KEYNES CONTROLS

NP-Count-2-SD-485 -Dual Port Digital Counter Card

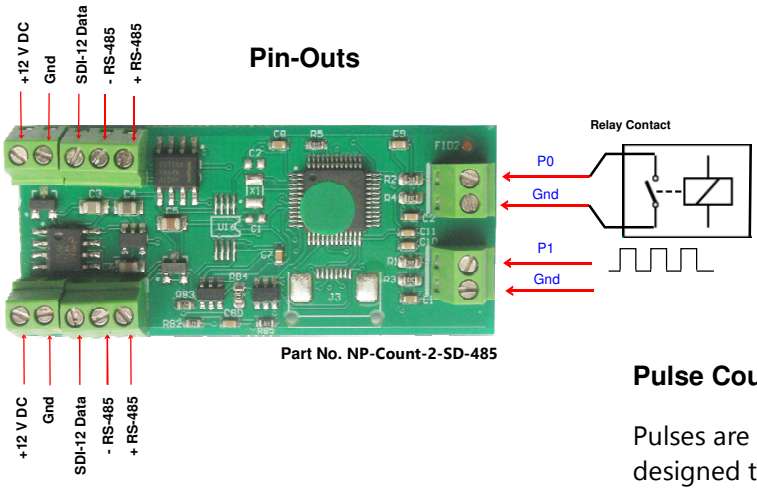
Built in SDI12 & RS-485 digital communications ports

OEM Customised Product

The NP-Count-2-SD-485 card is a dual channel pulse counter with built in SDI-12 and RS-485 digital communications. The card is intended to count pulses from relay contact closure. This card is fully integrated into the Keynes Controls Q-LOG free applications software and can be used with most third party manufactures data loggers and suitable network interfaces.

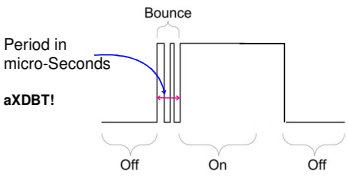
A programmable de-bounce feature enables the settling time for relay closures from the different manufactures devices to be used.

Pin-Outs



Description	
No. Channels	2
Comms Ports	1 x SDI-12 1 x RS485 Daisy chain connection between ports
Physical size (mm)	52 x 23
Power Supply	10 - 14 V DC @ 1.2 mA
Operating Temp	-20 to 70 Deg C
Connector Pitch	2.5 mm
Max Count Freq	1000 Hz
Counter size PO P1	 32 bit - 4 Billion max 32 bit - 4 Billion max

1 min @ 5 Counts/sec = 300
1 min @ 5 Counts/sec = 180



Network Operation

Connect the **NP-Count-2-SD-485** card to either of the SDI-12 or RS-485 digital networks.

On detecting data traffic on a network the **NP-Count-2-SD-485** card automatically assigns its own network operations to the active network.

If data is initially detected on the SDI-12 network then the **NP-Count-2-SD-485 card** assigns the SDI-12 network as the active network of choice.

Pulse Counter Operation

Pulses are counted when P0 or P1 are shorted to G. The device has been designed to operate only the contact closure of a relay.

There is a built 10K pull-up resistor on both inputs to limit the input level excitation signal. The card only

The counters return the value from the time they are powered on until the issuing of the measurement command. The **aM!** command is then used to reset the counters to zero for aD0! command so long as device is powered.

The **aD0!** command returns 2 values, 1 value for each counter. The value represents the current level of the counter.

Example.

Card with ID=3 has been active and has reached PO=1024 and P1=234 and is counting a rate of 5 counts/sec on PO and 3 counts/sec on input P1.

Command: 3M! takes measurement of current count.
3D0! returns 3 + **1024** + **234** – immediate values

The card remains powered on and a new measurement is made after a period of 1 minute.

Command: 3M! takes measurement of current count.
3D0! returns 3 + **300** + **180** - Difference from last reading.
3D1 returns 3 + **1324** + **414** - Cumulative count since device powered on.

where P0 = 1324 = Initial Count + count (over new measurement period)
1024 + 300

Example De-bounce Setting

The following example demonstrates how to configure the de-bounce feature of the NP-Count-2-SD-485 card.

Device with ID=3 to have de-bounce time of 600 micro-Seconds

Command: 3XDBT600!

Change Address

The following example demonstrates how to change the default ID from 0 to 4

Command: 0A4!

Supported Commands

The RS485 communications mode is identical to the SDI12 commands, except that, the break character is replaced by a percentage sign (%)

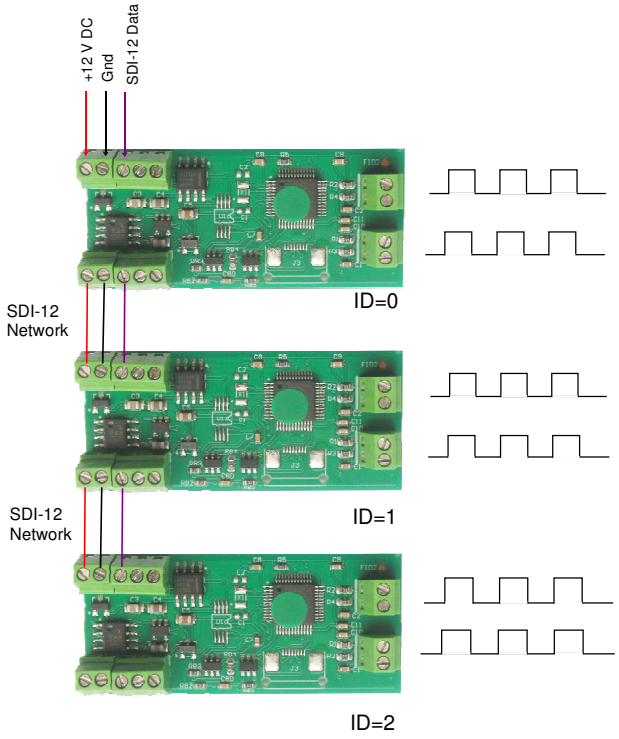
Command	Response / Example	Description
aM!	a0tt2	2 values available immediately The measurement command reset the counter offset so that the next set of data commands responds with th
aD0!	a+p0+p1 e.g. 0D0! → 0+3.0+4.0	Pulse count values from previous measurement to latest
aD1!	a+q0+q1 e.g. 0+33.0+34.0	Running pulse count value from time of power-up
aI!	a13KEYNESCOPULCTR001	Identification string - version number
aV!	a	Verification (no action taken at present)
aAb	b e.g. 0A1 → 1	Standard change address command
	Extended Commands	
aXDBT! **aXDBTn!**	0n e.g. 0XDBT! → 05	Read or write the de-bounce (n) time in microseconds The default is 500 us

Multiple NP-Count-2-SD-485 Cards on the SDI-12 network.

The image below demonstrates how multiple NP-Count-2-SD-485 cards are connected together on an SDI-12 network.

Cards are simply daisy chained from one card to the next.

Make sure each card has a unique ID number,

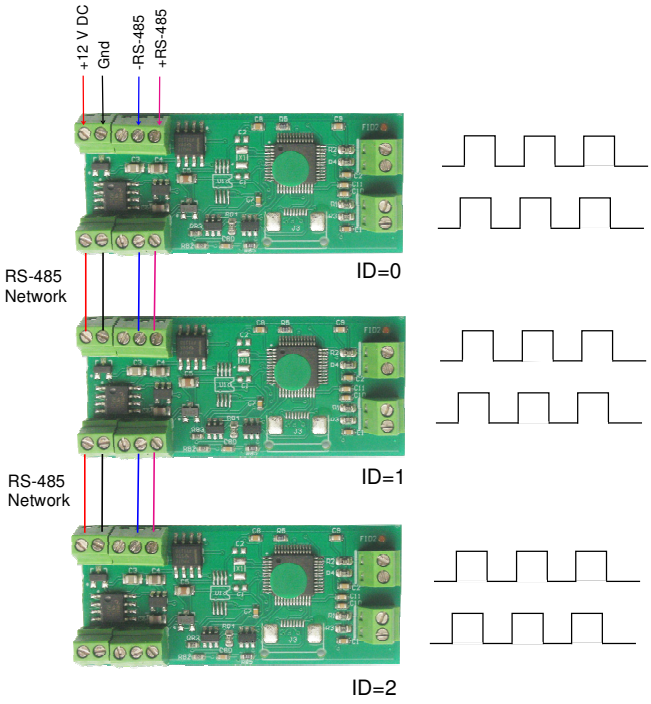


Multiple NP-Count-2-SD-485 Cards on the RS-485 network.

The image below demonstrates how multiple NP-Count-2-SD-485 cards are connected together on an RS-485 network.

Cards are simply daisy chained from one card to the next.

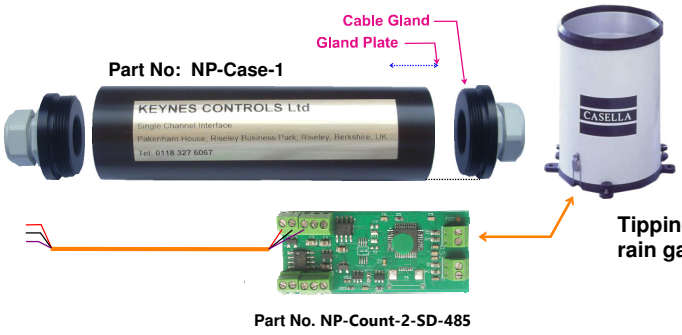
Make sure each card has a unique ID number,



Typical Application - Rain Level

The image opposite demonstrates how the NP-Count-2-SD-485 card is used to convert a typical tipping bucket range into an intelligent device suitable for direct connect to a PC or data logger unit.

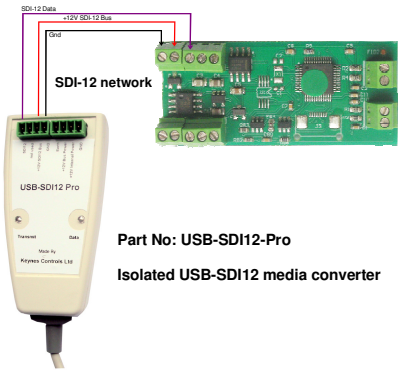
The counter output is read directly from the card and converted into engineering units directly using the Q-LOG software or using formulae options within a data logger. The counter can be reset under software commands.



Connecting the NP-Count-2-SD-485 to a Windows PC

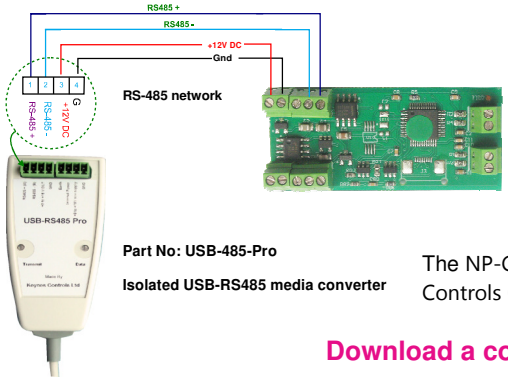
The NP-Count-2-SD-485 card can be connected directly to a Windows PC using a Keynes Controls USB media converter. These devices isolate the PC from the chosen network and powers the cards directly from the PC USB port. No external power supply is required.

The **NP-Count-2-SD-485** card can be used with any other manufactures suitable media converter.



Part No: USB-SDI12-Pro

Isolated USB-SDI12 media converter



Part No: USB-485-Pro

Isolated USB-RS485 media converter

Q-LOG Application

The NP-Count-2-SD-485 is fully integrated into the Keynes Controls Q-LOG free data acquisition and display software.

Download a copy of Q-Log

Further information at:

http://www.aquabat.net/QLOGFree/qlogv2.html

This device appears as Keynes Controls Pulse Counter within the Q-LOG applications software.