

## Double Shot Sync Mode for PIV and Fluid Flow Applications



### Ideal for Particle Image Velocimetry Applications

The i-SPEED DF is designed for Particle Image Velocimetry applications. The unique double-pulse system allows two pulses to be sent out on the Sync Out line. When used with a standard timing generator, the i-SPEED DF allows lasers to be strobed on either side of the 1 microsecond inter-frame time to create PIV maps.

The i-SPEED DF has been integrated into the world's premier PIV software systems from Dantec, La Vision, and Xcitex.

### FEATURES

- Color rich 1280 x 1024 pixel resolution sensor
- Extreme light sensitivity
- Maximum Frame Rate of 300,000 fps
- 1  $\mu$ s global electronic shutter
- Double-shot capable for laser sync mode
- Seamless integration with award-winning CDU for remote access
- Random Access Mode for fast external sync
- i-CHEQ externally visible status indicators
- i-FOCUS electronic lens focusing aid
- Economy Mode: 16 x 9 aspect ratio setting 720P
- On board measurement of distance, speed, acceleration, angle, angular velocity, and angular acceleration
- Phase lock auto synchronization of multiple cameras

## IMAGER

<b>Sensor Type</b>	Custom CMOS
<b>Resolution</b>	1280 x 1024
<b>Sensor Size</b>	1.36" (diagonal) 0.847" x 1.06"
<b>Pixel Size</b>	21 micron
<b>Aspect Ratio</b>	5:4
<b>Shutter type</b>	Global Exposure
<b>Shutter time</b>	2.16 µs (HQ mode) / 1 µs (QS Mode)
<b>Bit Depth</b>	10 bit
<b>Maximum Frame Rate</b>	300,000 fps
<b>Sensor</b>	Sealed unit, no dust ingress
<b>ISO Rating (ISO 12232)</b>	Mono 5,000/Mono 40,000+ Color 1,600/Color 12,800+

## SYNCHRONIZATION and CAPTURE

<b>Trigger</b>	TTL T0 to 0-100%
<b>Trigger modes</b>	Circular, ROC, BROCC
<b>Sync</b>	24Hz – 500kHz, double shot capable
<b>iCHEQ</b>	Camera status LEDs
<b>iFocus</b>	Focusing aid tool
<b>Control</b>	PC or CDU
<b>Internal Memory</b>	2GB standard, upgrade to 16GB

## PHYSICAL and ENVIRONMENTAL

<b>Dimensions</b>	4.41" (W) x 5.55" (H) x 13.4" (L)
<b>Weight</b>	11 lb including battery
<b>Input Voltage</b>	14 V -0% to 28 V +5%
<b>Power Consumption</b>	Camera 70 W max/System 80 W max
<b>Mounting</b>	5 x 1/4" Whitworth threads located on three sides
<b>Battery (optional)</b>	Li-Ion, 10.8V, 45 minutes continuous usage
<b>Lens Mounting</b>	F-Mount
<b>EMC</b>	CISPR22 (B S EN55022), CISPR24 (BS EN55024)
<b>Safety</b>	BS EN61010-1
<b>CE Marking</b>	EMC Directive (Camera), LV Directive and EMC Directive (Power Supply)
<b>Lead Free</b>	RoHS Directive
<b>WEEE</b>	Compliant
<b>IP Rating</b>	IP 20
<b>Temperature</b>	32 °F to +104 °F operation, -4 °F to +140 °F storage
<b>Pressure</b>	71 kpa to 106 kpa
<b>Relative Humidity</b>	95% at 104 °F non-condensing
<b>HG Cameras</b>	100 G @ 11 milliseconds, IEC 68-2-27 Ea 100 G @ 2 milliseconds IEC 68-2-29 Eb

## CDU

<b>Dimensions</b>	10.5" (W) x 8.27" (H) x 1.69" (L)
<b>Weight</b>	2.8 lb
<b>Display</b>	8.4" LCD Daylight viewing
<b>Input Voltage</b>	12 V ± 10%
<b>Power Consumption</b>	8 W maximum

## PC SOFTWARE

<b>Standard</b>	Control
<b>Premium</b>	ControlPro
<b>Data Collection Module</b>	Optional
<b>Utilities</b>	i-SPEED Lens Calculator, i-SPEED Viewer
<b>Software Developers Kit</b>	C++, LabView

## CONNECTIVITY

<b>Video outputs</b>	BNC 50ohm, S-Video
<b>USB</b>	USB 2
<b>Network</b>	100MB RJ45
<b>CDU</b>	BNC 75ohm
<b>Video</b>	AVI (JPG, BMP), HSV
<b>Image sequence</b>	TIFF, BMP, JPG, RAW
<b>Ethernet control</b>	100MB
<b>Remote control</b>	Via software or remote keypad

## PURCHASING OPTIONS

<b>Sensor</b>	Color / Mono
<b>Memory</b>	2 GB (Std) / 4 GB / 8GB / 16GB
<b>Package</b>	Standard / Hi-G rated
<b>Warranty</b>	1 yr (std) / 2 yr

## FRAME RATES, RESOLUTION and DURATION

### i-SPEED DF (HIGH-QUALITY) HQ MODE 4 GB INTERNAL MEMORY

FPS	Resolution	Frames in Memory	Record Time(s)
1	1280x1024	2,447	2447.000
25	1280x1024	2,447	97.880
100	1280x1024	2,447	24.470
150	1280x1024	2,447	16.313
200	1280x1024	2,447	12.235
300	1280x1024	2,447	8.157
400	1280x1024	2,447	6.118
500	1280x1024	2,447	4.894
1,000	1280x1024	2,447	2.447
1,500	1280x1024	2,447	1.631
2,000	1280x1024	2,447	1.224
3,000	1068x800	3,767	1.256

### i-SPEED DF (QUALITY WITH SPEED) QS MODE

FPS	Resolution	Frames in Memory	Record Time(s)
100,000	108x80	372,522	3.725
125,000	84x60	638,625	5.109
150,000	72x52	859,667	5.731

### i-SPEED DF (SHORT INTER-FRAME) SIF MODE

FPS	Resolution	Frames in Memory	Record Time(s)
3,000	1104x828	3,521	1.174
4,000	948x708	4,795	1.199
5,000	840x628	6,101	1.220
7,500	672x504	13,587	1.267
10,000	564x420	13,587	1.359
15,000	456x340	20,759	1.384
20,000	384x288	29,103	1.455
30,000	300x224	47,895	1.596
40,000	252x188	67,937	1.698
50,000	216x160	93,130	1.863
75,000	168x124	154,502	2.060
100,000	132x96	253,992	2.540
150,000	96x72	465,653	3.104
200,000	84x60	638,610	3.193
300,000	48x36	1,862,613	6.208

Note: Record time is directly proportional to memory size

\*The CDU is patented in the UK, patents pending in other markets

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