



Microchip (Atmel) AVR (SPI) Mass ISP Programming

Application Note

DC04021

NanoPlex™ general description

NanoPlex NPS-06-01-04A Universal Relay ISP-Channel Multiplier allows the expansion of the number of channels of ISP-Programming tools, while also offering galvanic isolation. The total number of switched signals is 28. NanoPlex is used on PCBAs production lines, in ATE-controlled ISP programming. Thanks to its ultra-small size (only 51.0- x 66.5-mm), this NanoPlex model takes easily place in Test Fixtures. Designed for piggyback mounting, NanoPlex is universal and compatible with all types of ISP Programming tools.

Recommended Readings - Further Documentation

Before starting, please study the following essential papers:

- *NanoPlex NPS-06-01-04A Data Sheet*
- *NanoPlex NPS-06-01-04A Flexibility Application Note*

'*NanoPlex NPS-06-01-04A Flexibility Application Note*' clearly describes NanoPlex **modularity** and how to deploy **multiple units** in order to create high-density ISP Programming Multipliers with an **unlimited number of channels**.

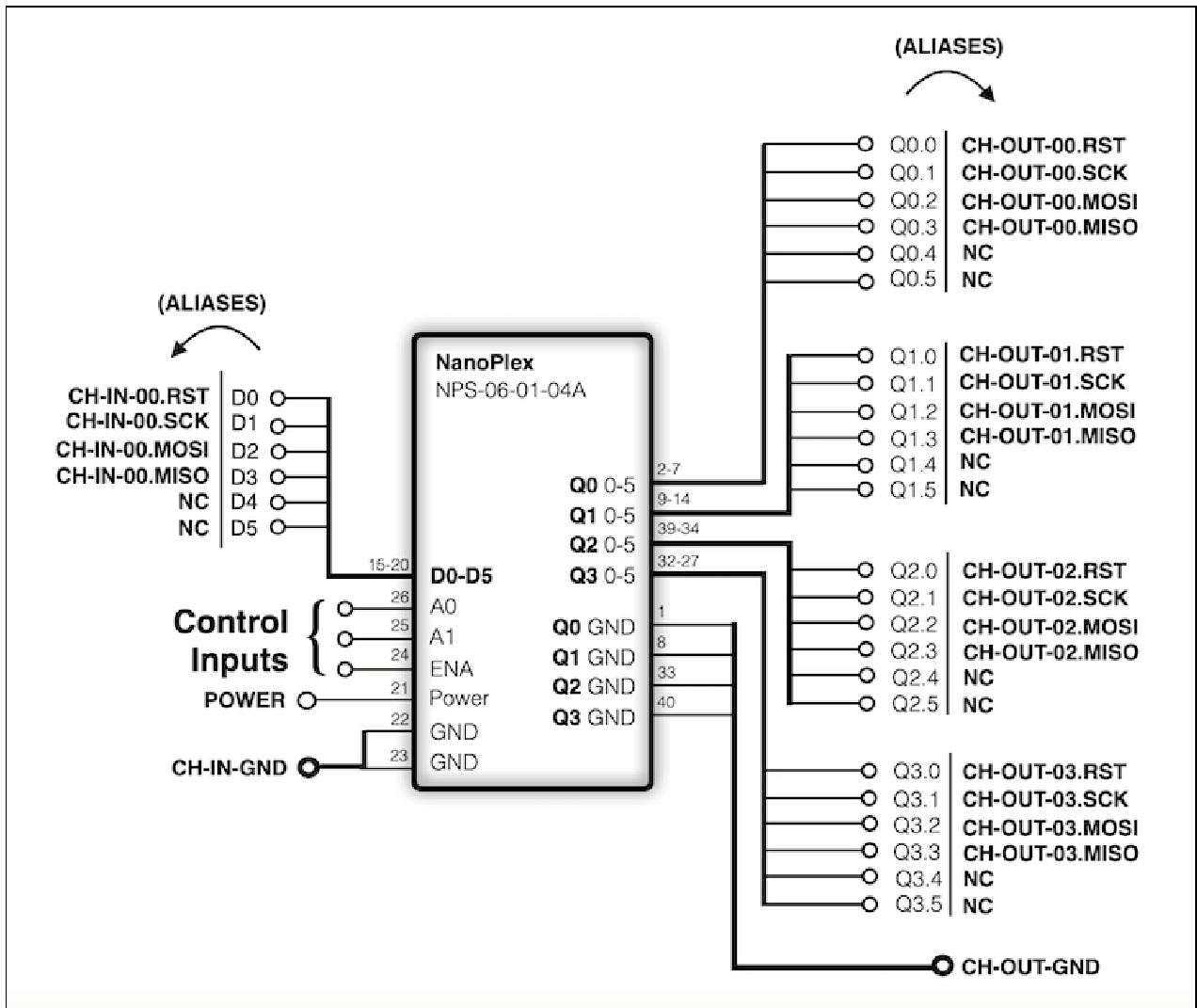
Microchip (Atmel) AVR (SPI)

Signals required for ISP Programming are:

- RST
- SCK
- MOSI
- MISO

The most convenient way to ISP program multiple instances of this device through NanoPlex is using this model in **1x4 operating mode**. 1 NanoPlex input channel is multiplied to 4 separated, galvanic isolated output channels.

On the following mode examples diagram, NanoPlex signal names are assigned with aliases (texts are in **bold**).



Truth table

(the symbol ► stands for “connected to”)

ENA	A1	A0	CH-IN-	00.RST	00.SCK	00.MOSI	00.MISO
				►	►	►	►
1	0	0	CH-OUT-	00.RST	00.SCK	00.MOSI	01.MISO
1	0	1	CH-OUT-	01.RST	01.SCK	01.MOSI	01.MISO
1	1	0	CH-OUT-	02.RST	02.SCK	02.MOSI	02.MISO
1	1	1	CH-OUT-	03.RST	03.SCK	03.MOSI	03.MISO
0	X	X	CH-OUT	HI-Z	HI-Z	HI-Z	HI-Z

Operating sequence

ENA = 1

A1-A0 = "00"

CH-IN-00.RST ▶ CH-OUT-00.RST
CH-IN-00.SCK ▶ CH-OUT-00.SCK
CH-IN-00.MOSI ▶ CH-OUT-00.MOSI
CH-IN-00.MISO ▶ CH-OUT-00.MISO

A1-A0 = "01"

CH-IN-00.RST ▶ CH-OUT-01.RST
CH-IN-00.SCK ▶ CH-OUT-01.SCK
CH-IN-00.MOSI ▶ CH-OUT-01.MOSI
CH-IN-00.MISO ▶ CH-OUT-01.MISO

A1-A0 = "10"

CH-IN-00.RST ▶ CH-OUT-02.RST
CH-IN-00.SCK ▶ CH-OUT-02.SCK
CH-IN-00.MOSI ▶ CH-OUT-02.MOSI
CH-IN-00.MISO ▶ CH-OUT-02.MISO

A1-A0 = "11"

CH-IN-00.RST ▶ CH-OUT-03.RST
CH-IN-00.SCK ▶ CH-OUT-03.SCK
CH-IN-00.MOSI ▶ CH-OUT-03.MOSI
CH-IN-00.MISO ▶ CH-OUT-03.MISO

Connector pinout (aliases signals, top view)

Pin	Signal
01	CH-OUT-GND
02	CH-OUT-00.RST
03	CH-OUT-00.SCK
04	CH-OUT-00.MOSI
05	CH-OUT-00.MISO
06	NC
07	NC
08	CH-OUT-GND
09	CH-OUT-01.RST
10	CH-OUT-01.SCK
11	CH-OUT-01.MOSI
12	CH-OUT-01.MISO
13	NC
14	NC
15	CH-IN-00.SRST
16	CH-IN-00.SCK
17	CH-IN-00.MOSI
18	CH-IN-00.MISO
19	NC
20	NC

Signal	Pin
CH-OUT-GND	40
CH-OUT-02.RST	39
CH-OUT-02.SCK	38
CH-OUT-02.MOSI	37
CH-OUT-02.MISO	36
NC	35
NC	34
CH-OUT-GND	33
CH-OUT-03.RST	32
CH-OUT-03.SCK	31
CH-OUT-03.MOSI	30
CH-OUT-03.MISO	29
NC	28
NC	27
A0	26
A1	25
ENA	24
GND (*)	23
GND (*)	22
Power	21

(*) GND at pins 22/23 is used for both Power GND and CH-IN-GND.

Using multiple NanoPlex NPS-06-01-04A units

NanoPlex NPS-06-01-04A product is modular by design. Several units can be deployed in order to set-up a very large, limitless channel-multiplier. The advantage of using more units is a faster and less expensive substitution.

Please read '[NanoPlex NPS-06-01-04A Flexibility Application Note](#)' to discover how to set-up a switching system with the **number of channels as high as your application requires**.

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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