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Signal processing circuits for PSD

C9068-01 C9069-01

Digital output for connection with PC

The C9068-01 (for one-dimensional PSD) and C9069-01 (for pin-cushion type two-dimensional PSD) are DC signal processing circuits specifically designed for position measurement using PSD. Digital output allows direct connection with a personal computer through a serial (RS-232C) interface. The C9068-01 and C9069-01 are capable of detecting accurate positions of a spot light regardless of light intensity.
A D/A conversion signal is also output for monitoring, and when a voltmeter is connected to this D/A conversion output, the output voltage value directly represents position data. (Output voltage represents the distance from the center of PSD. 1 V=1 mm)

Features

- **Digital output**
- **Serial (RS-232C) connection with PC**
- **D/A conversion signal output for monitoring**
- **Easy handling due to single +12 V supply operation**
- **No complicated adjustment required**

Applications

- **Displacement measurement**
- **Testing using PSD**
- **PSD performance evaluation**

Absolute maximum ratings (Ta=25 °C, unless otherwise noted)

Parameter	Symbol	Value	Unit
Supply voltage	Vs max	+13	V
Operating temperature*1	Topr	0 to +40	°C
Storage temperature*1	Tstg	-10 to +60	°C
PSD input current	Ipin max	9×10^{-4}	A
Supply current	Iin max	2	A

*1: No dew condensation
When there is a temperature difference between a product and the surrounding area in high humidity environments, dew condensation may occur on the product surface. Dew condensation on the product may cause deterioration in characteristics and reliability.
Note: Exceeding the absolute maximum ratings even momentarily may cause a drop in product quality. Always be sure to use the product within the absolute maximum ratings.

Electrical and optical characteristics (Ta=25 °C, Vs=+12 V)

Parameter		Symbol	Min.	Typ.	Max.	Unit
Conversion impedance		Zt	-	1×10^{5}	-	V/A
Feedback capacitance		Cf	-	100	-	pF
Input photocurrent*2	C9068-01	Ip	1×10^{-5}	-	9×10^{-5}	A
	C9069-01		1×10^{-5}	-	9×10^{-5}	A
Signal conversion time*3		-	5	-	-	ms
Digital output format		-	Conforms to RS-232C (position signal, light level monitor output) 12-bit			-
D/A conversion maximum output amplitude voltage		Vfs	-	-	±10	V
Operating supply voltage		Vs	+11.5	+12	+12.5	V
Current consumption		Is	-	200	-	mA

*2: Photocurrent Ip (total input signals) from PSD mounted on the C9068-01 or C9069-01 circuit board
*3: Output response time versus spot light position change
*4: A power supply of approximately 12 V and 1.25 A is recommended. The electric current for operating this product varies depending on the use environment. Please check in advance.

Combination with a PSD

A PSD is installed (soldered) on the signal processing circuit.
Note: PSDs are sold separately.

■ C9068-01 (applicable PSD: one-dimensional PSD)

Type no.	Photosensitive area size (mm)	Position resolution*5 *6 (μm)	Package (mm)	Installation on board	External attachment*7
S3931	6 × 1	1.5	Ceramic (9.2 × 4.8)	○	○
S3932	12 × 1	3	Ceramic (15.2 × 4.8)	○	○
S8543	24 × 0.7	5.9	Ceramic (36.7 × 4)	×	○*8
S4583-04	3 × 1	0.8	Plastic	×	○*8
S4584 series	3.5 × 1	0.9	Plastic	×	○*8
S3274-05	3.5 × 1	0.9	Plastic	×	○*8
S7105 series	4.2 × 1	1.1	Plastic	×	○*8
S15430-01CT/-02CT	1 × 6	1.5	Glass epoxy	×	○*8
S15430-03CT					

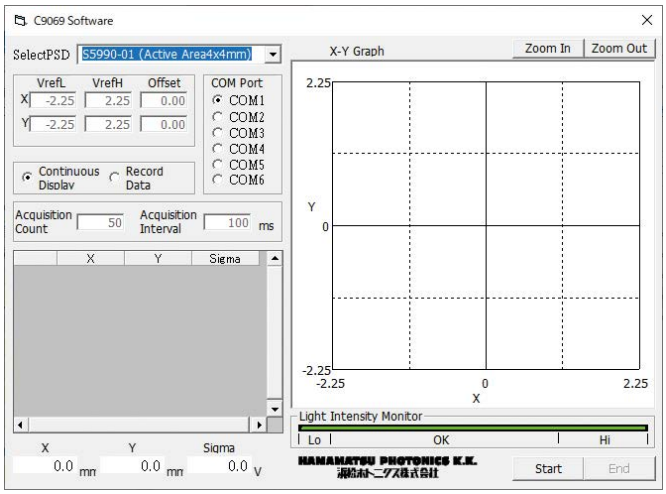
■ C9069-01 (applicable PSD: two-dimensional PSD)

Type no.	Photosensitive area size (mm)	Position resolution*6 *9 (μm)	Package (mm)	Installation on board	External*7 attachment
S2044	4.7 × 4.7	1.4	Metal (TO-8 ϕ14)	○	○
S5990-01	4 × 4	1.1	Ceramic chip carrier (8.8 × 10.6)	×	○*10
S5991-01	9 × 9	2.5	Ceramic chip carrier (14.5 × 16.5)	×	○*10

*5: Reference value. Digital output Σ=5 to 9 V. 40% range from the center to the end with respect to the PSD photosensitive length L.
*6: When PSD is mounted. The position resolution may vary depending on the connection method, operating environment, and so on.
*7: Wiring using shielded wires or AWG#26 or equivalent twisted pair wires (no longer than 30 cm) is recommended.
*8: These PSDs cannot directly be mounted on the product. Mount the PSD on the printed circuit board prepared separately, and connect the printed circuit via the wiring to the through-holes for externally connected PSD.
*9: Reference value. Digital output Σ=5 to 9 V. Within a circle with a diameter equal to 40% of PSD photosensitive area length L
*10: The S5990-01 or S5991-01 can be mounted on the C9069-01 using the supplied dedicated circuit board.

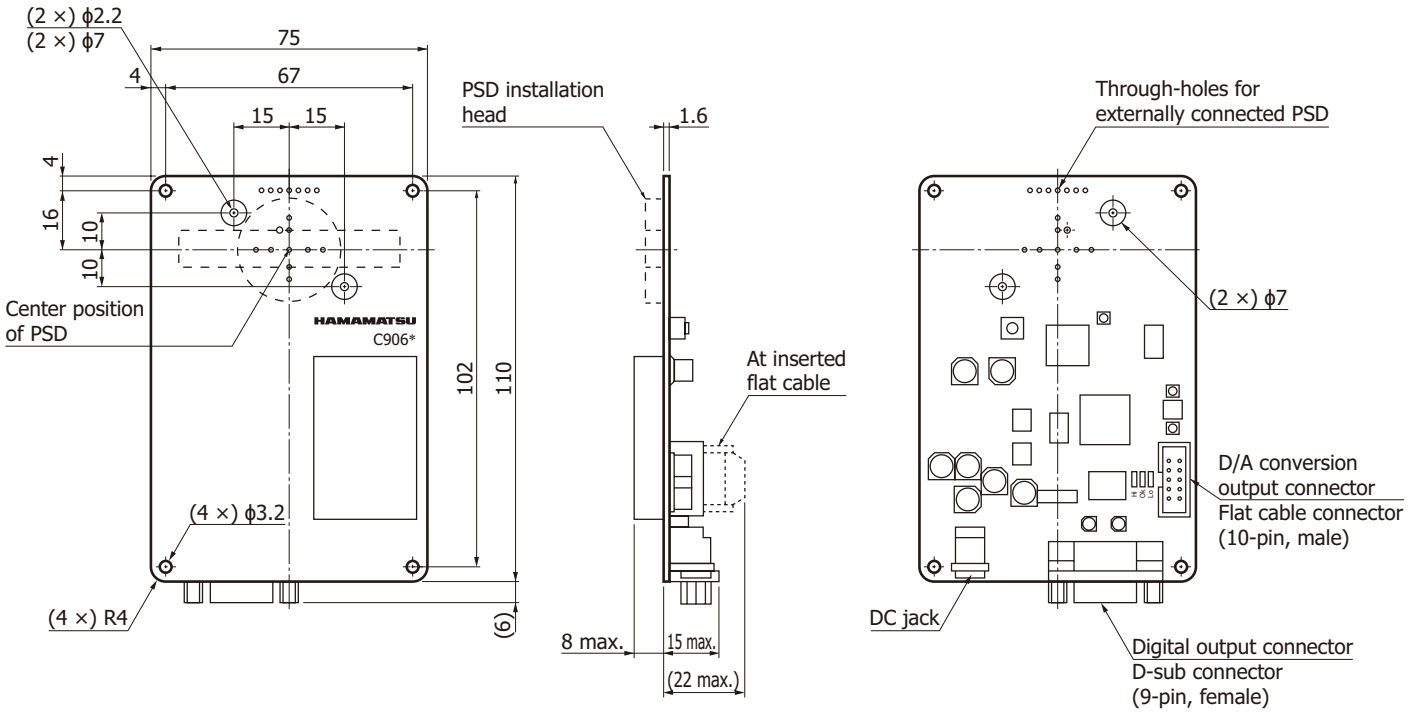
Accessory sample software display example (C9069-01)

Position data is displayed in numerical values and graphs.
Compatible OS: Microsoft® Windows® 10 Pro (32-bit, 64-bit)



Note: Microsoft, Windows, and Excel are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries.

Dimensional outline (unit: mm)



Tolerance unless otherwise noted: ±0.3

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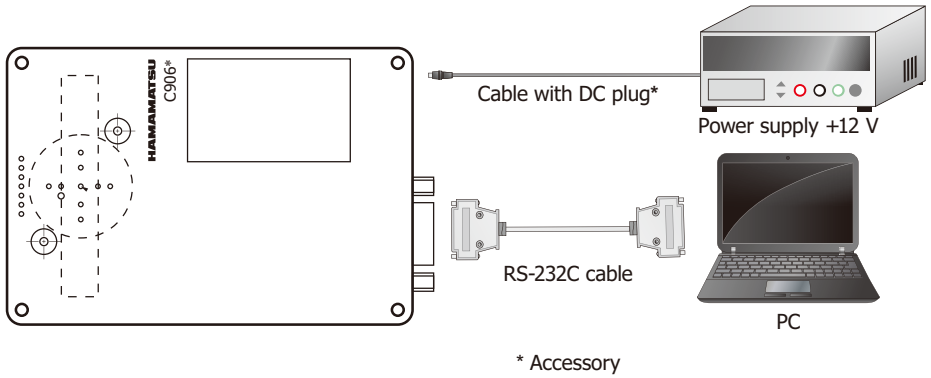
Connection example



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Accessories

· Instruction manual
· Sample software (CD-ROM)
· Cable with DC plug
· Flat cable (48 cm) with connector for D/A conversion signal output
· Attachment board for S5990-01/S5991-01 (C9069-01 only)

Note: RS-232C cable is not supplied. Prepare an off-the-shelf cable (straight) with 9-pin D-sub connectors (male to female).

Related information

www.hamamatsu.com/sp/ssd/doc_en.html

■ Precautions
· Disclaimer

■ Technical notes
· PSD
· PSD signal processing circuits, PSD modules

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