PRELIMINARY

HIGH-SPEED GATED IMAGE INTENSIFIER UNITS

C9548 SERIES

OVERVIEW

Image intensifiers (I. I.) are devices capable of intensifying an image at high gain and high-speed gating (electronic shutter operation). This allows them to capture "instantaneous images" of ultrafast phenomena that occur in extremely short periods of time.

The C9548 series is an image intensifier unit which is suitable for PIV application. It has a built-in pulse generator to allow multi-exposure (burst) operation.

The GaAsP photocathode is ideal for low-light-level imaging in the visible region such as for fluorescence observations. The multialkali photocathode on the other hand offers high sensitivity over a wider spectral response range from the UV through near IR region so observations can be made at various wavelengths.

By using a relay lens, the C9548 series can be easily connected to various CCD cameras or high-speed cameras. The image intensifier gain, gate width and delay time can be controlled and set from a PC through the RS-232C interface. (The image intensifier gain can also be controlled and set from the remote controller.)

FEATURES

- **Maximum Repetition Frequency: 200 kHz**
- **Built-in Pulse Generator**
- **Multi-exposure**
- **High-speed Gating: 10 ns minimum**
- **High Performance Image Intensifier**
  - **High quantum efficiency in visible range: GaAsP photocathode type**
  - **Wide spectral response range from UV to near IR: Multialkali photocathode type**

APPLICATIONS

- **Analysis of High-speed Phenomenon**
  - **PIV / Engine combustion state**
  - **Plasma emission / Discharge / Flow / Spray and so on.**

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SPECIFICATIONS

Parameter		C9548-01	C9548-02	C9548-03	C9548-04	Unit
Photocathode Sensitivity	Luminous Sensitivity (Typ.)	700		230	150	μA/lm
	Radiant Sensitivity Ⓐ (Typ.)	192		53	47	mA/W
	Quantum Efficiency Ⓐ (Typ.)	45		15	14	%
Photocathode	Effective Diameter	25 Ⓑ				mm
	Window Material	Borosilicate glass		Synthetic silica		—
	Photocathode Material	GaAsP		Multialkali		—
	Spectral Response	280 to 720		185 to 900		nm
	Peak Wavelength	530		430		
Input Mount (Lens Mount)		F-mount (C-mount selectable)				—
Phosphor Screen	Window Material	FOP				—
	Phosphor Material	P46 (P24 or P43 selectable)				—
	Decay Time	See [Phosphor Screen Decay Characteristics]				—
Gain	Luminous Gain (Typ.)	6.6×10^3	1.5×10^6	3.3×10^3	1.0×10^6	$(lm/m^2)/lx$
	Radiant Emittance Gain Ⓐ (Typ.)	4.2×10^3	1.0×10^6	2.0×10^3	7.0×10^5	$(W/m^2)/(W/m^2)$
Equivalent Background Input (EBI) Ⓒ	Luminous (Typ.)	8×10^{-12}		1×10^{-11}		lm/cm^2
	Radiant Ⓐ (Typ.)	2×10^{-15}		3×10^{-14}		W/cm^2
Limiting Resolution (Typ.)		50	36	57	32	Lp/mm
Image Magnification		1				—
Maximum Input Light Level Ⓓ	Luminous (Typ.)	1.5×10^{-3}	7.0×10^{-6}	5.0×10^{-3}	1.6×10^{-5}	lx
	Radiant Ⓐ (Typ.)	4.0×10^{-10}	1.6×10^{-12}	8.0×10^{-10}	2.4×10^{-12}	W/cm^2
Average of Max. Phosphor Screen Brightness		10				cd/m^2
Power Requirement		100 to 240				V
Power Consumption (Max.)		12	15.6	12	15.6	W
Operating Ambient Temperature		0 to +40				°C
Storage Temperature		-20 to +50				
Operating and Storage Humidity Ⓔ		Below 70				%

NOTE: ⒶAt wavelength of peak sensitivity
ⒷEffective output area is 16 mm × 16 mm. Take the effective area of the camera and reduction rate of the relay lens to be used into account.
ⒸInput illuminance (or irradiance) required to produce a luminous emittance from the phosphor screen, which is equal to that obtained when no light is indent on the photocathode. This indicates the lower limit of detectable illuminance (or irradiance) level of an image intensifier.
ⒹDuring normal (continuous) mode at maximum gain ⒺNo condensation

Protective Functions

Parameter		C9548 Series
Repetition Rate	Max.	200 kHz
	Display	Red LED is lit continuously *
Excessive Light Protection		Shuts off operation during excessive light
	Warning	Red LED flashes * (on rear of head and remote controller operation panel)
	Shut off	Red LED is lit continuously * (on rear of head and remote controller operation panel)
Protection Circuit Reset		Reset switch on the remote controller or sending command via RS-232C interface

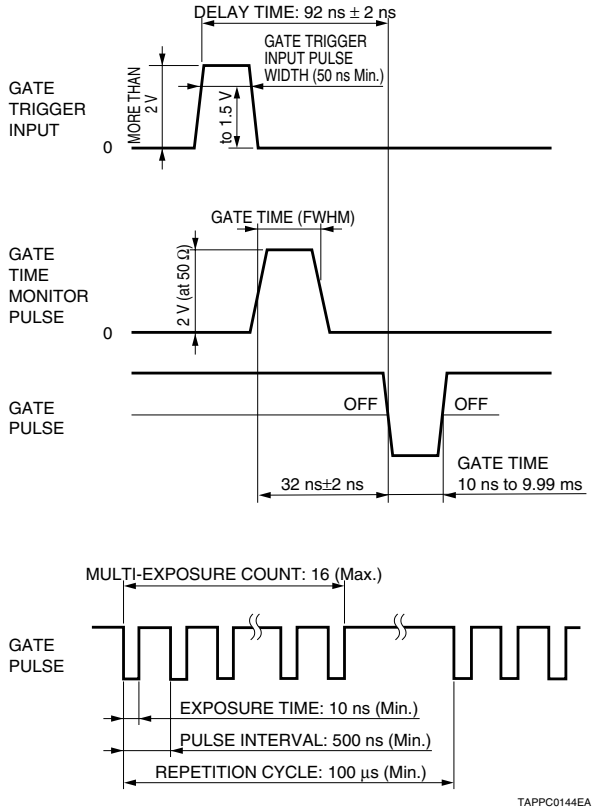
NOTE: *The LED on near of head can be turned out by control software.

Gate Specifications

Parameter		C9548 Series
Operation Mode		Normal (continuous) mode / Single gate mode / Burst gate mode
Single Gate Mode	Gate time *	10 ns to 9.99 ms
	Repetition Frequency (Max.)	200 kHz (protection circuit incorporated)
	Delay Time *	10 ns to 9.99 ms
Burst Gate Mode	Pulse Interval * (Min.)	500 ns
	Number of Exposures (Max.)	16
	Exposure Time * (Min.)	10 ns
	Repetition Cycle (Min.)	100 μs
Gate Trigger Input	Level	TTL positive logic
	Input Impedance	1 kΩ
Gate Output	Basic Delay Time	92 ns ± 2 ns
	Gate Jitter (Max.)	2 ns (10 ns maximum when gate time is set to 10 μs or more)
Gate Time Monitor	Output Level	2 V positive logic
	Pulse Width	Gate time width (FWHM)
	Output Impedance	200 Ω

NOTE: * Setting resolution is 10 ns.

TIME SEQUENCE



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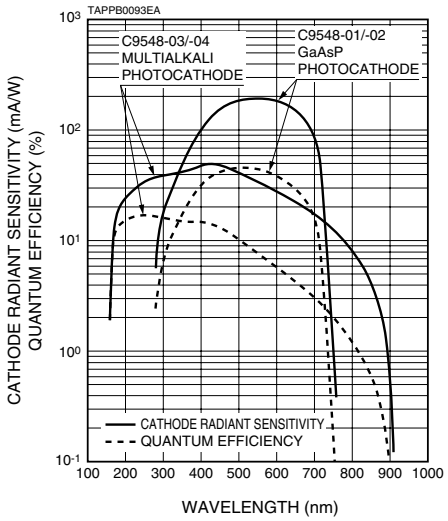
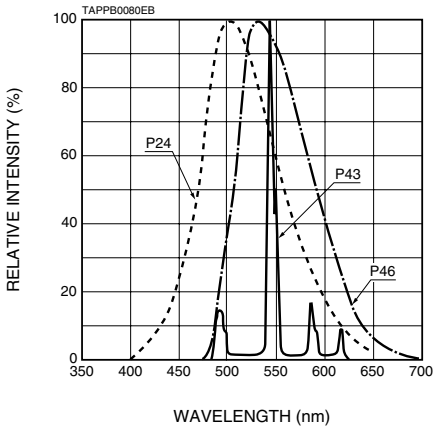
CHARACTERISTICS

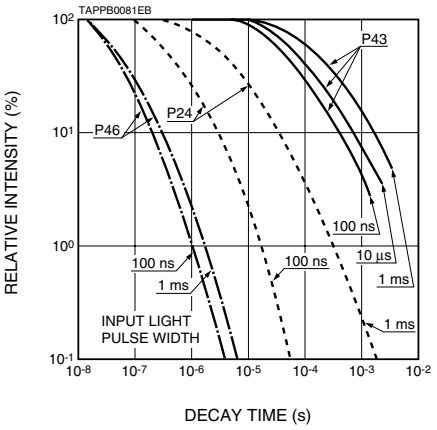
●Typical Spectral Response



●Typical Phosphor Screen Spectral Emission

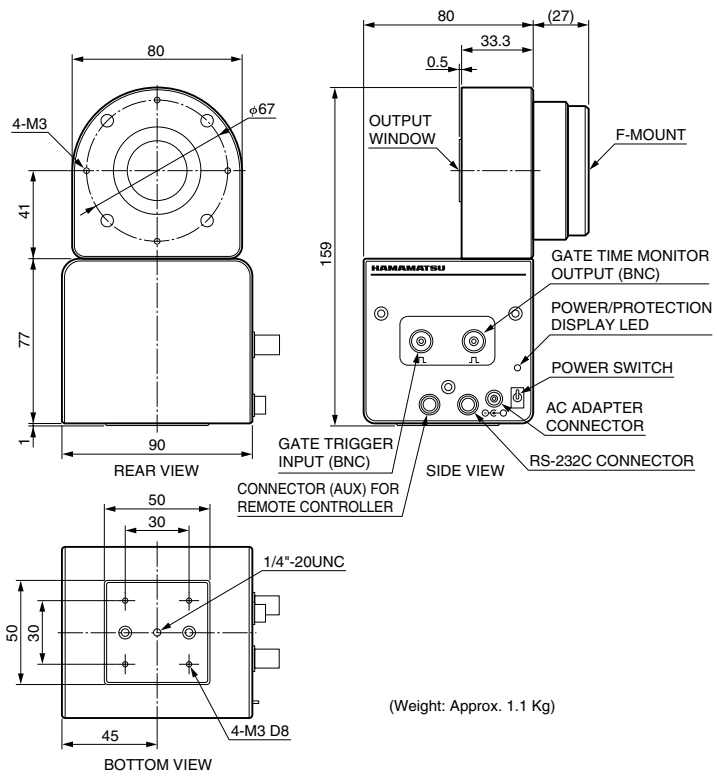


●Typical Phosphor Screen Decay Characteristics



DIMENSIONAL OUTLINES (Unit: mm)

●Head (F-mount Type)



(Weight: Approx. 1.1 Kg)

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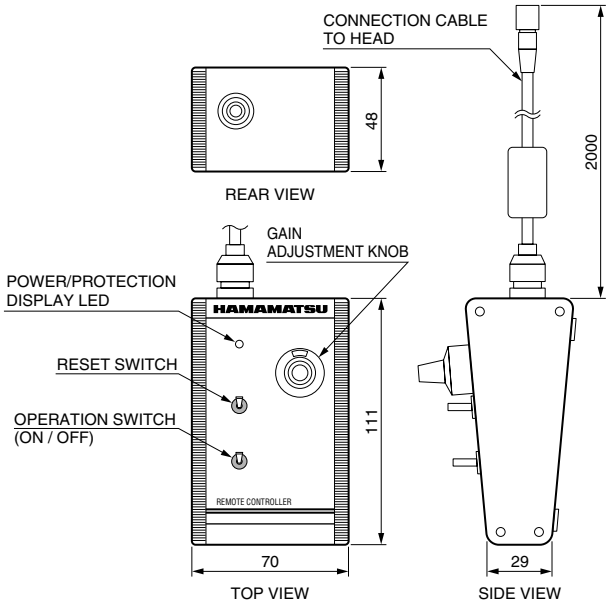
●Remote Controller



(Weight: Approx. 300 g)

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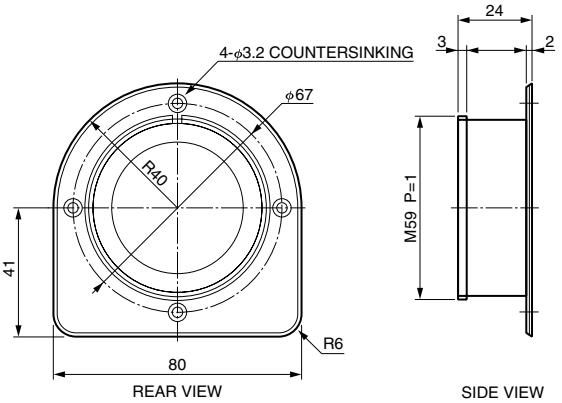
●Relay Lens Adapter A9549 (Sold Separately)



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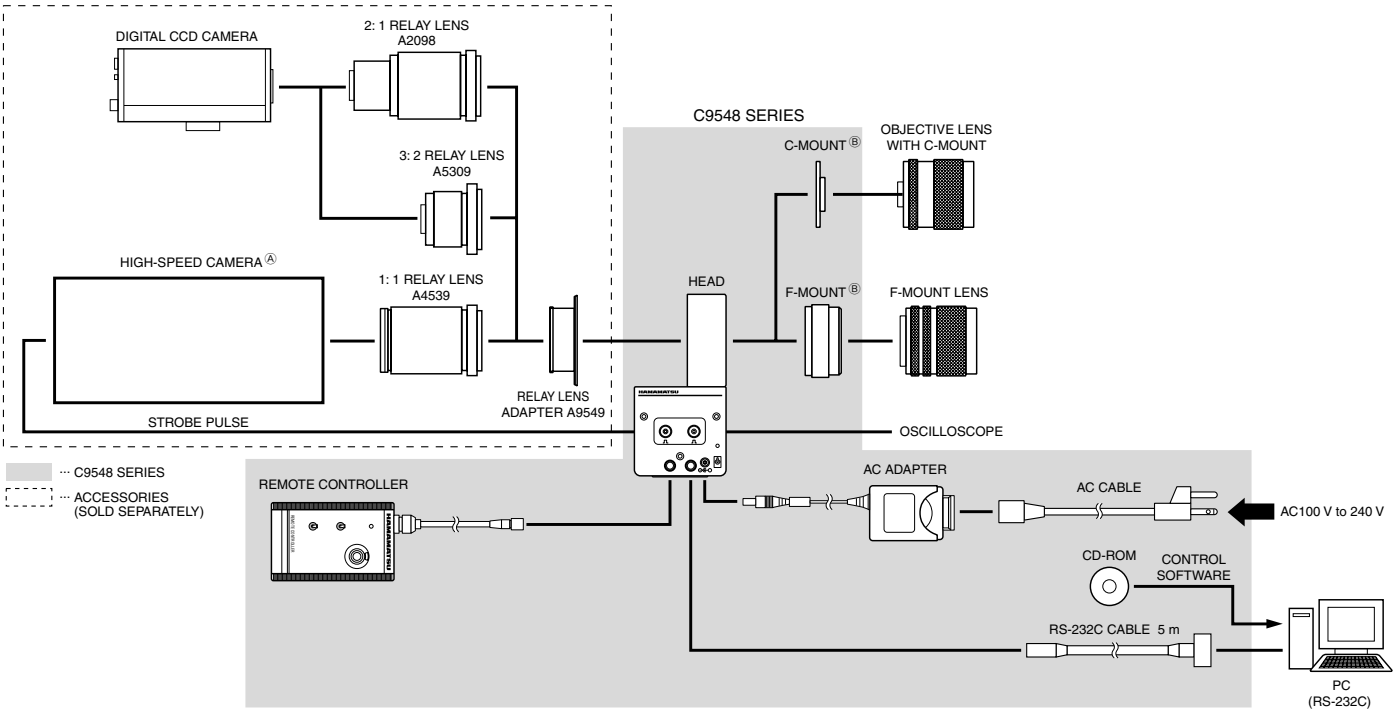
SETUP EXAMPLE WITH OPTICAL ACCESSORIES



NOTE: ⒶConnection to a high-speed camera may not be possible depending on the readout frame rate. Always consult us before placing an order.
ⒷSelect C-mount or F-mount at ordering.

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