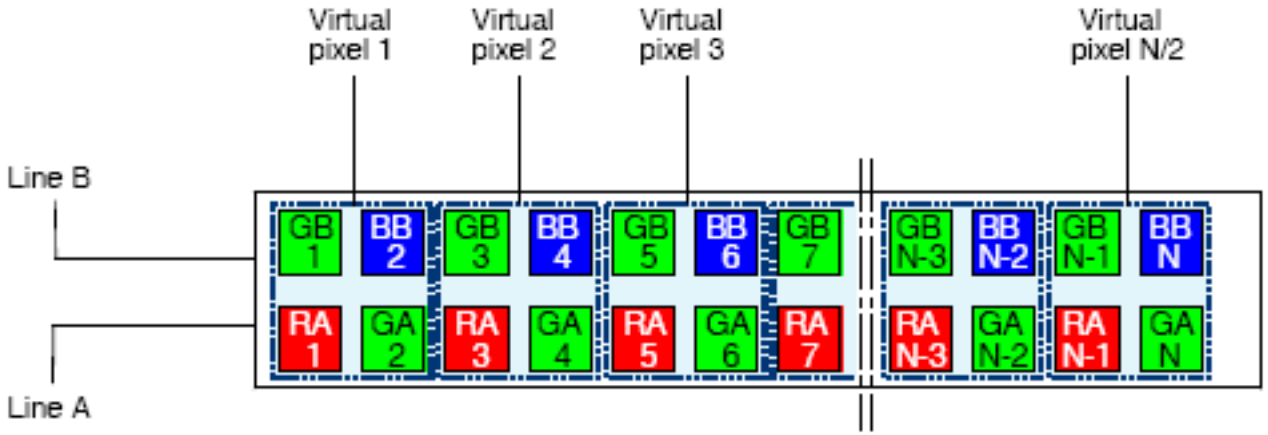
The Basler Sprint Color Line Scan Camera

- The Baser Sprint Cameras use a new color line sensor design that acheives extremely high line rates.
- The Sprint uses a Bayer pattern sensor to produce color information.
- Camera outputs raw data, color is create by interpolation (demosaicing) pixel data.



BitFlow Support for the Balser Sprint

- **Bayer interpolation is very CPU intensive, therefore BitFlow has implemented demosiacing on the Karbon in hardware.**
- **Karbon hardware can keep up with the camera and output color at the same line rate as the camera.**
- **Karbon supports two interpolation methods: Full Step and Half Step.**

Feature	Half Step	Full Step
Advantage	Image Quality	Image Speed
Image coverage	Each point on object is imaged twice	Each point on object is imaged once
Colors	Each point on objects gets a green pixel and a red or blue pixel	Each point on object gets either a red, green or blue pixel.
Color line rate (assume spL4096-70kc)	35 KHz	70 KHz
Input lines per output line	2 to 1	1 to 1
Color data output rate (assume spL4096-70kc at max line rate)	430 MB/S	860 MB/S
Required Karbon	KBN-PCE-CL2-F	KBN-PCE-CL4-F

- **Note that the camera should be in "Raw Line Acqusition Mode" for both Half Step and Full Step modes.**
- **Direct acquisition of raw data, and RGB data is also supported.**
- **All Monochrome Sprint cameras are also supported.**

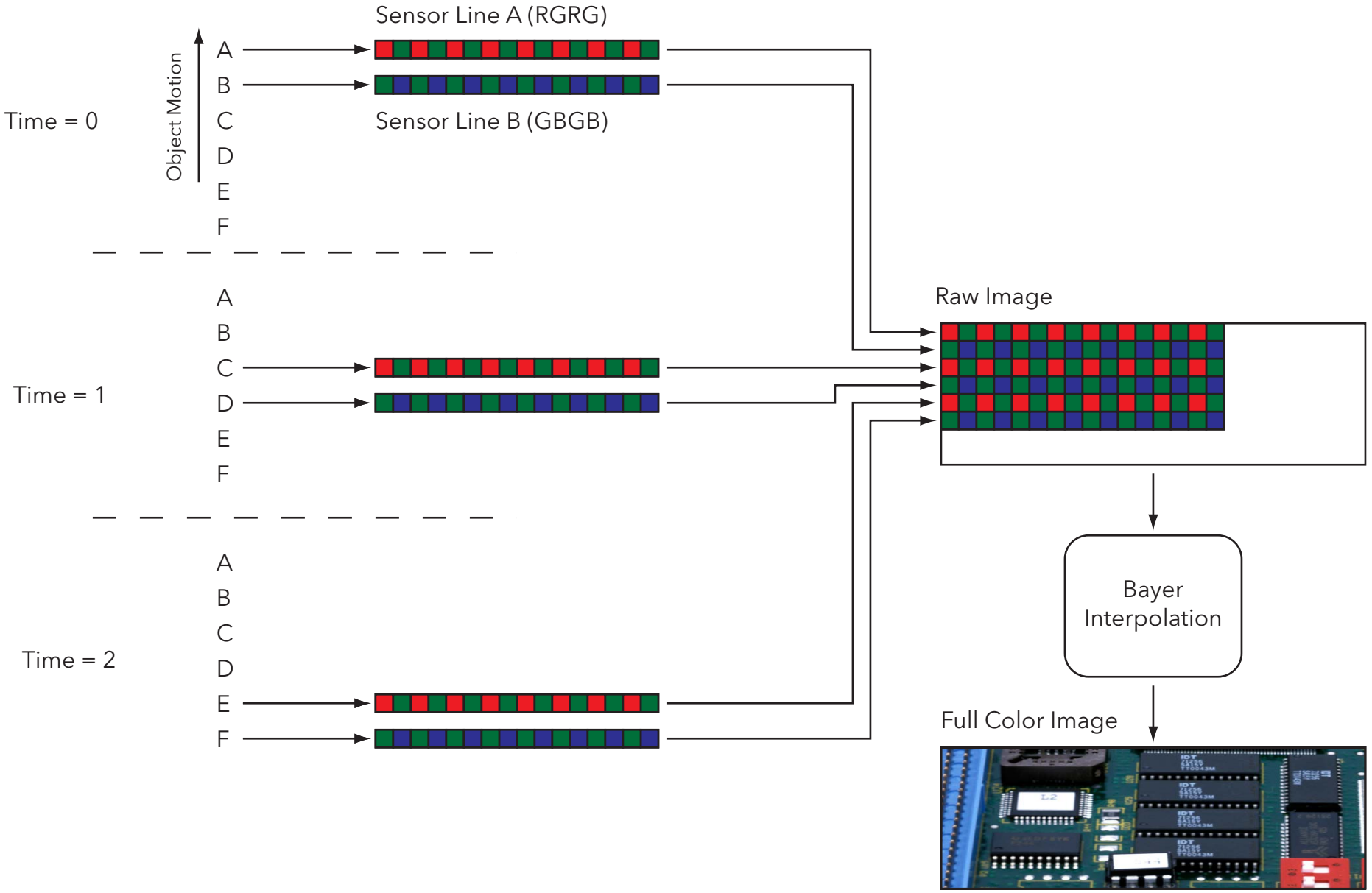
Support for the Balser Sprint Models

- **The following table shows all the Sprint color cameras and the required BitFlow frame grabber (for one and two cameras).**

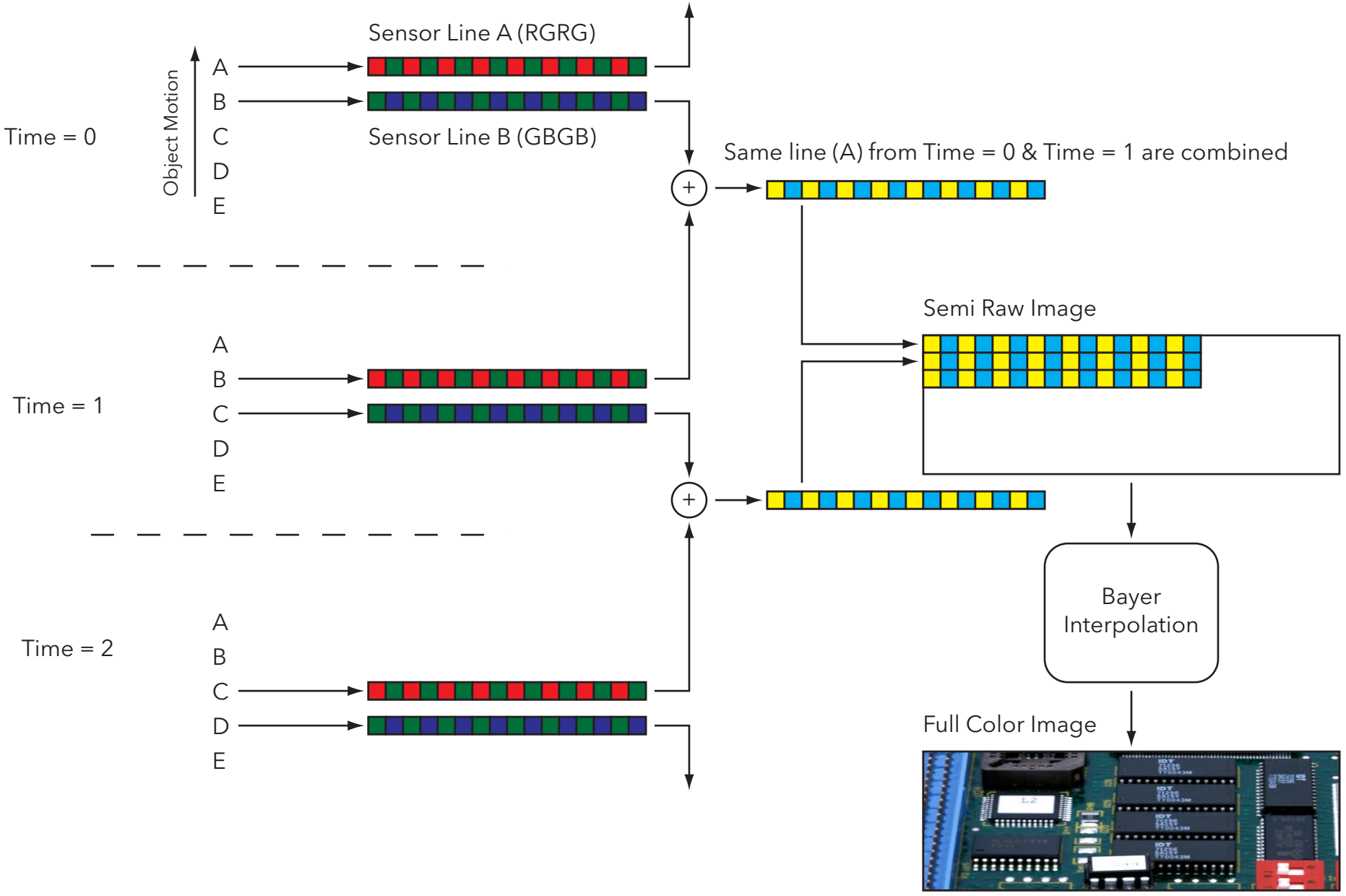
Basler Sprint Model	Output Mode	Data type	Recommended Karbon Model For One Camera	Recommended Karbon Model For Two Cameras	Capture Maximum Line Rate
spL4096-39kc	4 Taps, 40 MHz	8-Bit Unconverted	KBN-PCE-CL2-F	KBN-PCE-CL4-F	39 KHz
		24-Bit Color, Full Step	KBN-PCE-CL2-F	KBN-PCE-CL4-F	39 KHz
		24-Bit Color, Half Step	KBN-PCE-CL2-F	KBN-PCE-CL4-F	19 KHz*
spL4096-70kc	4 Taps, 40 MHz	8-Bit Unconverted	KBN-PCE-CL2-F	KBN-PCE-CL4-F	39 KHz
		24-Bit Color, Full Step	KBN-PCE-CL2-F	KBN-PCE-CL4-F	39 KHz
		24-Bit Color, Half Step	KBN-PCE-CL2-F	KBN-PCE-CL4-F	19 KHz*
	4 Taps, 80 MHz	8-Bit Unconverted	KBN-PCE-CL2-F	KBN-PCE-CL4-F	70 KHz
		24-Bit Color, Full Step	KBN-PCE-CL2-F	Not Supported	55 KHz**
		24-Bit Color, Full Step	KBN-PCE-CL4-SP	Not Supported	70 KHz
		24-Bit Color, Half Step	KBN-PCE-CL2-F	KBN-PCE-CL4-F	39 KHz*
spL8192-20kc	4 Taps, 40 MHz	8-Bit Unconverted	KBN-PCE-CL2-F	KBN-PCE-CL4-F	39 KHz
		24-Bit Color, Full Step	KBN-PCE-CL2-F	KBN-PCE-CL4-F	39 KHz
		24-Bit Color, Half Step	KBN-PCE-CL2-F	KBN-PCE-CL4-F	19 KHz*
spL8192-39kc	4 Taps, 40 MHz	8-Bit Unconverted	KBN-PCE-CL2-F	KBN-PCE-CL4-F	19 KHz
		24-Bit Color, Full Step	KBN-PCE-CL2-F	KBN-PCE-CL4-F	19 KHz
		24-Bit Color, Half Step	KBN-PCE-CL2-F	KBN-PCE-CL4-F	10 KHz*
	4 Taps, 80 MHz	8-Bit Unconverted	KBN-PCE-CL2-F	KBN-PCE-CL4-F	39 KHz
		24-Bit Color, Full Step	KBN-PCE-CL2-F	Not Supported	25 KHz**
		24-Bit Color, Full Step	KBN-PCE-CL4-SP	Not Supported	39 KHz
		24-Bit Color, Half Step	KBN-PCE-CL2-F	KBN-PCE-CL4-F	19 KHz*

*Half step output rate is half of the input rate
** PCIe Bandwidth Limited

Full Step Bayer Processing

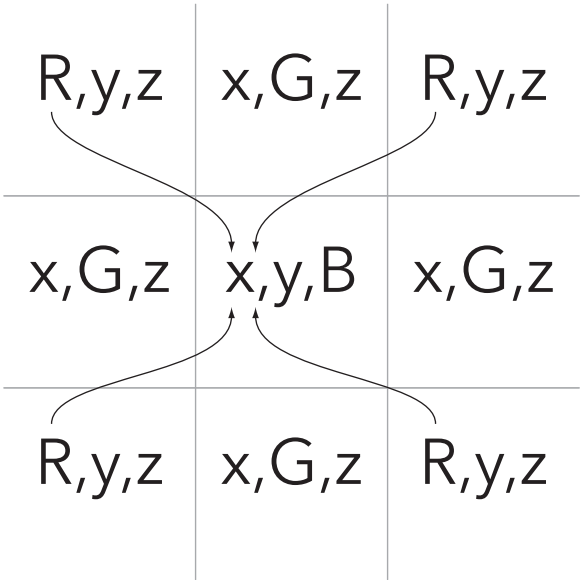


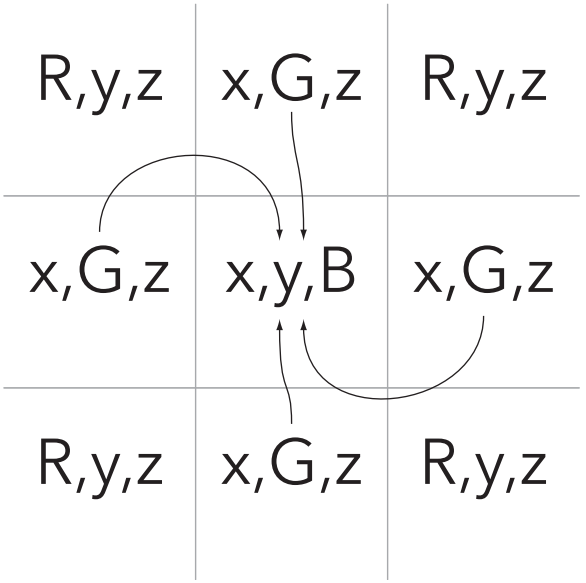
Half Step Bayer Processing



Full/Half Step Interpolation Details

Full Step





Half Step