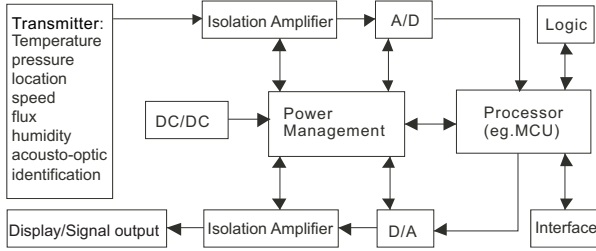




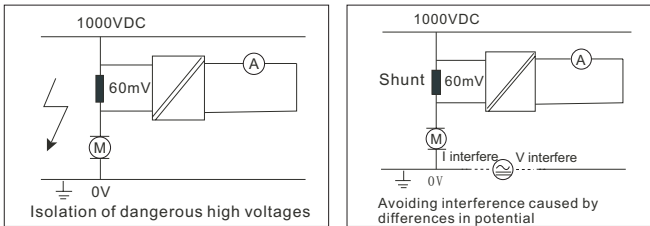
1. Functions

Isolation amplifier module can change the DC voltage, current signal to different isolated DC voltage or current signal at linear proportional.

1.1: On most occasions of MCU applications, transmitters are widely used to translate the signals, which can't be measured directly by MCU, into electrical analog signal which can be processed by MCU easily. There are current transmitter, press transmitter, temperature transmitter, flow rate transmitter, etc. Typical application is as follows:

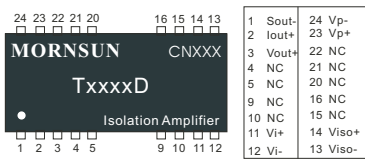


1.2: In modern electric measurement and controlling, usually, we will use low-voltage instrument to measure and control high-voltage, heavy current and something like analog signals. If there is no isolation between the digital signal and those analog signals, the high-voltage, heavy current will easily merge into low-voltage instrument and cause terrible damage and even safety accidents. schematic diagram is as below:



2. The typical applications

MORNSUN Isolation amplifier module pins functions as follows (Active voltage signal input models with one channel isolation power output):



Remark:

This pins functions were in available to DIP24/SMD24 general series, DIP16/SMD16 small size series is different from this. The actual functions are subject to technical manual.

2.1 Power supply

Vp+, Vp- are the inputs pins of power supply, Vp+ is the positive electrode, while Vp- is the negative, ± 5% voltage precision, if the voltage errors is too large, the Isolation amplifier module can work normally, but can't be assured long-term stability and normal signal drive capacity. Please pay attention to the polar of input signal during connection; Very low supply voltage will not do any damage to equipment, but the driving capacity is not well guaranteed. The supply voltage should not exceed +15% of the nominal value, or it will do damage to the instrument. We recommend connecting a power protection circuit at the input end to protect the module.

2.2 Isolation power output

Viso+ & Viso- is the output pin, Viso+ is the positive output of micro isolation power output, Viso- is the negative. Our isolation power output can offer 30mA output current, suitable to the power supply of input sensor or front processing circuit. Isolation power

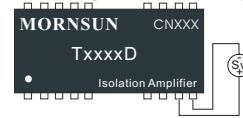
output can also be connected with current loop to meet the requirement of two-wire translator. The output of this isolation power output is non-regulated, if the front circuit requires regulation, then connect an external LDO or three-port regulator. If the isolation power output is not needed, then just keep it suspended. No need to connect external capacitor if there is no highly requirement of isolation power output. If want to reduce the ripple of isolation power output, the external capacitance value should be within 4.7μF, or using regulator IC to realize it. Besides, the specification of isolated output must match the power specification of instruments to avoid the damage to the field instruments.

2.3 Input signal

Vi+ is the positive electrode of input signal, Vi- is the negative electrode of output signal.

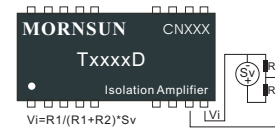
a: Real input measurement range is the same as assigned value of input & output signal measurement range.

The connection is showed as below, Sv is voltage signal source, which can access the input signal end directly.



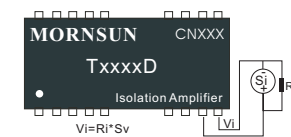
b: Real input measurement range is larger than the assigned signal value.

The solution is as below: Sv is voltage signal source, which can access the input signal end by driver a sampling resistance, because the input independence is very high, so the connection will not effect the module's input signal.



C: Current signal input

The solution is as below: Si is current signal source, according to ohm law, the current signal will be converted into voltage signal by sampling resistance Ri, then can access the input end directly. The input voltage measurement range can be got by choosing proper sampling resistance value. It will not do any effect to the input signal because of the module's high input independence. The sampling resistance will not be needed if it's current signal input series which can access the input end directly.

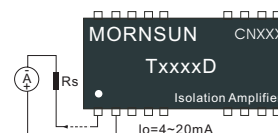


2.4 Output signal

Sout-, Iout+, Vout+ are signal output Pins. Sout- is the negative output of signal, Iout+ is the positive output of constant current signal, Vout+ is the positive output of voltage signal.

a: Current signal output

The solution is as below, the current output is from PIN Iout+. Usually, Iout+ can offer a constant current signal and the load capacity is less than 500Ω, that is if the load is less than 500Ω, the correspondent output is only depend on the input signal, not the load. This characteristic determines that current signal is suitable to long distance transmission. Only connect a sampling resistance with constant current loop at the remote terminal, the voltage of the sampling resistance is linear proportional to input signal.

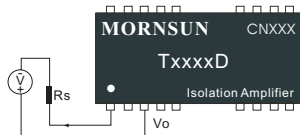




Isolation Amplifier Module Application Guidelines

b. Voltage signal output

The solution is as below, voltage signal is output from the Vout + pin directly. For the maximum output voltage, load capacity is greater than 1KΩ.

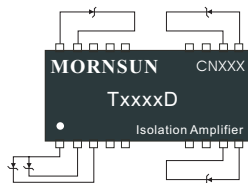


3. Extended applications

3.1 Protection of external port

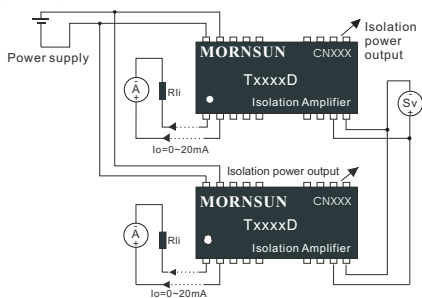
The solution is as below, on some occasions which have strong interference or high requirement on EMC, connecting a TVS can do some help on protection. If there is an instantaneous high-voltage & high-energy, TVS will clamp the voltage at once and form a loop to protect the equipment. After disappearance of the high-voltage & high-energy, TVS will go back to blocking state, and the equipment will work again. Please pay more attention on the below principles when choosing TVS.

- The protection voltage of TVS should be at least double the max operated voltage;
- The power of TVS should be higher than instantaneous power produced by the interference.



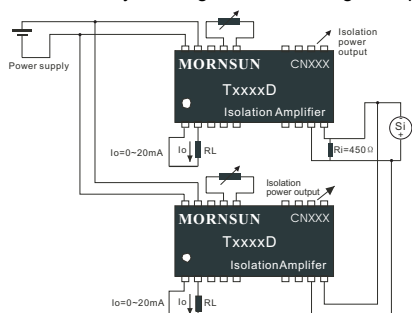
3.2 Single input & dual outputs of voltage signal source

The solution is as below, parallel connection can get dual isolated outputs signals. Multiple outputs can also be designed with the above principle.



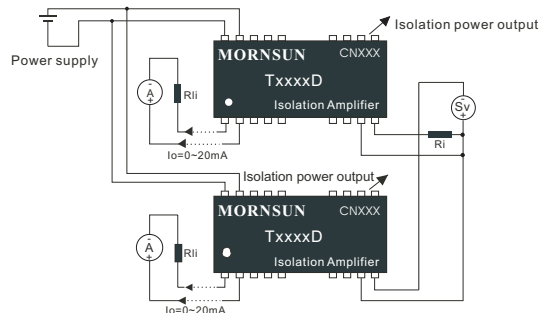
3.3 Single input & dual outputs current Signal

The solution as below is the typical application circuit, with standard current signal (0~20mA) input and dual voltage & current outputs. The principle is transforming the current signal into voltage signal by sampling resistance Ri, then paralleling the inputs & power supply. Multiple signal outputs application can also be available in the same way. The sampling resistance Ri will not be needed and the signal can be accessed directly if using the current signal input series.



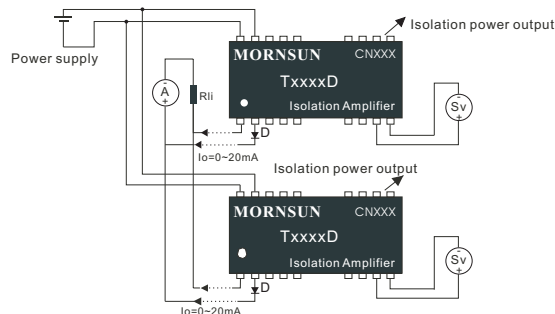
3.4 Single input & dual outputs two-wire transmitter signal source

The solution is as below, 1 unit power supply offer the power for two-wire translator and form a loop. Sampling resistance is connected to get sampling voltage, by sharing the power supply and sampling voltage, single input & dual outputs of two-wire transmitter signal source can be achieved. So does with one single input & multiple outputs.



3.5 Dual inputs & single output (adder/ subtractor)

The solution is as below, those 2 units share power supply and input signal source, and connect a diode at the signal output to prevent a loop between these two units. The load RL is shared by the 2 units, so the current of RL is the summation of those 2 units, which is called adder. If reverse the polar of one unit output current, then the current of RL is the difference of those 2 units, which called subtractor. So does with the multiple inputs and single output circuit.



4. Connection of two-wire, three-wire & four-wire device application

