

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.

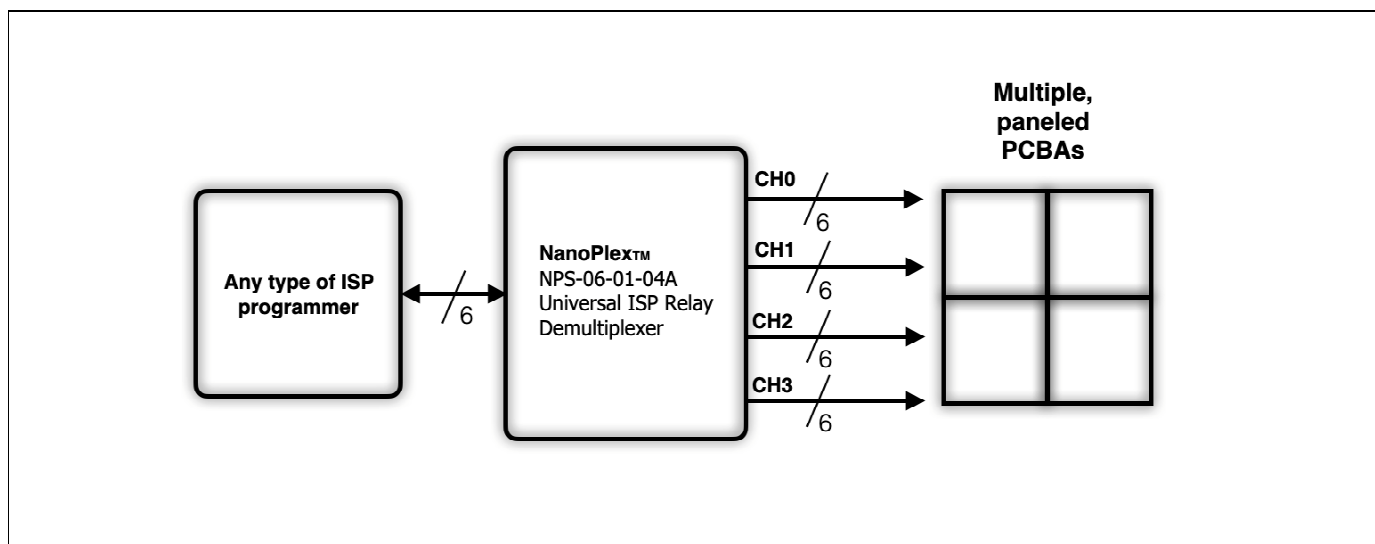
General description

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.

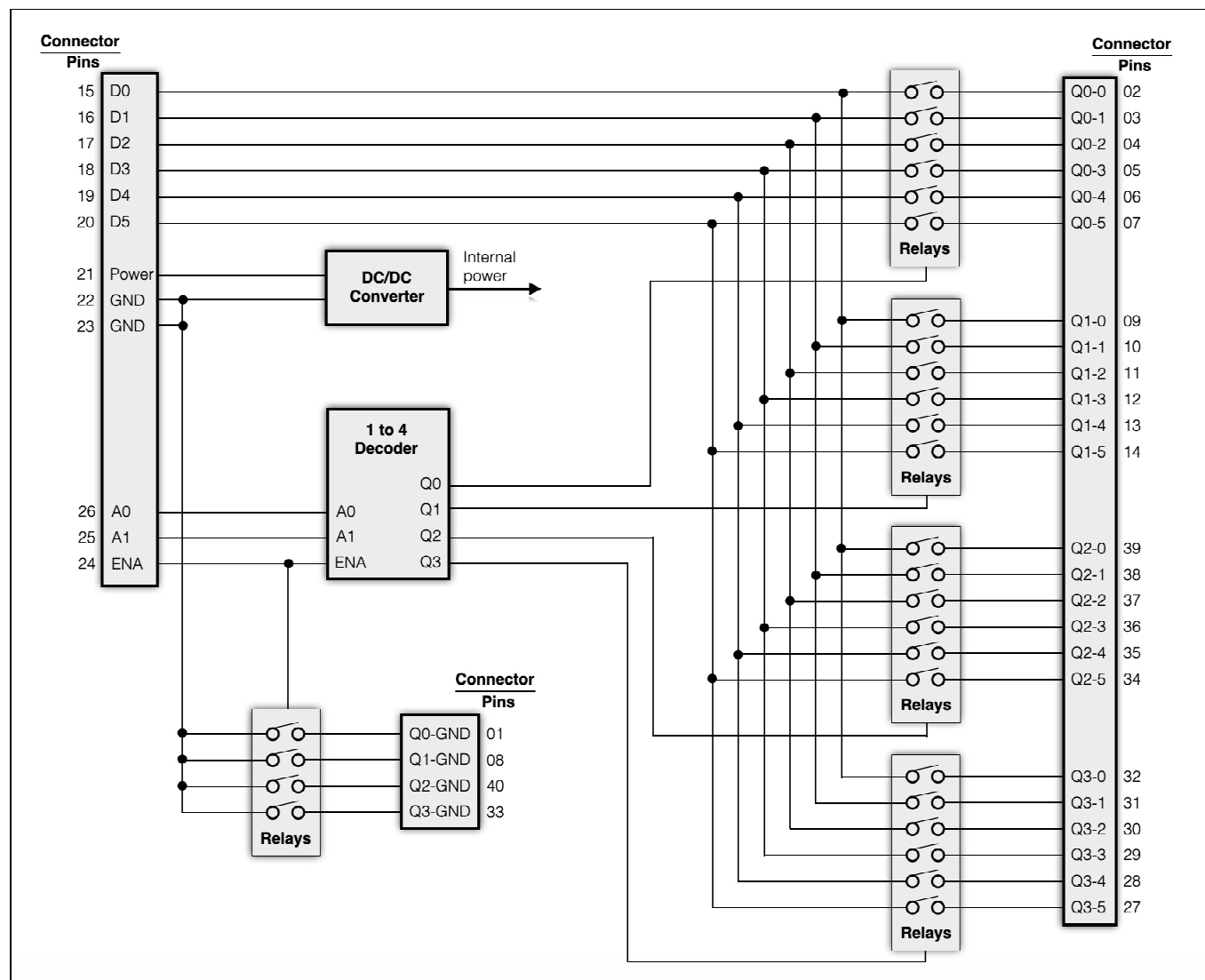
The number of signals of any relays-switched-channel is six. You can address one of the four channels by using A1, A0 input control signals.

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

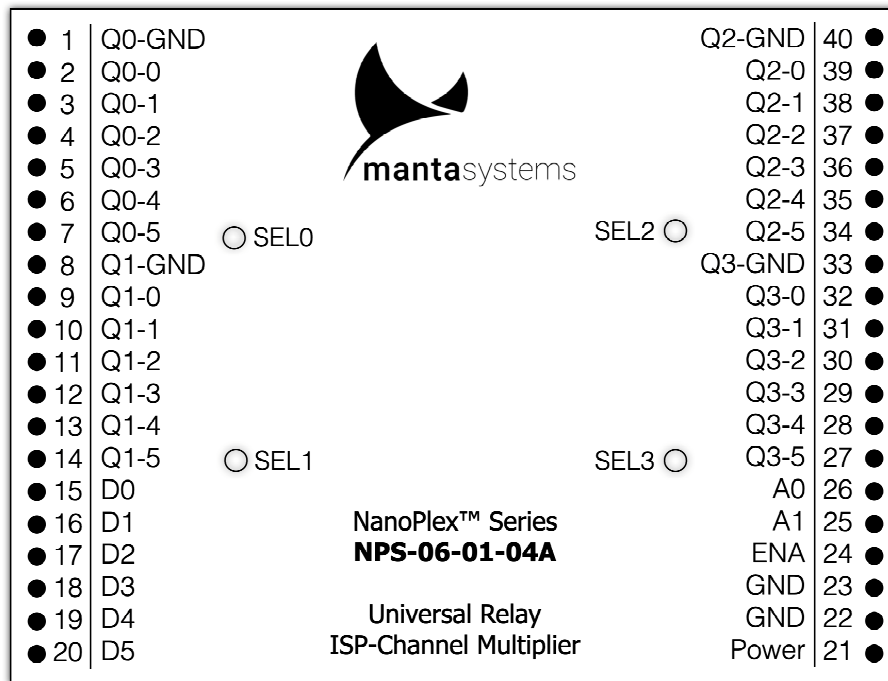
Typical application diagram



Block Diagram



Layout (top view)



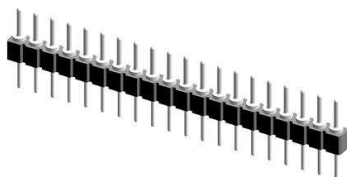
Connection type

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.

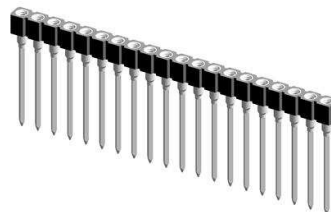
PRECI-DIP 350-10-120-00-001101
(Digi-Key P/N: 1212-1137-ND)
Male Headers

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

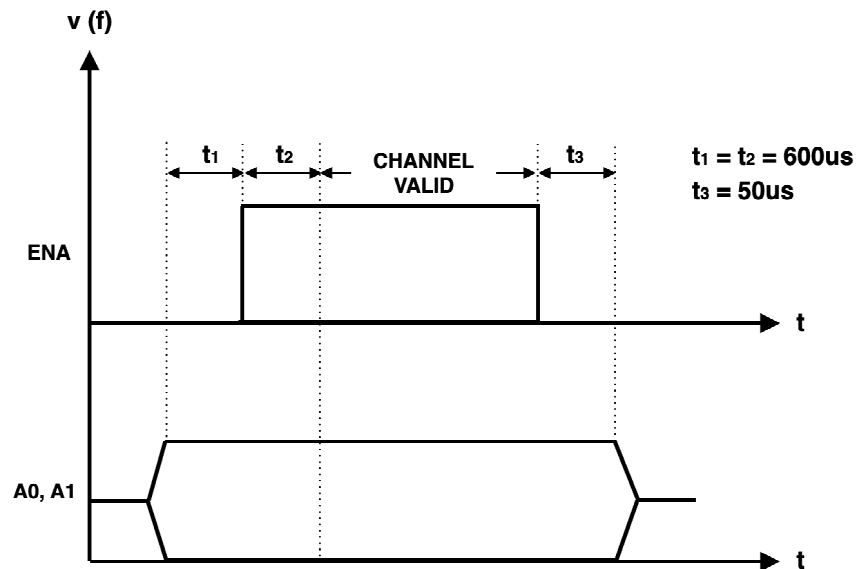
| ENA | A1 | A0 | Active connections | | | | | |
|-----|----|----|----------------------------------|---------|---------|---------|---------|---------|
| 1 | 0 | 0 | D0►Q0.0 | D1►Q0.1 | D2►Q0.2 | D3►Q0.3 | D4►Q0.4 | D5►Q0.5 |
| 1 | 0 | 1 | D0►Q1.0 | D1►Q1.1 | D2►Q1.2 | D3►Q1.3 | D4►Q1.4 | D5►Q1.5 |
| 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-stile.

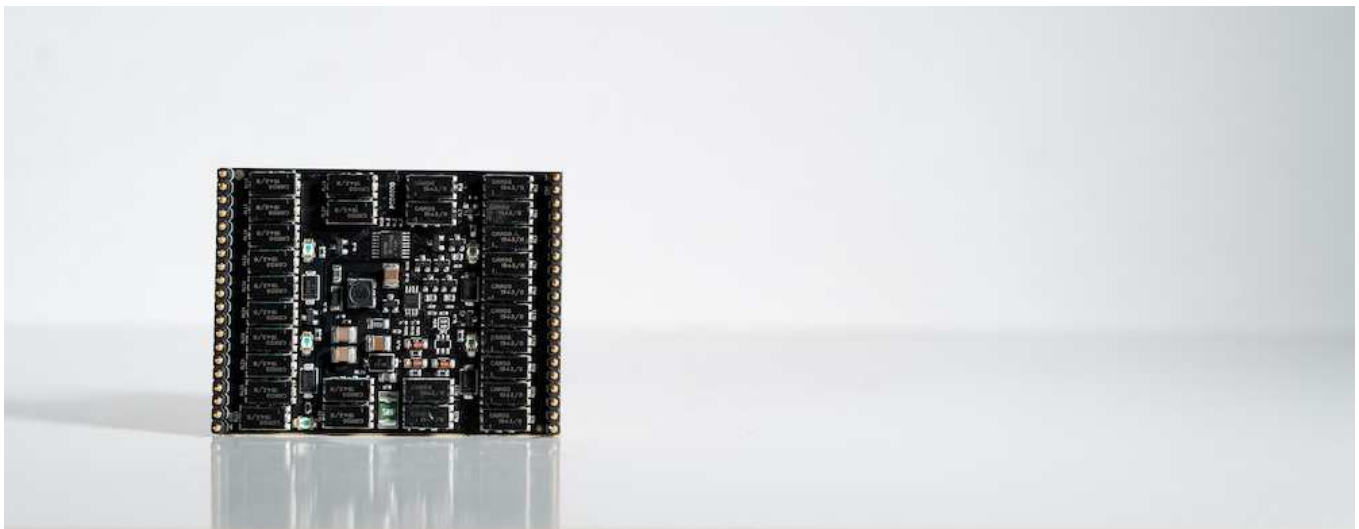
Alternatively, solder ATE/Test Fixture cables and trim long WireWrap pins. However, if WireWrap connection system is chosen, we suggest to use the Jonard Tools WSU-30 pen (Digi-Key P/N: K104-ND) which is suitable for WireWrap AWG 30 wires.

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 hi-tech company, global leader in hi-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.

Orders

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

Shipping within 24 hours from order reception.

Free shipping & 30-day money back guarantee.

Important

Manta Systems is the owner of NanoPlex™ tradename. Manta Systems reserves the right to make improvements to NanoPlex™ Series and its documentation without notice. Information in this document is intended to be accurate and reliable. However, Manta Systems assumes no responsibility for its use; nor for any infringements of rights of third parties which may result from its use.

MANTA SYSTEMS WILL NOT BE LIABLE FOR DAMAGES RESULTING FROM LOSS OF DATA, PROFITS, USE OF PRODUCTS, OR INCIDENTAL OR CONSEQUENTIAL DAMAGES, EVEN IF ADVISED OF THE POSSIBILITY THEREOF.

**For more information, please visit: www.mantasys.com
or write us at: info@mantasys.com**

