S P E C T R U M
I N S T R U M E N T A T I O N

PDN – Product Discontinuance Notice

Product Affected	M2i.30xx Series M2i.30xx-exp Series	Issue Date	1st January 2019
Reasons for Discontinuance	The complete series are replaced by a newer and advanced product series. Some electronic parts used on the series are discontinued by the manufacturers.	Last Time Buy Date	There is no fixed last time buy date as the availability depends on the number or purchases issued. We estimate that the products will be available until 2020 or longer.

The M2p.59xx-x4 series is a direct replacement for the M2i.30xx-exp and the M2i.30xx series. It offers many more versions with higher bandwidth and a faster sampling rate while only being half of the board size. Besides the main differences there are many small improvements that allow easier interfacing with different application areas. Although the replacement series has an improved interface the API is still the same making a migration from existing software an easy step.

The full M2p.59xx-4 series offers 20 different models ranging from 1 channel to 8 channels and 20 MS/s to 125 MS/s. A full list of products is found on Spectrum's website:

https://spectrum-instrumentation.com/en/m2p59xx-x4-pci-express-pcie-x4

Product Series Replacement Table

Please note that the legacy PCI version M2i.30xx has no direct replacement. Instead the PCIe version needs to be used.

Discontinued Product						Replacement Product					
Name	Resolution	Channels		Speed	Bandwidth	Name	Resolution	Channels		Speed	Bandwidth
		SE	Diff					SE	Diff		
M2i.3010-exp	12 Bit	1	-	80 MS/s	40 MHz	M2p.5940-x4	16 Bit	1	1	80 MS/s	40 MHz
M2i.3011-exp	12 Bit	2	-	40 MS/s	20 MHz	M2p.5931-x4	16 Bit	2	2	40 MS/s	20 MHz
M2i.3012-exp	12 Bit	1 2	- -	80 MS/s 40 MS/s	40 MHz	M2p.5941-x4	16 Bit	2	2	80 MS/s	40 MHz
M2i.3013-exp	12 Bit	4	-	40 MS/s	20 MHz	M2p.5932-x4	16 Bit	4	2	40 MS/s	20 MHz
M2i.3014-exp	12 Bit	2 4	- -	80 MS/s 40 MS/s	40 MHz	M2p.5942-x4	16 Bit	4	2	80 MS/s	40 MHz
M2i.3015-exp	12 Bit	1 2	- -	160 MS/s 80 MS/s	40 MHz	M4i.4420-x8	16 Bit	2	-	250 MS/s	125 MHz
M2i.3016-exp	12 Bit	1 2 4	- - -	160 MS/s 80 MS/s 40 MS/s	40 MHz	M4i.4421-x8	16 Bit	4	-	250 MS/s	125 MHz
M2i.3020-exp	12 Bit	1	-	100 MS/s	40 MHz	M2p.5960-x4	16 Bit	1	1	125 MS/s	60 MHz
M2i.3021-exp	12 Bit	2	-	50 MS/s	20 MHz	M2p.5941-x4	16 Bit	2	2	80 MS/s	40 MHz
M2i.3022-exp	12 Bit	1 2	- -	100 MS/s 50 MS/s	40 MHz	M2p.5961-x4	16 Bit	2	2	125 MS/s	60 MHz
M2i.3023-exp	12 Bit	4	-	50 MS/s	20 MHz	M2p.5942-x4	16 Bit	4	2	80 MS/s	40 MHz
M2i.3024-exp	12 Bit	2 4	- -	100 MS/s 50 MS/s	40 MHz	M2p.5962-x4	16 Bit	4	2	125 MS/s	60 MHz
M2i.3025-exp	12 Bit	1 2	- -	200 MS/s 100 MS/s	40 MHz	M4i.4420-x8	16 Bit	2	-	250 MS/s	125 MHz
M2i.3026-exp	12 Bit	1 2 4	- - -	200 MS/s 100 MS/s 50 MS/s	40 MHz	M4i.4421-x8	16 Bit	4	-	250 MS/s	125 MHz
M2i.3031-exp	12 Bit	2	-	60 MS/s	30 MHz	M2p.5941-x4	16 Bit	2	2	80 MS/s	40 MHz
M2i.3033-exp	12 Bit	4	-	60 MS/s	30 MHz	M2p.5942-x4	16 Bit	4	2	80 MS/s	40 MHz

Please note that the replacement card for the fast versions, the M4i.44xx is not described in this document.

SE = Single-Ended Inputs
Diff = Differential Inputs

Feature Comparison

Feature	M2i.xxxx-exp PCIe Card	M2i.xxxx PCI Card	M2p.xxxx-x4 PCIe Card	Remarks
Size	312 mm x 107 mm full length, full height		168 mm x 107 mm half length, full height	1/2 PCIe size fits into many more systems

Feature	M2i.xxxx-exp PCIe Card	M2i.xxxx PCI Card	M2p.xxxx-x4 PCIe Card	Remarks
Power Consumption	Max 28 Watts	Max 23 Watts	Max 18 Watts	
On-board memory	Standard 512 MByte, Option 2 GByte		Standard 1 GByte	Fast streaming speed makes memory option superfluous
Interface	PCIe x1 Gen1	PCI 32 Bit 66 MHz	PCIe x4 Gen1	Legacy PCI interface discontinued
Data Transfer Speed	160 MByte/s	200 MByte/s	700 MByte/s	4 times faster transfer speed allows more streaming applications
FIFO Mode Buffering	Some data always stays in FIFO buffers, needs force trigger to read last acquired segments.		Complete FIFO buffer readable at any time.	In FIFO mode M2p series allows to read out all data that has been acquired, no data remains in buffers, no need for force trigger.
SCAPP GPU Interface	Not available		Available	Data can be transferred directly to a CUDA-based GPU for fast data processing
I/O lines	1 x Trigger I/O 1 x Clock I/O		1 x Trigger-In 1 x Clock-In 1 x Multi-Purpose-Out 3 x Multi-Purpose-I/O	4 additional I/O lines as standard can be used for easy interfacing with other equipment. The 3 x Multi-Purpose I/O can also be used for synchronous digital-in (digitizer) or synchronous marker outputs (AWG)
Clock Modes	Internal External Reference		Internal External Reference Direct External Clock	Direct external clock now allows variable clock between 1 MHz and max sampling rate, ideal for OCT applications
External Clock Ranges	User needs to know and program the clock range		Not needed	External clock now independent of clock range and channel config
Clock Accuracy	20 ppm		1 ppm	1 ppm was an option for M2i series and is now standard
Clock Setup Granularity	1% of range: 1 MHz for range. 10 MHz to 100 MHz		1 Hz	Clock setup has far improved
External trigger	3.3V LVTTL		Level comparator ±5V	
External trigger sources	1 as standard + 2 as option		4 as standard	
Trigger hold-off	Not available		0 to 4 GSamples	New feature: programmable trigger hold-off for multi/gate/aba mode
Timestamp Ref Clock	Needed option BaseXIO		Standard	
Trigger Source Mark	Not available		Standard	Trigger source is automatically stored with timestamp and can be examined for each trigger event.
Data Ordering	Non linear for cards with two analog modules: ch0, ch2, ch1, ch3		Linear for all cards: ch0, ch1, ch2, ch3	Easier data access
API Interface	SPCM		SPCM	Same API Interface

Option Replacement Table

Option	M2i Card	M2p Card	Remarks
Synchronization Star-Hub Small	M2i.xxxx-SH5	M2p.xxxx-SH6ex M2p.xxxx-SH6tm	Two mounting options allow to match the system restrictions. Ex = extension, card is extended to 3/4 PCIe length but still only 1 slot width Tm = top-mount, star-hub is mounted on top, card length stays at 1/2 PCIe length but occupies two slots
Synchronization Star-Hub Large	M2i.xxxx-SH16	M2p.xxxx-SH16ex M2p.xxxx-SH16tm	
BaseXIO lines	M2i.xxxx-bxio	3 to 4 lines standard	The standard card already contains one Multi-Purpose output and three Multi-Purpose I/O lines which replace the BaseXIO option. Please contact Spectrum if you are in need of more lines.

Feature Comparison – Analog Module

Feature	30xx	59xx	Remarks
Connectors Analog Trigger Clock Multi-Purpose	SMB SMB SMB not available	SMB SMB SMB MMCX	A different mounting method of the 59xx SMB connectors matches more vendors SMB cable connectors
Resolution	12 Bit	16 Bit	
Input Mode	Single-ended	Single-ended or differential	Each two single-ended channels can be combined to one differential channel
Sampling Speed	40 MS/s to 200 MS/s	20 MS/s to 125 MS/s	
Bandwidth	20 MHz to 40 MHz	10 MHz to 60 MHz	
Input Ranges	±200 mV to ±10 V	±200 mV to ±10 V	
Input Offset	±100% (single-ended)	±100% (single-ended)	
Trigger Level Resolution	10 bit	16 bit	
Re-Arming Time	4 samples	24 samples	+ programmed pre-trigger + programmed hold-off
Digital Inputs	Option with up to 32 channels	3 channels as standard	Additional digital input option planned but not yet released.

Obsolescence Policy

With release of the PDN the complete product series is no longer available for new projects. The complete stock is reserved for existing projects and for customers who are not able to change to the new series due to certification, hardware or software limitations.

In case that the only limitation that prevents you from ordering the new product series is the missing legacy PCI interface we strongly recommend switching to the newer PCI Express interface. The legacy PCI has been obsolete for years now and you will most likely face problems in the future when you need to replace the PC system.

More detailed information on the obsolescence policy is found online: https://spectrum-instrumentation.com/en/obsolescence-policy

If you have any questions or concerns about switching from the obsolete M2i.30xx series products to the replacement M2p.59xx series please contact Spectrum directly at request@spec.de

Please find additional information on our website:

- Data sheet of M2p.59xx series:
  https://spectrum-instrumentation.com/sites/default/files/download/m2p59_datasheet_english.pdf

- Manual of M2p.59xx series:
  https://spectrum-instrumentation.com/sites/default/files/download/m2p_59xx_manual_english.pdf

- Data sheet of M4i.44xx series:
  https://spectrum-instrumentation.com/sites/default/files/download/m4i44_datasheet_english.pdf

- Manual of M4i.44xx series:
  https://spectrum-instrumentation.com/sites/default/files/download/m4i_m4x_44xx_manual_english.pdf

- Manual of M2i.30xx series:
  https://spectrum-instrumentation.com/sites/default/files/download/m2i30_manual_english.pdf