Multi channels analog input module

DAM-7021

Four Channel Analog Input Module Datasheet

User's Manual

Overview:

DAM module is a new generation data acquisition and control system based on modular embedded systems. Adopting standard DIN35 rail mounting package is simple, flexible respond to various field applications. They establish networks through RS485, RS422/RS232, Ethernet and other means of communication.

DAM-7021 is the analog input series module, can simultaneously capture four differential or single-ended signal. The acquisition accuracy is up to 16 bit. Widely used to collecting various voltage and current signals on industrial site. Such as signals from a variety of sensors, transmitters, thermocouple can be gathered through it.

DAM-7021 is with galvanic isolation technology and watchdog technology, effectively guaranteeing safe and reliable equipment operation.

Product Features:

- embedded real-time operating system
- Input signal range: ± 20mA, ± 10V, ± 5V ± 2.5V, ± 1V, ± 200mV, ± 100mV, ± 50mV
- Input Channels: 2 channel
- AD converter resolution: 16 Bit
- Measuring Accuracy: ± 0.1% (typical)
- Sampling rate: 20 times / sec (all channels)
- Wide range power supply: 8 - 40V DC
- Address / Baud rate / range configurable by the user
- Supports MODBUS RTU protocol
- ± 15KV ESD protection
- Isolation voltage: 3000V DC
- Operating temperature range: -40 ℃ - 85 ℃
- Industrial grade plastic shell, the standard DIN35 rail mounting

Products Application:

- Remote monitoring and data acquisition
- Intelligent Building Control
- Security Products and Security Project
- Industrial control on site
- Warehousing and monitoring
- Medical, industrial product development
- Food and beverage industry
- Packaging and Material Transfer
- Electronics Manufacturing
- Smart home system

Multi channels analog input module

Model Series:

Model NO.:	Function type
DAM-8021	24 bit 2 channel analog input
DAM-8041	24 bit 4 channel analog input
DAM-8081	24 bit 8 channel analog input
DAM-7011	16 bit 1 channel analog input
DAM-7021	16 bit 2 channel analog input
DAM-7041	16bit 4 channel analog input
DAM-DA	12bit 1 channel rs232/rs485 input

1. DAM Series data acquisition control system Introduction

DAM module is a new generation data acquisition and control system based on modular embedded systems, which adopting standard DIN35 rail mounting package is simple, flexible respond to various field applications.

DAM series modules include analog signal input and digital signal input two categories. Analog signal input includes current signal input, voltage signal input, thermocouple signal input etc, such as ±20mA，±10V，±5V，±2.5V，±1V，±200mV, ±100mV，±50mV multiple range, thermocouple signal support J/ K/ T/ E/ R/ S/ B type; Digital signal input module receive RS485/RS232/RS422 signals from host computer to 0-10V, 0-5V, 0-20mAetc analog signal.

DAM-7021 module can establish networks through RS485, RS422/RS232, Ethernet and other means of communication. Widely used to collecting various voltage and current signals on industrial site. Such as ±10V、±20mA signals from a variety of sensors, transmitters, thermocouple can be gathered through it, then via network to achieve the remote monitoring and control.



Figure 1 DAM distributed data acquisition system

2. DAM analog input module

2.1 Function Introduction

DAM-7021 is the analog input series module, can simultaneously capture four differential or single-ended signal. The acquisition accuracy is up to 16 bit. Widely used to collecting various voltage and current signals on industrial site. Such as signals from a variety of sensors, transmitters, thermocouple can be gathered through it. DAM-7021 physical image:



Figure 2.1 DAM-7021 Module physical pictures

2.1.1 High precision data acquisition

DAM-7021 using advanced △-Σ high precision integration digital analog converter, the resolution is up to 24bit, measuring accuracy is beyond 0.1% (typical value), low input current (100pA). User can calibrate the module on site through simple command to improve measuring accuracy. Able to meet higher measurement requirements of industrial site and security, smart buildings, smart home system, power monitoring, process control and other industries occasions.

2.1.2 Programmable Address/Baud rate

DAM-7021 can establish network through RS485/RS232/RS422/CAN and Ethernet etc, communication methods, its module address and baud rate can configuration via ASCII command, convenient to organize distributed data acquisition system.

2.1.3 Power Isolation

By DC-DC converter, to realize power isolation between measuring circuit and master control circuit, together with optical isolation to achieve full electrical isolation. At the same time restrain the noise crosstalk between analog circuit and digital circuit, to improve EMC character.

2.1.4 Optical isolation

Products designed for industrial applications, the internal input and output unit using optical isolation between the control unit, and the input signal filtering measures taken, which greatly reduces the disturbances affecting to the normal operation of the module on industrial field, make the module has a good reliability.

2.1.5 Surge protection

There is TVS tube inside the module, can active suppression all kinds of surge pulse, protect the module work reliable in the rugged surroundings.

2.1.6 Initiate the module

The module is with unified default factory settings. Configuration as follows:

Address: 01H

Baud Rate: 9600 bps

Communication protocol: Custom ASCII protocol

Checksum: Disabled.

when user do not know exact module address, baud rate and other parameters, leading to the module can not work; CONFIG pin can be shorted to ground, to make the module back to the initialization state. Specific steps are as follows:

1, disconnect the power, short CONFIG pin to ground.

2, re-power onto the module, the module is under configured state, can be configured via ASCII commands to the appropriate address, baud rate, communication protocols, checksum and other parameters.

3, disconnect the power, disconnect the CONFIG pin to ground, re-power, the module has been restored to normal operation.

In the configuration mode, the module's communication parameters are as follows:

Address: 01H

Baud Rate: 9600bps

Communication protocol: Custom ASCII protocol

Checksum: Disabled

2.1.7 Naming Rule:

DAM Series Naming consists of product name code, series number, channel number and function version number fours parts. For example: DAM-7021 means:

DAM: Product name code

8: Series number; 8 series is single measuring range module, support RS232/RS485 interface, standard MODBUS RTU protocol.

04: Channel number, support 1-16 channel input.

1: Version Number

2.2 Functional Block Diagram

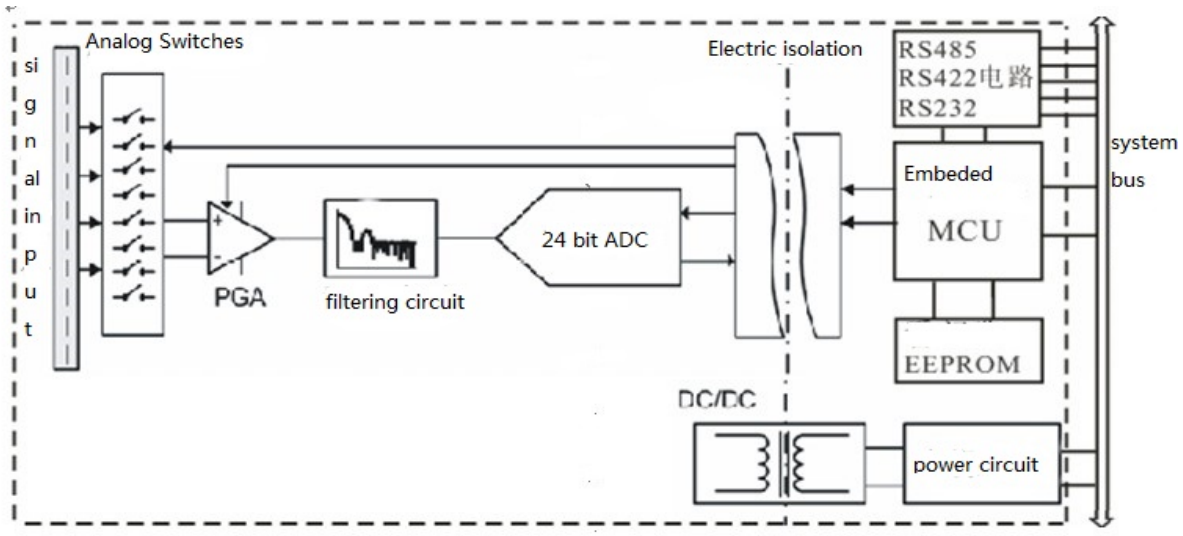


Figure 2.2 DAM-7021Functional Block Diagram

2.3 Technical Parameter

2.3.1 Analog signal input

- ◆ Number of input channels: 2 differential or four single-ended inputs
- ◆ Input Range: ± 20mA, ± 10V, ± 5V, ± 2.5V, ± 1V, ± 200mV, ± 100mV, ± 50mV
- ◆ Sampling rate: 20 times / sec (all channels)
- ◆ AD converter resolution: 16 Bit
- ◆ Accuracy: ± 0.1% (typical)
- ◆ input port with overvoltage protection, over current protection, and a low-pass filter

2.3.2 System Parameter:

- ◆ CPU: low-power microprocessor, RISC architecture
- ◆ embedded real-time operating system
- ◆ Isolation voltage: 3000V DC
- ◆ ± 15KV ESD protection
- ◆ Wide range power supply: +8 - +40 V DC
- ◆ Power consumption: less than 1W
- ◆ Common mode rejection (CMR): 120 dB (1kΩ Source Imbalance @ 50/60 Hz)
- ◆ Normal mode rejection (NMR): 60 dB (1kΩ Source Imbalance @ 50/60 Hz)

Multi channels analog input module

- ◆ Working temperature: -40 ℃ - +80 ℃
- ◆ Industrial grade plastic shell, standard DIN35 rail mounting

2.4 Pin Definition

2.4.1 Pin Configuration

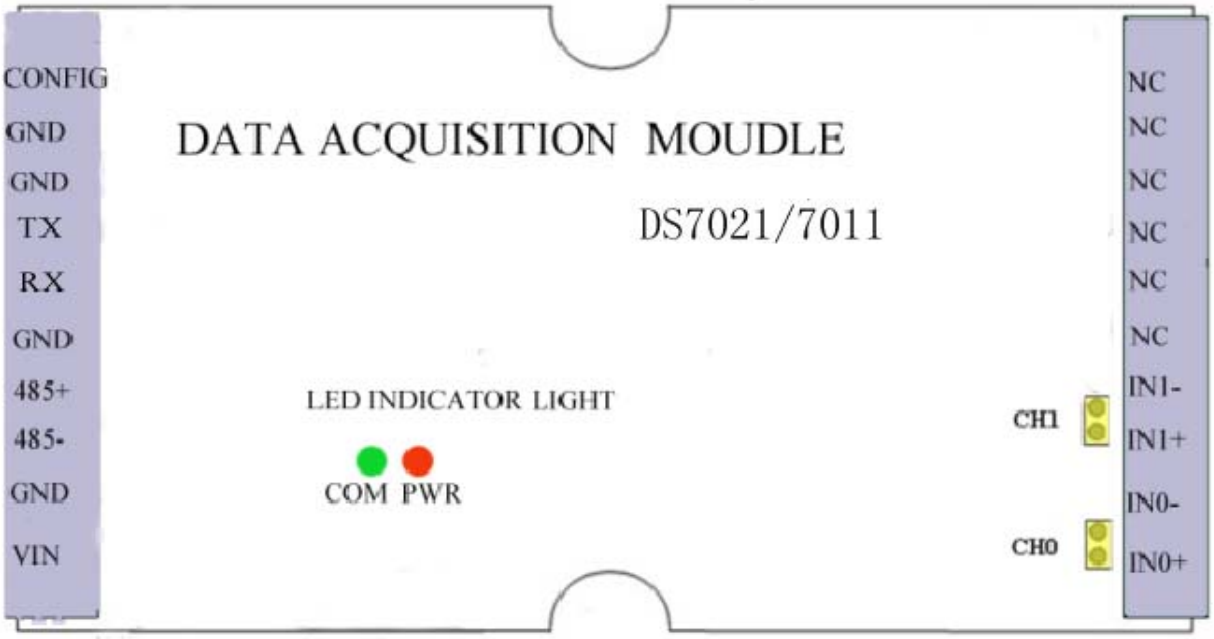


Figure 2.3 DAM-7021Module Pin configurations

2.4.2 Pin Description

Form 2.1 DAM-7021Pin Definitions 1

PIN Type	Pin NO.	Pin Name	Pin Function
POWER	1	VIN	Power input+
GND	2	GND	Power GND
DI/DO	3	485-	RS485 input signal-
DI/DO	4	485+	RS485 input signal+
GND	5	GND	Power GND
DI	6	RX	RS232 RX terminal
DO	7	TX	RS232 TXD
GND	8	GND	Power GND
GND	9	GND	Power GND
DI	10	CONFIG	Configuration Port

Form 2.2 DAM-7021 Module Pin Definitions 2

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PIN Type	Pin NO.	Pin Name	Pin Function
NC	11	NC	Reserve
NC	12	NC	Reserve
AI	13	NC	Reserve
AI	14	NC	Reserve
AI	15	NC	Reserve
AI	16	NC	Reserve
AI	17	IN1-	Analog input channel 1-
AI	18	IN1+	Analog input channel 1+
AI	19	IN0-	Analog input channel 0-
AI	20	IN0+	Analog input channel 0+

2.5 Communication Protocol

2.5.1 Communication interface

DAM-7021 module can build network through standard RS232/RS485/RS422 etc communication interface. DAM-7021 can support RS232/RS485 at the same time. DAM-8043 support RS485 interface, user can notify when choose model.

2.5.2 Custom ASCII Protocol:

DAM module support custom ASCII protocol, user can easily read the measurement data and configuration module parameters through simple ASCII commands, such as address (0x00 - 0xFF), baud rate (300bps, 600bps, 1200bps, 2400bps, 4800bps, 9600bps , 19200bps, 38400bps, 57600bps, 115200bps), checksum status, open or close the channel and so on. When conditions permit, user can also calibrate the module on field through ASCII commands. Its instruction set compatible with the ADAM modules. Detailed description of ASCII commands refer to DAM Series Module User Command Reference Manual.

2.5.3 MODBUS RTU Protocol

DAM-7021 module supports industry standard MODBUS RTU protocol, after module via ASCII commands configured for MODBUS RTU protocol, can work on MODBUS slave state. Supported MODBUS commands include 03 and 06, can both to read a single register and preset single register. It can be achieved with a variety of brands of PLC, RTU or computer monitoring software for network communication.

MODBUS commands detailed description, please refer to DAM Series Module User Command Reference Manual.

2.6 Electric Spec.:

DAM-7021 data acquisition module Electric Spec are as follows, if not special remark, all parameter's value is Tamb=25℃

Term	Parameter	Min	Typ	Max	Unit
Input voltage	Vin	+8	--	+40	V
Resolution rate	Resolution		16		bit
Accuracy grade	Accuracy		±0.1		% of SFR
Zero Drift	Zero Drift	-50		+50	uV/℃
Temperature coefficient	Temperature Coefficient			±50	ppm/℃
Input Protect	Input Protect		100/60		mA/V
Differential Nonlinearity	Differential Nonlinearity			±1	LSB
Isolation Voltage	Isolation Voltage			3000	Vdc
Watchdog reset circle	Watchdog Period		1		S
Input impedance	Load Impedance		2M		Ω

2.7 Machinery Specification

2.7.1 Machinery Dimension:

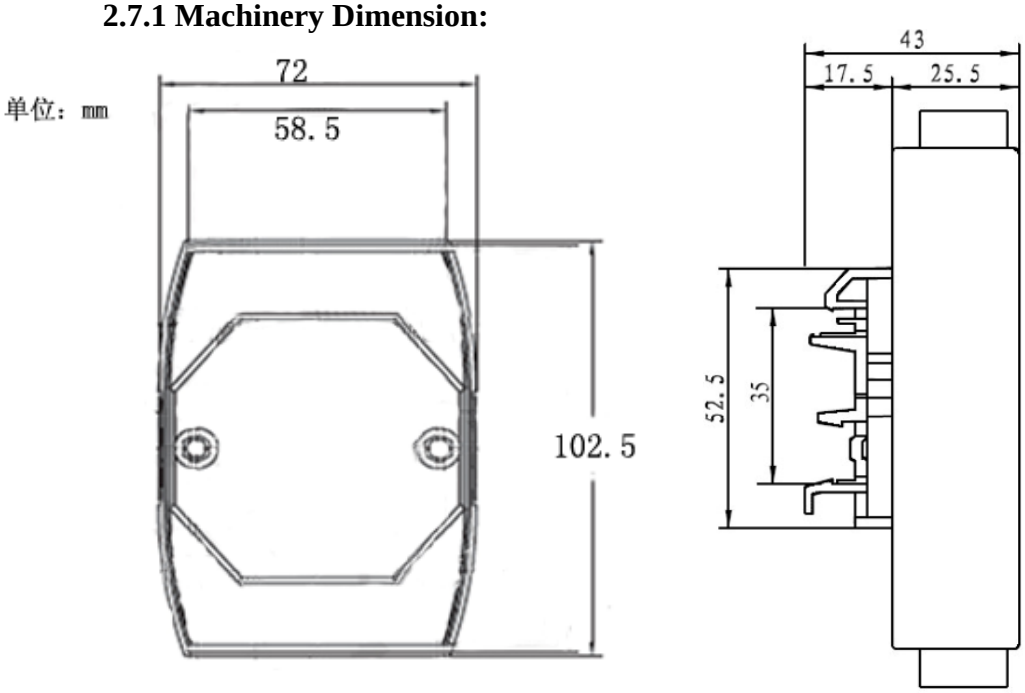


Figure 2.5 DAM-7021 Outline Dimensional Drawing

2.7.2 Installation

DAM-7021 support DIN35 Rail Mounting, user can easily install and disassemble, providing convenience help to industrial field use and install.

3. Three Guarantees and maintenance instructions

The products within two years from the date of sold any user in compliance with the storage, transport and use of product, if damaged under the conditions required, or product quality lower than technical specifications, can be returned for a free repair. For breach of operational rules and requirements caused the damage, need to pay components fees and maintenance fees for device.

4. Disclaimer

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Multi channels analog input module

Appendix 1, DAM analog input module Model Selection:

Remark：DIN35 means support 35# Din-rail mounting.

Model Selection Instruction：

DAM module support multi Range, user can define analog signal input range, input range code is as below form:

Range Code	Measuring Range	Type
I1	±20mA	A、B
I2	±50mV	A
I3	±100mV	A、B
I4	±200mV	B
I5	±1V	A
I6	±2.5V	A、B
I7	±5V	A、B
I8	±10V	B
I9	User-Define	-

User can choose single range and multi-range according to demand, single range support 8 kinds of analog signal input as above form and user-define signal. Can customized special module for customers according to customer's requirements. Multi-range module divided into A type and B type, both support 6 kinds of range at the same time.

Contact us◆

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