NuDAM -6018 Thermocouple Analog Input Module

1. Introduction

NuDAM-6018 is a thermocouple input module with 8 input channels. Six of the eight channels are differential and the other two are single ended type.

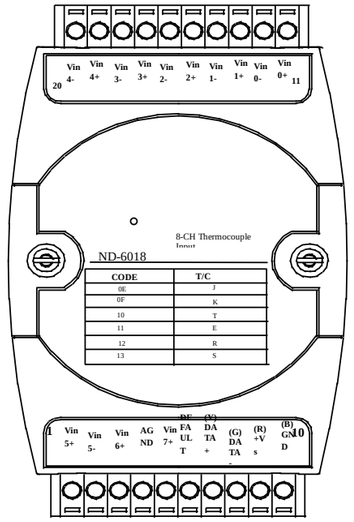
Features

- 8 analog input channels
- 6 differential input and 2 single ended input
- programmable input range
- programmable host watchdog timer for host failure protection
- on board CJC for temperature measurement
- 2500 Vrms analog input isolation
- 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 Input:
  Differential channels: 6
  Single ended channels: 2
  Resolution: 16 bits
  Accuracy: ±0.05%
  Sampling rate: 10
  Unit conversion: thermocouple, mV, V or mA
  Thermocouple type: J, K, T, E, R, S, B, N and C
  J: 0°C ~ 760°C K: 0°C ~ 1370°C
  T: -100°C ~ 400°C E: 0°C ~ 1000°C
  R: 500°C ~ 1750°C S: 500°C ~ 1750°C
  B: 500°C ~ 1800°C N: -270°C ~ 1300°C
  C: 0°C ~ 2320°C
  Voltage range: programmable 6 levels:
  ±2.5V, ±1V, ±500mV, ±100mV, ±50mV, ±15mV
  Current measurement: 20mA (with external 125 ohm resistor)
  Isolation Voltage: 2500 Vrms
  Note: The maximum input voltage shall not exceed to ±30V with reference to AGND otherwise, they may cause an unrecoverable harm to the hardware component.
- Storage Temperature Range: -25 to 80 °C
- Operating Temperature Range: -10 to 70 °C
- Power Requirement: +10V to +30V_{DC} Unregulated with against power reversal
- Power Consumption: 0.70W
- Case: ABS with captive mounting hardware
- CE Class A Conformity

2. Pin Assignment



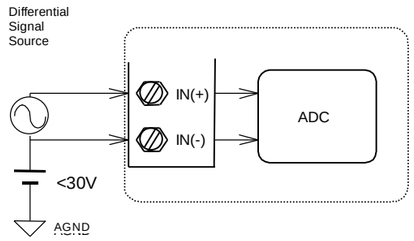
Pin Definitions

Pin #	Signal Name	Description
1	Vin5+	Differential positive input channel 5
2	Vin5-	Differential negative input channel 5
3	Vin6+	Single-ended input channel 6
4	AGND	Analog signal ground of channel 6 & 7
5	Vin7+	Single-ended input channel 7
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	Vin0+	Differential positive input channel 0
12	Vin0-	Differential negative input channel 0
13	Vin1+	Differential positive input channel 1
14	Vin1-	Differential negative input channel 1
15	Vin2+	Differential positive input channel 2
16	Vin2-	Differential negative input channel 2
17	Vin3+	Differential positive input channel 3
18	Vin3-	Differential negative input channel 3
19	Vin4+	Differential positive input channel 4
20	Vin4-	Differential negative input channel 4

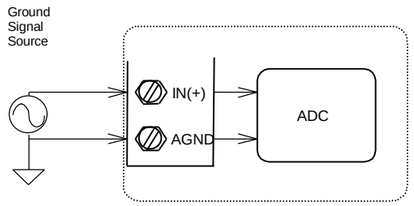
The module is in DEFAULT mode when DEFAULT* pin connected to GND while applying power on the module.
Do not apply any power signal to DEFAULT* pin, just left it open or connected it to GND.

3. Application Wiring

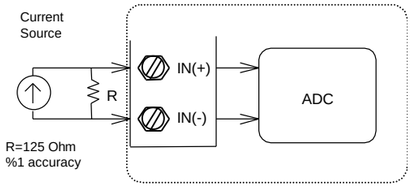
Differential Voltage Input



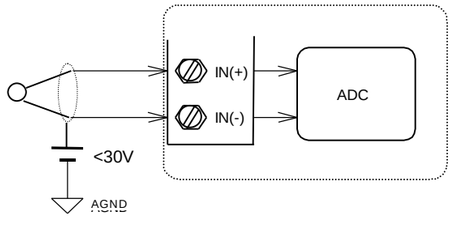
Single Ended Voltage Input



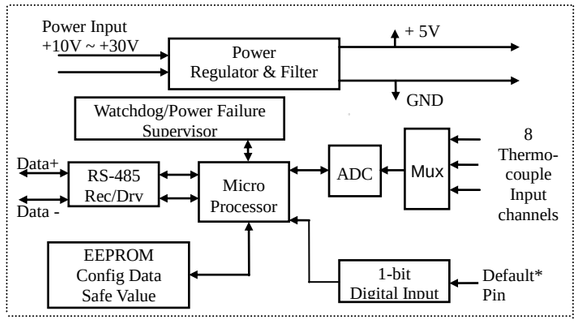
Current Input Measurement



Thermocouple Input Measurement



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

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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	**$(Addr)F**
Software Reset	**$(Addr)RS**
Functional Command	
Span Calibration	**$(Addr)0**
Offset Calibration	**$(Addr)1**
Read Analog Data From Channel N	**#(Addr)(Channel No)**
Read All Analog Data	**#(Addr)A**
Enable/Disable Channel for Multiplexing	**$(Addr)5(ChannelVal)**
Read Channel Status	**$(Addr)6**
Read CJC Status	**$(Addr)3**
Enable/Disable Internal CJC	**$(Addr)C(Status)**
Read Enable/Disable Internal CJC Status	**$(Addr)D**

**** 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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