80 °C
- Operating Temperature Range: -10 to 65 °C
- Power Requirement: +10V to +30V_{DC} Unregulated with against power reversal
- Power Consumption: 1.9W
- Case: ABS with captive mounting hardware
- CE Class A Conformity

2. Pin Assignment



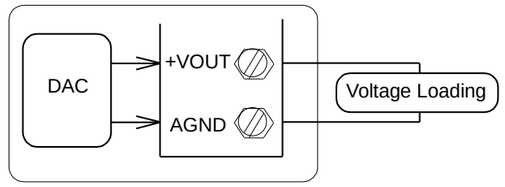
Pin Definitions

Pin #	Signal Name	Description
1	DI4	Digital input channel 4
2	DI3	Digital input channel 3
3	DI2	Digital input channel 2
4	DI1	Digital input channel 1
5	DI0	Digital input channel 0
6	DEFAULT*	Initial state setting
7	(Y)DATA+	RS-485 signal, positive
8	(G)DATA-	RS-485 signal, negative
9	(R)+VS	Power supply, +10V ~ +30Vdc
10	(B)GND	Ground
11	VOUTA+	Voltage output A
12	AGND	Analog ground
13	VOUTB+	Voltage output B
14	BGND	Analog ground
15	VOUTC+	Voltage output C
16	CGND	Analog ground
17	VOUTD+	Voltage output D
18	DGND	Analog ground
19	DI6	Digital input channel 6
20	DI5	Digital input channel 5

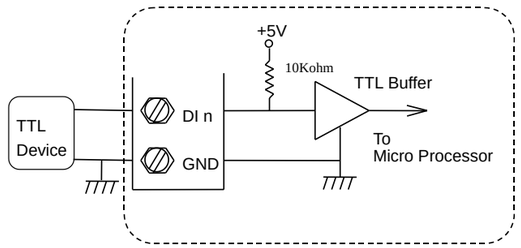
The module is in DEFAULT mode when DEFAULT* pin connected to GND while applying power on the module.
Do not apply any power signal to DEFAULT* pin, just left it open or connected it to GND.

3. Application Wiring

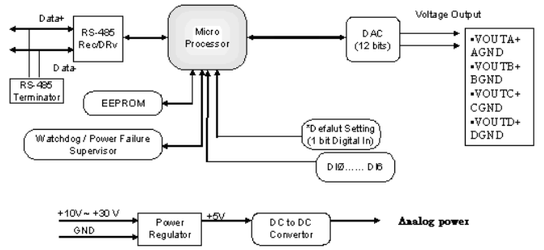
Differential Voltage Output



TTL Input



4. Functional Block Diagram



5. Installation

Equipment for Installation

A existing RS-485 network
NuDAM modules
DC Power supply (+10V~+30V)
Wires for power, communication and I/O signal

Installation Procedure

1. Configure every single NuDAM module under the administration utility.
2. The baud rate setting and calibration procedure must be done under the DEFAULT* mode.
3. The baud rate and check-sum status must be identity with the application network. The address ID must not be conflict with other modules on the network.
4. Plug the new module to the existing network.
5. Use the NuDAM administration utility to check the entire network.

6. Command Set

There are three categories of NuDAM commands. The first is the ***general commands***, including set configuration command, read configuration, reset, read module's name or firmware version, etc. Every NuDAM can response to the general commands. The second is the ***functional commands***, which depends on functions of each module. Not every module can execute all function commands. The third is the ***special commands*** including functions about the programmable watchdog timer, safe values, and the programmable leading code. All the commands used in the NuDAM analog input module are list in the following table.

Command	Syntax
General Command	
Set Configuration	**%(OldAddr)(NewAddr)(InputRange)(BaudRate)(DataFormat)**
Read Configuration	**$(Addr)2**
Read Module Name	**$(Addr)M**
Read Firmware Version	**$(Addr)F**
Reset Status	**$(Addr)5**
Software Reset	**$(Addr)RS**
Functional Command	
Analog Data Out	**#(Addr)(Port)(OutData)**
Save Power on Analog Value	**$(Addr)4**
Last Value Read Back	**$(Addr)6(Port)**
Digital Input	**$(Addr)8**
Synchronized Sampling	**#****
Read Synchronized Sampling	**$(Addr)9**

Special Command	
Read Command Leading Code Setting	**~(Addr)0**
Change Command Leading Code Setting	**~(Addr)10(C1)(C2)(C3)(C4)(C5)(C6)**
Set Host Watchdog / Safety Value	**~(Addr)2(Flag)(TimeOut)(SafeA) (SafeB)(SafeC) (SafeD)**
Read Host WatchDog / Safe Value	**~(Addr)3**
Host is OK	**~****
I/O Polarity Setting	**~(Addr)CP(State)**
Read Polarity Setting	**~(Addr)CR**

**** The module accepts calibration command, baud rate and checksum configuration setting under the DEFAULT* mode.***

**** Please refer the manual in PDF file format in the CD for detail description of these commands.***

7. ADLINK on the Internet

The full version manual can be download from website http://www.adlink.com.tw/download/manual/index.htm#6000

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