OPTO MECHANICS

SCAN BLOCK

C10516

Compact scan head for easy assembly into a system

OVERVIEW

The C10516 scan block is an optical block that combines galvano scanners with a telecentric fθ (F-theta) lens designed for laser beam scanning in the visible range. Coupling the C10516 to other optical blocks allows forming a measurement system for laser scanning fluorescence microscopes, reflecting microscopes, and even confocal microscopes. The 21.5 mm diameter observation area allows making wide-range sample observations. High magnification images can be observed with a photomultiplier tube by attaching the scan block to the C-mount port of a commercially available microscope.

Left: Scan block main unit, Right: Control unit

APPLICATIONS

- **Laser scanning microscopes**
- **Confocal laser scanning microscopes**

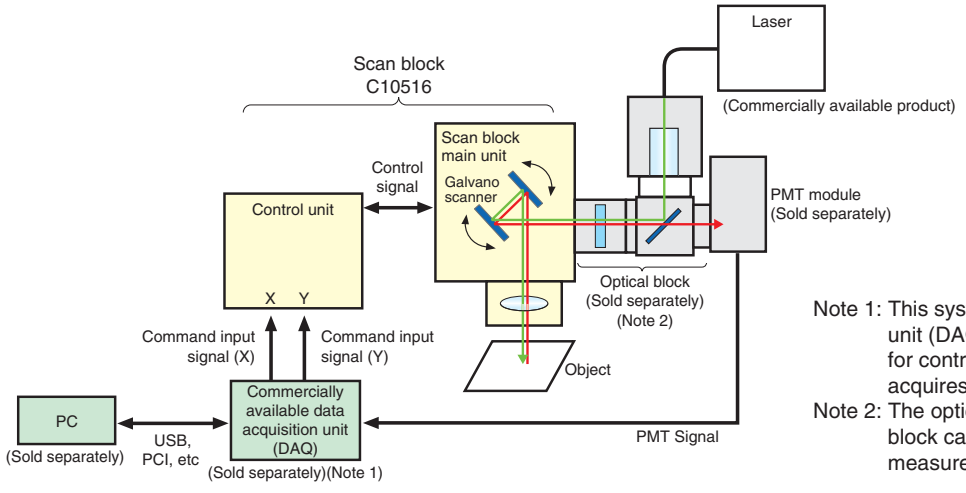
(Example) Biological microscopes
Industrial microscopes
DNA chip and protein chip readers

FEATURES

- **2D scan by two galvano scanners**
- **Contains a telecentric fθ (F-theta) lens**
- **Wide observation area of 21.5 mm diameter**
- **High-magnification observations in combination with a microscope objective lens**
- **Covers a wide spectral range**

CONFIGURATION

The C10516 consists of a scan block main unit and a control unit. Two galvano scanners and a telecentric fθ lens are built into the scan block main unit. The control unit contains a driver board for driving and controlling the galvano scanners.



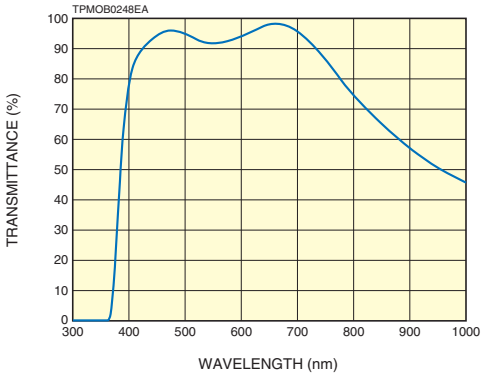
Note 1: This system requires a data acquisition unit (DAQ) that outputs analog signals for controlling the galvano scanners and acquires PMT signals.
Note 2: The optical blocks connected to the scan block can be changed according to the measurement purpose.

SPECIFICATIONS

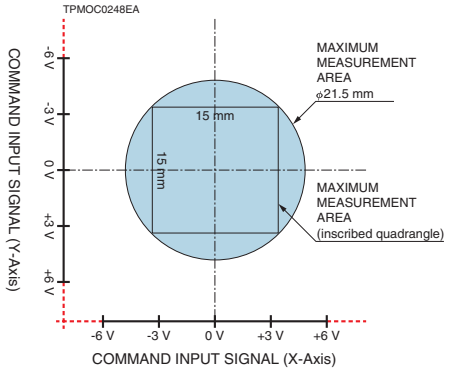
Items			Specifications	Units
Power input			AC100 to AC240	V
Power consumption		Max.	85	VA
Optical characteristics	Design wavelength Ⓐ		488 to 632	nm
	Transmittance (≥90 %)		440 to 720	nm
	Focal length		50	mm
	Maximum measurement area		ϕ21.5	mm
	Maximum measurement area (inscribed quadrangle)		15 × 15	mm
	Scan angle of maximum measurement area		±12.4	deg.
	Input beam aperture		ϕ4	mm
	Working distance		20	mm
	Resolution		80	Lp/mm
Galvano scanner characteristics	Maximum command input signal Ⓑ		±6	V
	Scan length per command input signal Ⓒ		2.5	mm/V
	Maximum scan speed		400	Hz
	Fill fraction Ⓓ		≥70	%
Mirror characteristics	Coating		Al	—
	Damage threshold		100 to 150	W/cm²
Operating ambient temperature			0 to +45	°C
Storage temperature			-10 to +50	°C
Operating ambient humidity Ⓔ			Below 80	%
Storage humidity Ⓔ			Below 85	%

ⒶThe telecentric fθ lens is designed with three wavelengths (488nm, 532nm, 632nm).
ⒷVoltage supplied to the X and Y axis scanner signal input on the control unit.
ⒸScan length at the field-of-view position for command input signal voltage that is supplied to the galvano scanners.
ⒹPercentage of constant velocity movement zone where the galvano scanner enters the measurement area.
ⒺNo condensation

●Telecentric fθ lens transmittance



●Command input voltage and observation field of view

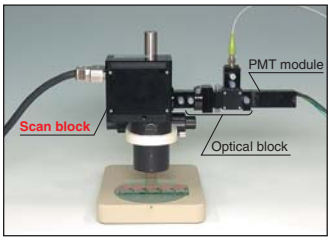


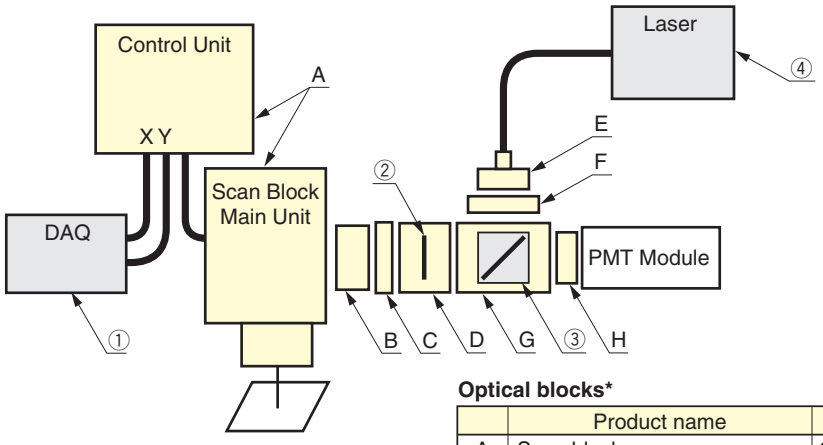
CONNECTION EXAMPLES

The optical system can be assembled by connecting the necessary optical blocks to the light input-output port on the scan block. The optical system connected to the scan block differs according to the object to be measured. Use the following examples as a general reference to connect optical blocks (sold separately) and commercially available optical components to the scan block.

①Reflected light detection

Attaching other optical blocks to the light input port of the scan block allows observations in an area of 15 mm × 15 mm.





Other manufacturers' products

	Product name
①	Data acquisition unit (DAQ)
②	Quarter-wave plate
③	Polarization beam splitter
④	Fiber output laser

Optical blocks*

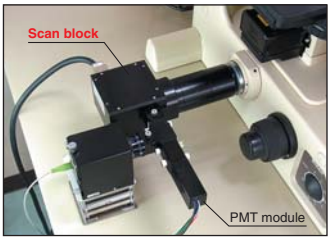
	Product name	Type No.	Qty
A	Scan block	C10516	1
B	C-mount adapter block	A10039	1
C	Joint block	A10038-01	1
D	Polarizer holder block	A11026	1
E	Fiber adapter block	A10037	1
F	Joint block	A10038-02	1
G	Beam splitter holder block	A10035-90	1
H	Adapter block	A10030-01	1

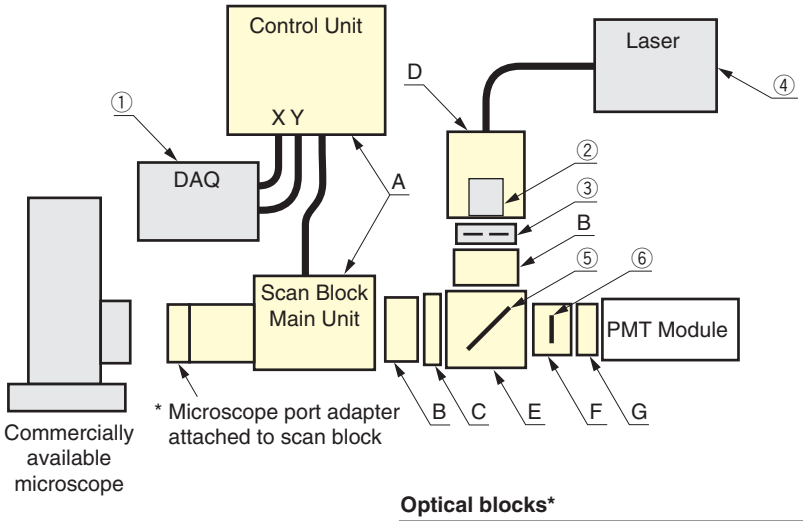
TPMOC0249EA

* Hamamatsu provides various types of optical blocks other than those listed in the connection examples.
Refer to our "Optical Blocks" catalog for more information.

②Fluorescence detection using scan block attached to microscope port

The scan block can be connected to the C-mount camera port of a commercially available microscope via the microscope port adapter that comes with the scan block. This system allows fluorescence image acquisition by laser scanning.





Other manufacturers' products

	Product name
①	Data acquisition unit (DAQ)
②	Infinity-corrected objective lens
③	Iris diaphragm barrel
④	Fiber output laser
⑤	Dichroic mirror
⑥	Filter

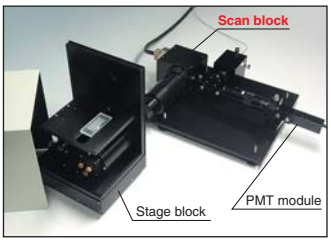
Optical blocks*

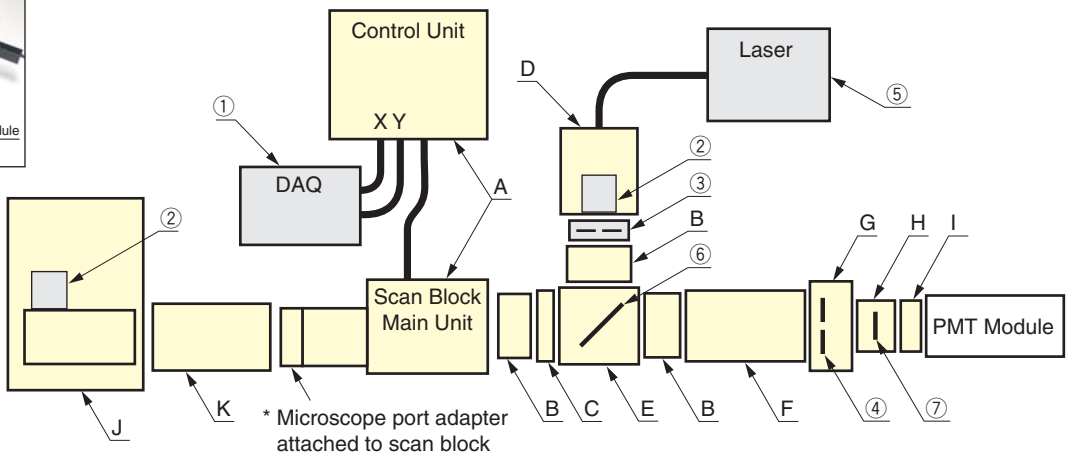
	Product name	Type No.	Qty
A	Scan block	C10516	1
B	C-mount adapter block	A10039	2
C	Joint block	A10038-01	1
D	Beam aligner block	A10760	1
E	Dichroic block	A10034-90	1
F	Filter block	A10033-90	1
G	Adapter block	A10030-01	1

TPMOC0250EA

③Fluorescence detection using confocal optical system

Using the scan block with a stage block and other optical blocks allows building a microscope system.





Other manufacturers' products

	Product name
①	Data acquisition unit (DAQ)
②	Infinity-corrected objective lens
③	Iris diaphragm barrel
④	Pinhole
⑤	Fiber output laser
⑥	Dichroic mirror
⑦	Filter for fluorescence

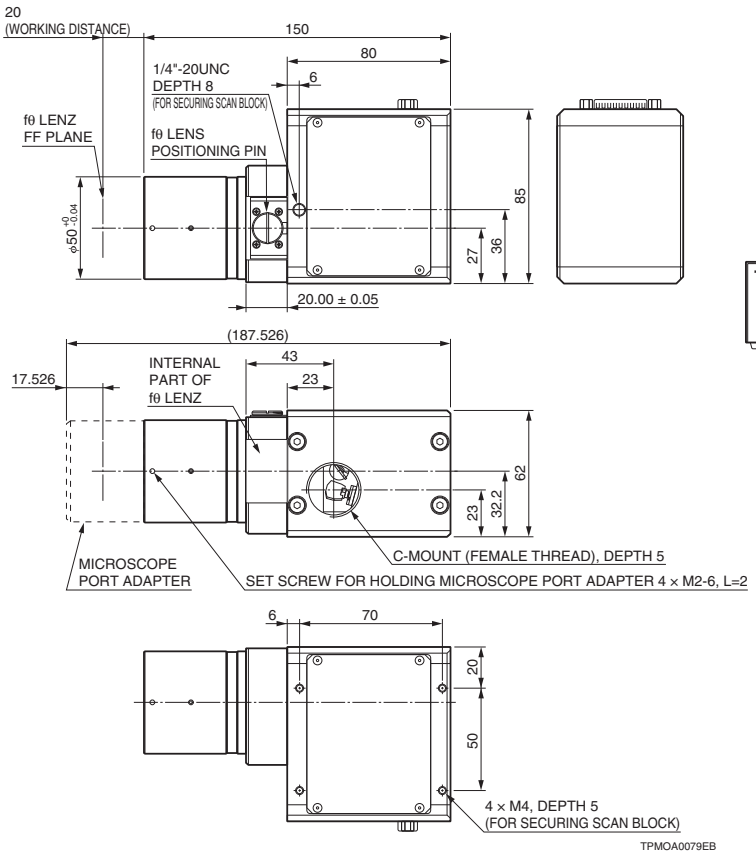
Optical blocks*

	Product name	Type No.	Qty
A	Scan block	C10516	1
B	C-mount adapter block	A10039	3
C	Joint block	A10038-01	1
D	Beam aligner block	A10760	1
E	Dichroic block	A10034-90	1
F	Tube lens block	A10859	1
G	Pinhole holder block	A11027	1
H	Filter block	A10033-90	1
I	Adapter block	A10030-01	1
J	Stage block	A10858	1
K	Tube lens block	A10859-01	1

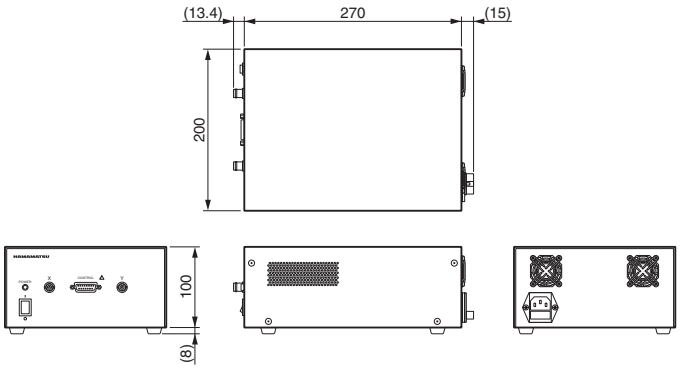
TPMOC0251EA

DIMENSIONAL OUTLINES (Unit: mm)

●Main unit



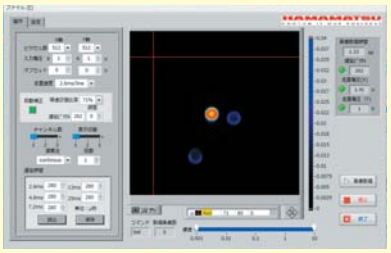
●Control unit



<RELATED PRODUCTS>

Sample software

Hamamatsu provides sample software for acquiring images using the scan block. This software was developed with National Instruments LabVIEW 2011 and so the software program was created assuming that a data acquisition unit (DAQ) of National Instruments is used. We also offer the program source free of charge to allow you to change the program or add functions as needed.



[Operating conditions] The following items must be installed:
LabVIEW 2011 or later
NI-DAQmx
NI-IMAQ 4.6.4 or later

Please contact us when you need this sample software.

Data acquisition unit (DAQ) (commercially available product)

A data acquisition unit (DAQ) is required to operate the scan block. Using a commercially available data acquisition unit (DAQ) helps you operate the scan block. Select the DAQ with specifications that match your application.

[Recommended specifications]

Number of analog input channels	Input resolution (bits)	Sampling rate (S/second)	Number of analog output channels	Output resolution (bits)	Output rate (S/second)	Simultaneous sampling	Digital I/O
1 or more ⓐ	12 or more	1 M or more	2	12 or more	1 M or more	ⓐ	ⓑ

ⓐWhen acquiring images from multiple channels, we recommend using a simultaneous sampling DAQ. If a multiplexer type is used, the acquired images will shift in time.
ⓑCounter input will be needed when using photon counting to acquire images.

HAMAMATSU PHOTONICS K.K. www.hamamatsu.com

HAMAMATSU PHOTONICS K.K., Electron Tube Division
314-5, Shimokanzo, Iwata City, Shizuoka Pref., 438-0193, Japan, Telephone: (81)539/62-5248, Fax: (81)539/62-2205

U.S.A.: Hamamatsu Corporation: 360 Foothill Road, Bridgewater, NJ 08807, U.S.A., Telephone: (1)908-231-0960, Fax: (1)908-231-1218 E-mail: usa@hamamatsu.com
Germany: Hamamatsu Photonics Deutschland GmbH.: Arzbergerstr. 10, D-82211 Herrsching am Ammersee, Germany, Telephone: (49)8152-375-0, Fax: (49)8152-265-8 E-mail: info@hamamatsu.de
France: Hamamatsu Photonics France S.A.R.L.: 19, Rue du Saule Trapu, Parc du Moulin de Massy, 91882 Massy Cedex, France, Telephone: (33)1 69 53 71 00, Fax: (33)1 69 53 71 10 E-mail: infos@hamamatsu.fr
United Kingdom: Hamamatsu Photonics UK Limited: 2 Howard Court,10 Tewin Road, Welwyn Garden City, Hertfordshire AL7 1BW, UK, Telephone: (44)1707-294888, Fax: (44)1707-325777 E-mail: info@hamamatsu.co.uk
North Europe: Hamamatsu Photonics Norden AB: Torshamnsgatan 35 16440 Kista, Sweden, Telephone: (46)8-509 031 00, Fax: (46)8-509 031 01 E-mail: info@hamamatsu.se
Italy: Hamamatsu Photonics Italia S.r.l.: Strada della Moia, 1 int. 6, 20020 Arese (Milano), Italy, Telephone: (39)02-93 58 17 33, Fax: (39)02-93 58 17 41 E-mail: info@hamamatsu.it
China: Hamamatsu Photonics (China) Co., Ltd.: 1201 Tower B, Jiaming Center, 27 Dongsanhuan Beilu, Chaoyang District, 100020 Beijing, China, Telephone: (86)10-6586-6006, Fax: (86)10-6586-2866 E-mail: hpc@hamamatsu.com.cn
Taiwan: Hamamatsu Photonics Taiwan Co., Ltd.: 8F-3, No.158, Section2, Gongdao 5th Road, East District, Hsinchu, 300, Taiwan R.O.C. Telephone: (886)03-659-0080, Fax: (886)03-659-0081 E-mail: info@hamamatsu.com.tw

TPMO1057E02
NOV. 2017 IP