



Microchip HCSXXX (2-Wire) Mass ISP Programming

Application Note

DC04044

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**.

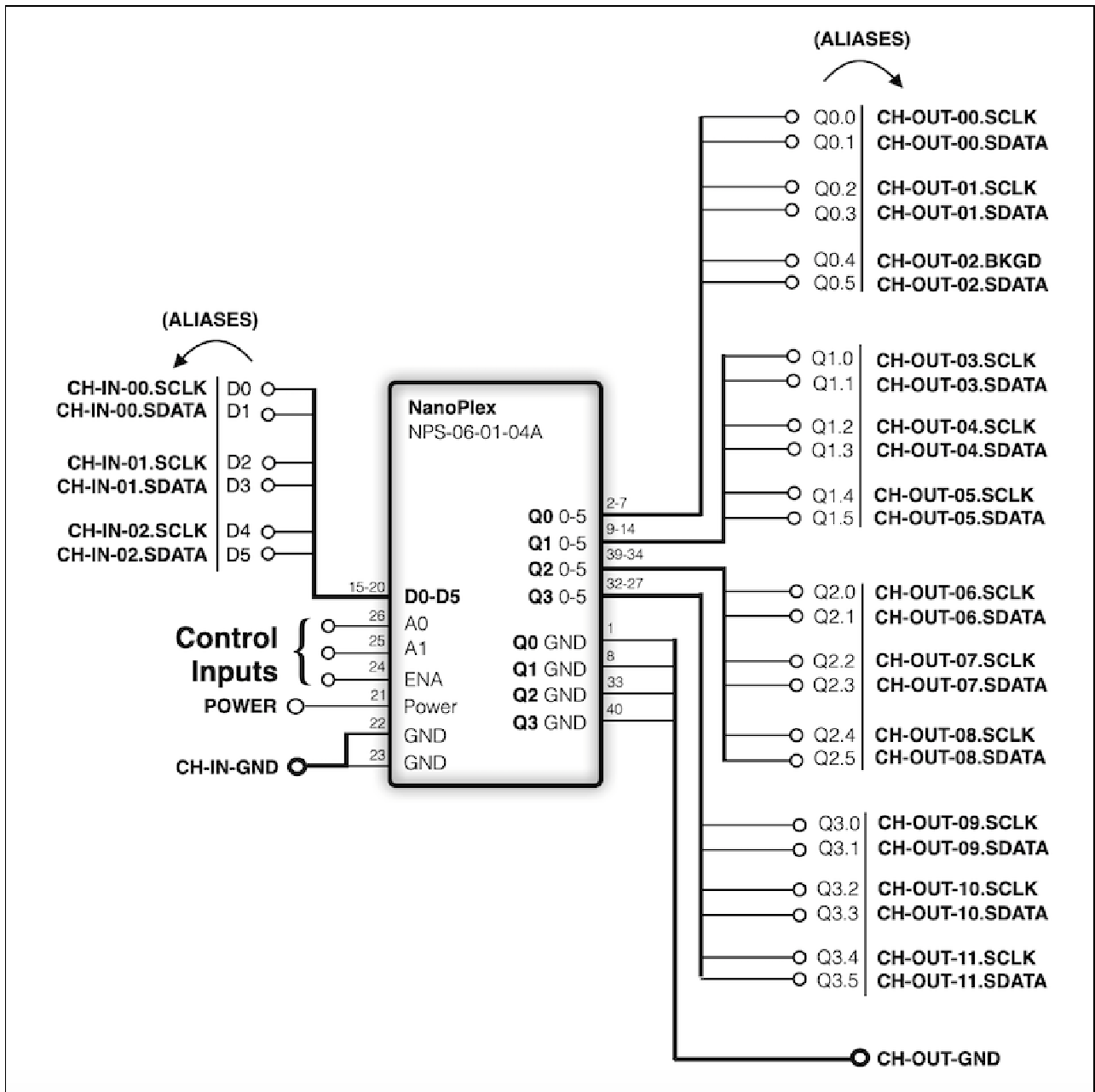
Microchip HCSXXX (2-Wire)

Signals required for ISP Programming are:

- SCLK
- SDATA

The most convenient way to ISP program multiple instances of this device through NanoPlex is using this model in **3x12 operating mode**. 3 NanoPlex input channels are multiplied to 12 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.SCLK ►	00.SDATA ►	01.SCLK ►	01.SDATA ►	02.SCLK ►	02.SDATA ►
1	0	0	CH-OUT-	00.SCLK	00.SDATA	01.SCLK	01.SDATA	02.SCLK	02.SDATA
1	0	1	CH-OUT-	03.SCLK	03.SDATA	04.SCLK	04.SDATA	05.SCLK	05.SDATA
1	1	0	CH-OUT-	06.SCLK	06.SDATA	07.SCLK	07.SDATA	08.SCLK	08.SDATA
1	1	1	CH-OUT-	09.SCLK	09.SDATA	10.SCLK	10.SDATA	11.SCLK	11.SDATA
0	X	X	CH-OUT-	HI-Z	HI-Z	HI-Z	HI-Z	HI-Z	HI-Z

Operating sequence

ENA = 1

A1-A0 = "00"

CH-IN-00.SCLK ► CH-OUT-00.SCLK
CH-IN-00.SDATA ► CH-OUT-00.SDATA

CH-IN-01.SCLK ► CH-OUT-01.SCLK
CH-IN-01.SDATA ► CH-OUT-01.SDATA

CH-IN-02.SCLK ► CH-OUT-02.SCLK
CH-IN-02.SDATA ► CH-OUT-02.SDATA

A1-A0 = "01"

CH-IN-00.SCLK ► CH-OUT-03.SCLK
CH-IN-00.SDATA ► CH-OUT-03.SDATA

CH-IN-01.SCLK ► CH-OUT-04.SCLK
CH-IN-01.SDATA ► CH-OUT-04.SDATA

CH-IN-02.SCLK ► CH-OUT-05.SCLK
CH-IN-02.SDATA ► CH-OUT-05.SDATA

A1-A0 = "10"

CH-IN-00.SCLK ► CH-OUT-06.SCLK
CH-IN-00.SDATA ► CH-OUT-06.SDATA

CH-IN-01.SCLK ► CH-OUT-07.SCLK
CH-IN-01.SDATA ► CH-OUT-07.SDATA

CH-IN-02.SCLK ► CH-OUT-08.SCLK
CH-IN-02.SDATA ► CH-OUT-08.SDATA

A1-A0 = "11"

CH-IN-00.SCLK ► CH-OUT-09.SCLK
CH-IN-00.SDATA ► CH-OUT-09.SDATA

CH-IN-01.SCLK ► CH-OUT-10.SCLK
CH-IN-01.SDATA ► CH-OUT-10.SDATA

CH-IN-02.SCLK ► CH-OUT-11.SCLK
CH-IN-02.SDATA ► CH-OUT-11.SDATA

Connector pinout (aliases signals, top view)

Pin	Signal
01	CH-OUT-GND
02	CH-OUT-00.SCLK
03	CH-OUT-00.SDATA
04	CH-OUT-01.SCLK
05	CH-OUT-01.SDATA
06	CH-OUT-02.SCLK
07	CH-OUT-02.SDATA
08	CH-OUT-GND
09	CH-OUT-03.SCLK
10	CH-OUT-03.SDATA
11	CH-OUT-04.SCLK
12	CH-OUT-04.SDATA
13	CH-OUT-05.SCLK
14	CH-OUT-05.SDATA
15	CH-IN-00.SCLK
16	CH-IN-00.SDATA
17	CH-IN-01.SCLK
18	CH-IN-01.SDATA
19	CH-IN-02.SCLK
20	CH-IN-02.SDATA

Signal	Pin
CH-OUT-GND	40
CH-OUT-06.SCLK	39
CH-OUT-06.SDATA	38
CH-OUT-07.SCLK	37
CH-OUT-07.SDATA	36
CH-OUT-08.SCLK	35
CH-OUT-08.SDATA	34
CH-OUT-GND	33
CH-OUT-09.SCLK	32
CH-OUT-09.SDATA	31
CH-OUT-10.SCLK	30
CH-OUT-10.SDATA	29
CH-OUT-11.SCLK	28
CH-OUT-11.SDATA	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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