

Typical application

- PCBAs production lines
- ATE-controlled ISP programming
- Hi-number of paneled PCBAs requiring ISP-Programming

General characteristics

- Part of Manta Systems' acclaimed NanoPlex Series of Relay Demultiplexers
- Ultra-small size, only 51.0- x 66.5-mm
- Designed for piggyback mounting, takes easily place in your Test Fixture
- NanoPlex is universal and compatible with all types of ISP-Programming tools

Benefits

- Very simple implementation of ISP programming to panels of PCBAs.
- Multiply the number of your ISP-Programmer channels for sequential device programming.
- Provides galvanic isolation of your ISP programmer to target boards.
- Ready to use Relays Demultiplexers save days/weeks of your workmanship when creating home-made systems.
- Higher reliability, no need to wait long time in case of system fault.

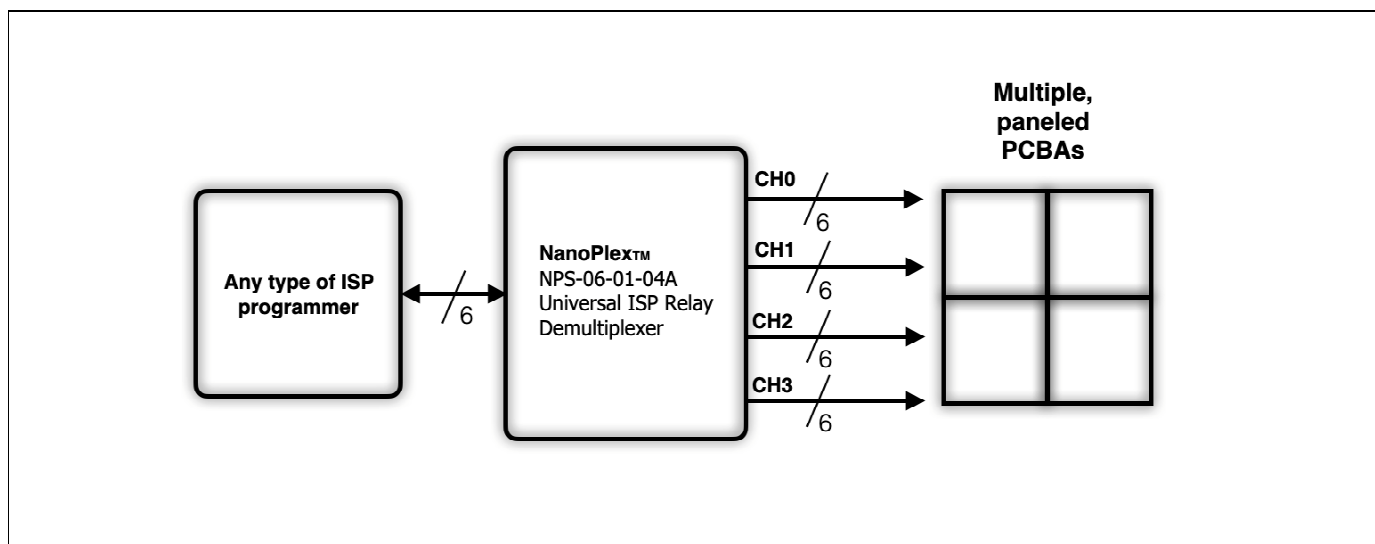
General description

NPS-06-01-04A Universal ISP Relay Demultiplexer allows you to multiply the number of channels of your ISP-Programmer by a factor of four with a galvanic isolation.

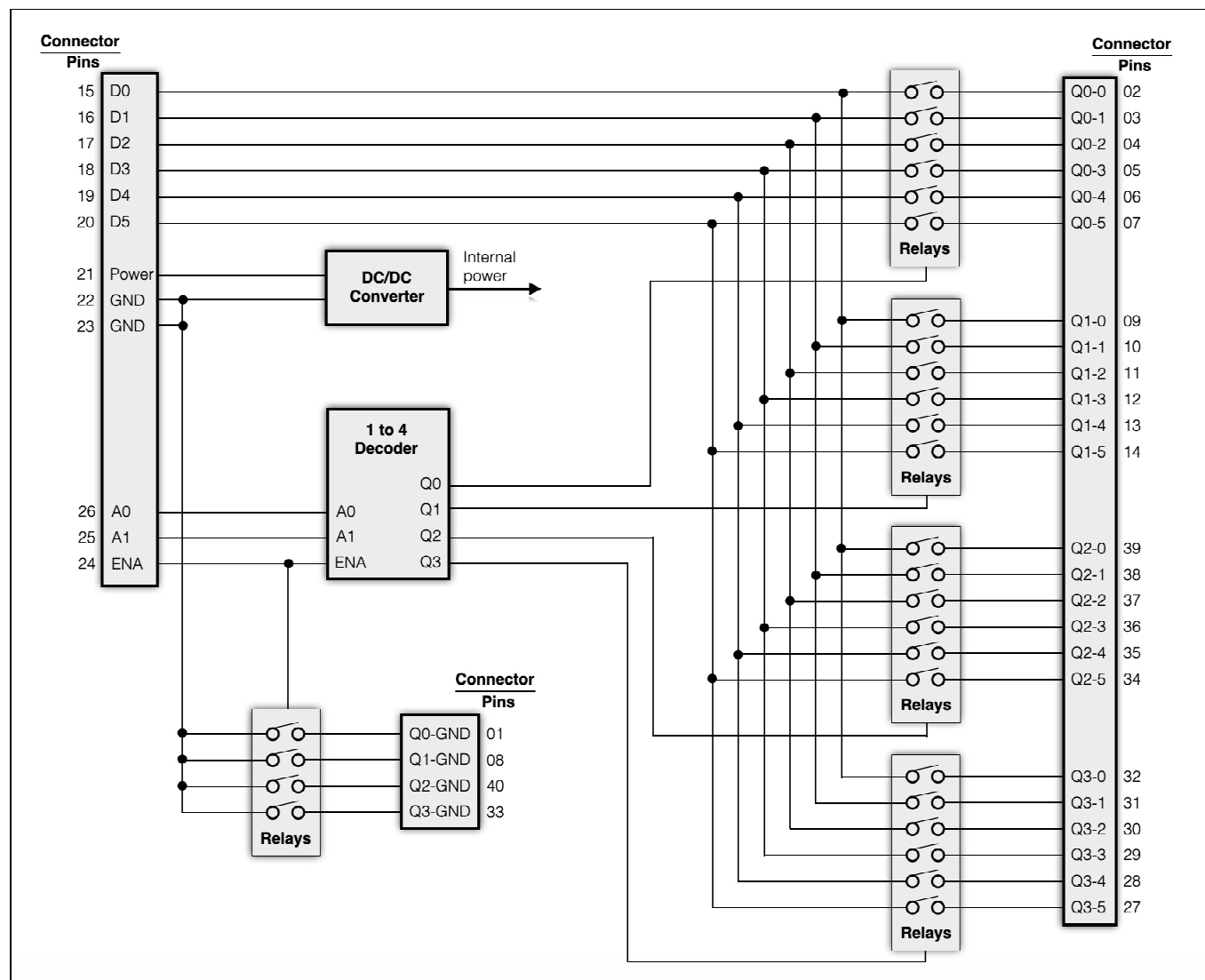
The number of signals of any relays-switched-channel is six. You can address one of the four channels by using A1, A0 input control signals.

ENA is also present and allows you to un-connect all relays-switched channels from you target PCBA.

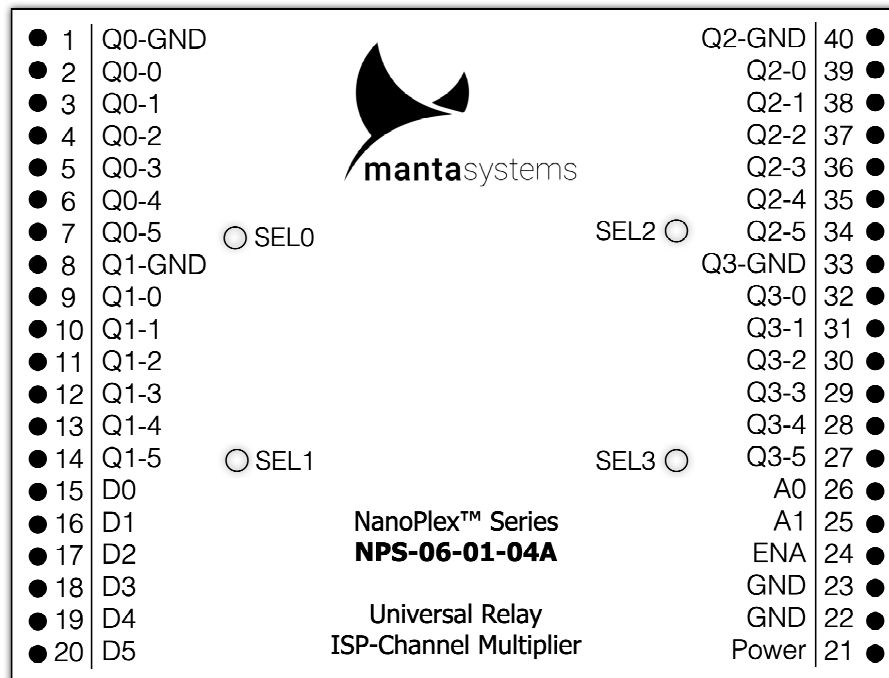
Typical application diagram



Block Diagram



Layout (top view)



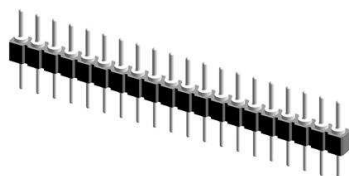
Connection type

NPS-06-01-04A is provided of a dual PRECI-DIP 350-10-120-00-001101 (Digi-Key P/N: 1212-1137-ND), 20-pin male strip placed at the borders of the PCB. Connector pins have a diameter of 0.47mm.

Female strips included on NanoPlex package are PRECI-DIP 323-87-120-41-001101 (Digi-Key P/N: 1212-1134-ND) and allow the connection in WireWrap, typical Test-Fixture stile.

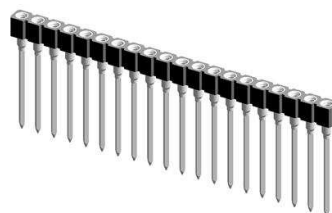
PRECI-DIP 350-10-120-00-001101
(Digi-Key P/N: 1212-1137-ND)
Male Headers

(Mounted on NanoPlex board)



PRECI-DIP 323-87-120-41-001101
(Digi-Key P/N: 1212-1134-ND)
Female Receptacles

(Used to WireWrap connect NanoPlex
to programming/test fixtures)



Connector pinout, top view

Pin	Signal	Signal	Pin
01	Q0-GND	Q2-GND	40
02	Q0-0	Q2-0	39
03	Q0-1	Q2-1	38
04	Q0-2	Q2-2	37
05	Q0-3	Q2-3	36
06	Q0-4	Q2-4	35
07	Q0-5	Q2-5	34
08	Q1-GND	Q3-GND	33
09	Q1-0	Q3-0	32
10	Q1-1	Q3-1	31
11	Q1-2	Q3-2	30
12	Q1-3	Q3-3	29
13	Q1-4	Q3-4	28
14	Q1-5	Q3-5	27
15	D0	A0	26
16	D1	A1	25
17	D2	ENA	24
18	D3	GND	23
19	D4	GND	22
20	D5	Power	21

Channel addressing truth table

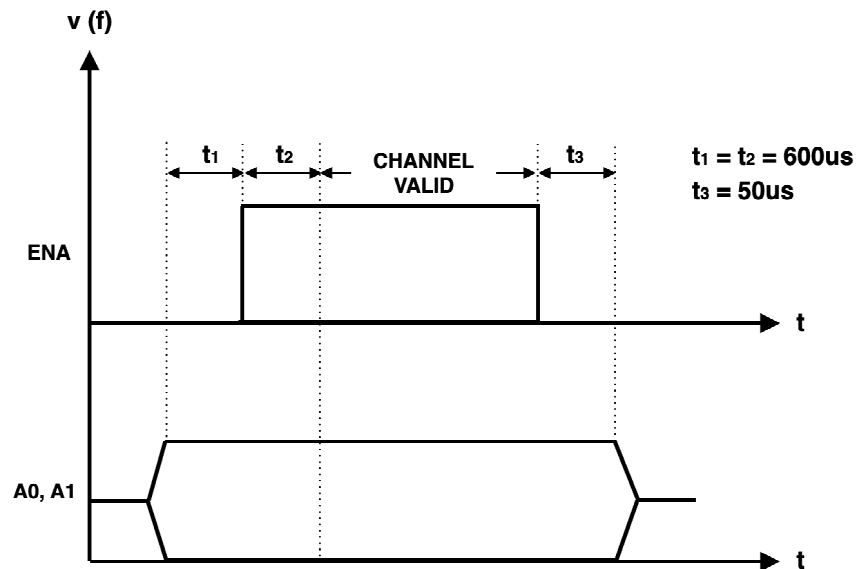
ENA	A1	A0	Active connections					
1	0	0	D0►Q0.0	D1►Q0.1	D2►Q0.2	D3►Q0.3	D4►Q0.4	D5►Q0.5
1	0	1	D0►Q1.0	D1►Q1.1	D2►Q1.2	D3►Q1.3	D4►Q1.4	D5►Q1.5
1	1	0	D0►Q2.0	D1►Q2.1	D2►Q2.2	D3►Q2.3	D4►Q2.4	D5►Q2.5
1	1	1	D0►Q3.0	D1►Q3.1	D2►Q3.2	D3►Q3.3	D4►Q3.4	D5►Q3.5
0	X	X	No relays bank is selected. HiZ.					

General characteristics

Item	Value	Units
Supply Voltage	5 to 24.5	V
Power Consumption	1.9	W
A0, A1, ENA digital inputs	Active high inputs with 8.5K min pull-down resistance	
A0, A1, ENA digital inputs ViH	3 to 28	V
A0, A1, ENA digital inputs ViL	0 to 0.75	V
A0, A1, ENA digital inputs Setup Time, max	600	uS
A0, A1, ENA digital inputs Release Time, max	50	uS
Size	51.0 x 66.5	mm
Weight	20	g
Operating Temperature	-10 to +70	°C

Relay characteristics

Contact Data	Conditions	Min	Typ	Max	Units
Number of operations	10V/100mA 10V/4mA <5V/10mA		10,000,000 40,000,000 400,000,000		No.
Contact-rating	any DC combination of V&A, not to exceed their individual max, 's			10	W
Switching voltage	DC or peak AC			170	V
Switching current	DC or peak AC			0.5	A
Carry current	DC or peak AC			1	A
Contact resistance static	measured with 40% overdrive, start value			200	mOhm
Insulation resistance	RH <45%, 100V test voltage	100			GOhm
Breakdown voltage	according to EN60255-5	210			VDC
Operating time incl. bounce	measured with 40% overdrive		0.6		ms
Release time	measured with no coil excitation		0.05		ms
Capacitance	@10KHz above open switch			0.5	pF
Contact material	Rhodium				



Set-up instructions

NPS-06-01-04A easily accommodates on your Test Systems (ATE) or Test Fixture. The product connector is a dual PRECI-DIP 350-10-120-00-001101 (Digi-Key P/N: 1212-1137-ND), 20-pin male strip placed at the borders of the PCB. Connector pins have a diameter of 0.47mm.

For an easy substitution of NanoPlex product, we strongly recommend not to solder connector pins to ATE/Test Fixture directly. Instead, the two 20-pin female strips included as accessories on product package or any other equivalent female strip should be used. Female strips included on NanoPlex package are PRECI-DIP 323-87-120-41-001101 (Digi-Key P/N: 1212-1134-ND) and allow the connection in WireWrap, typical Test-Fixture-style.

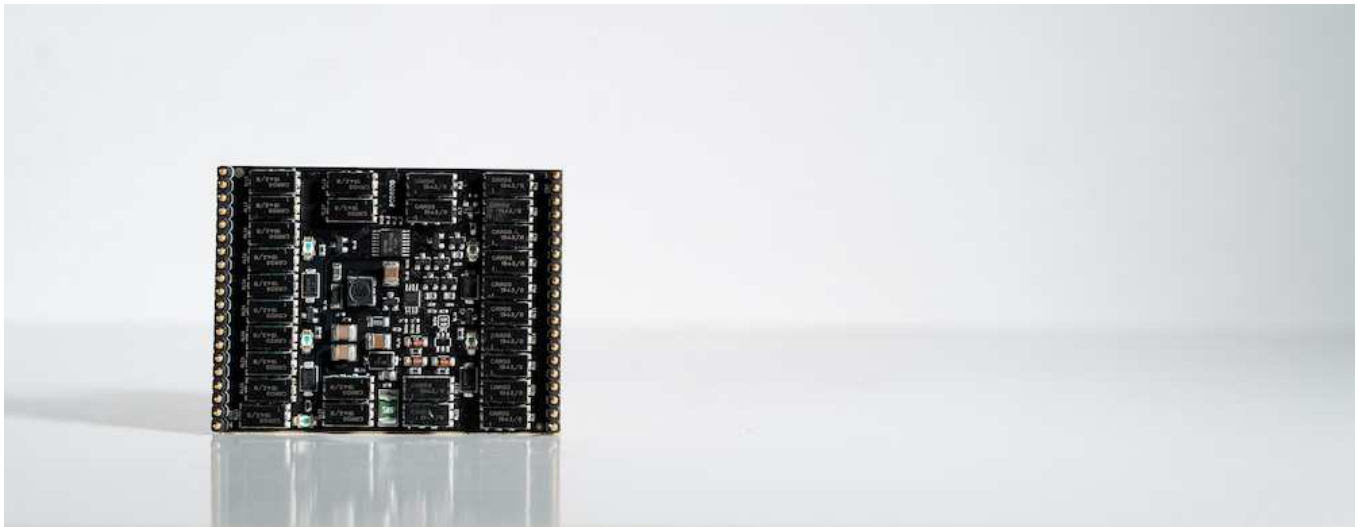
Alternatively, solder ATE/Test Fixture cables and trim long WireWrap pins. However, if WireWrap connection system is chosen, we suggest to use the Jonard Tools WSU-30 pen (Digi-Key P/N: K104-ND) which is suitable for WireWrap AWG 30 wires.

Connect NanoPlex to a power source, with voltage range recommended on General Characteristics section. Power is pin 21 and ground is at pins 22 and 23. Make sure to connect the ground of your ATE/Test System to these pins.

Connect up to six signals from the ISP-Programmer (could be JTAG, SPI, I2C, SGI, SWG, UART, USART, OneWire™, etc.) to the NanoPlex connector, pins 15 to 20. These signals will be directed to the output channels. Channel selection is on A0, A1 (pins 26 and 25, respectively) and NanoPlex enable on ENA (pin 24).

Connect NanoPlex relays contacts Q0.xx, Q1.xx, Q2.xx, Q3.xx to the target PCBAs. Qn.00 corresponds to D0, Qn.01 with D1, and so on.

NanoPlex is now ready to be power supplied. Green LED turns on, and one of the four channel-selection yellow LEDs reflect the status of ENA, A0, A1 input signals. Channel selection and NanoPlex enable are driven by ATE/Test System, etc. ViH and ViL of these input signals are described on data-sheet General Characteristics section.



About Manta Systems

Manta Systems is a high-tech company, global leader in high-density signal switching for In-System Programming (ISP) and Testing Systems. The company targets the electronic boards assembly market, where a high number of connections is required. Manta Systems flagship product is NanoPlex™, a series of Channels Multipliers for In-System Programming (ISP) and Testing instruments. NanoPlex is the **world's first universal tool** providing end-user with the possibility of having compact, easy-to-use, professional, reliable In-System Programming (ISP) and Testing Channel Multiplication functionality.

Warranty

All Manta Systems products are covered by a **three-year warranty** against defects and workmanship from the purchase date. The warranty only covers products when properly installed and used.

Orders

All NanoPlex™ Series products are generally **off-the-shelf**.

Shipping is within **24 hours** from order reception.

Free shipping & 30-day money back guarantee.

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