Canon

FREE SPACE OPTICS

CANOBEAM

DT-55 DT-50 DT-30

Using Lasers to Connect Buildings Allows for a Low-Cost, High-Security, High-Speed Data Transmission Network.

Using Lasers to Connect Buildings Allows for a Low-Cost, High-Security, High-Speed Data Transmission Network.

The CANOBEAM series permits digital data transmission between two buildings located up to 2km apart with a direct line of sight between them, and supports a wide range of data transfer speeds, from 25Mbps to 1.25Gbps. In addition, the 3R function can be used to normalize the signal waveform in order to permit relay transmissions without deterioration of signal quality between buildings that are more than 2km* apart or that do not provide a good line of sight.

Furthermore, the CANOBEAM models DT-55 and DT-50 are equipped with an automatic tracking function that maintains beam alignment, compensating for changes in the installation base due to temperature variations and vibration due to wind. Because this feature always provides maximum power on the receiver, the unit is capable of highly reliable and stable communications.

- **High speed transmission up to 1.25Gbps**
- **Provides high-quality, reliable wireless communications up to 2km**
- **Requires no radio frequency allocations, permits or licenses**
- **Highly secure data links**
- **Protocol independent, like fiber optic cable**
- **Installation and operating cost are much lower than installing fiber optic cable**

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DT-55

- State-of -the -art bi-directional data transmission at 1.25Gbps for Gigabit Ethernet networks (1000Base-SX)
- Transmission distance 100 to 1000m
- Auto Tracking System
- 3R Function (Re-shaping, Re-timing, Re-generating)
- Constant footprint function
- Easy management with CMS (Canon Management Software)
- Optional SNMP management interface

DT-50

- Adaptable to a wide range of data transfer speeds from 25Mbps to 622Mbps by changing interface boards

Model Name	Data Transfer Speed
DT-50/DT-IF156	125Mbps/156Mbps
DT-50/DT-IF622	622Mbps
DT-50/DT-IFFM1	25Mbps-156Mbps (bit rate free)

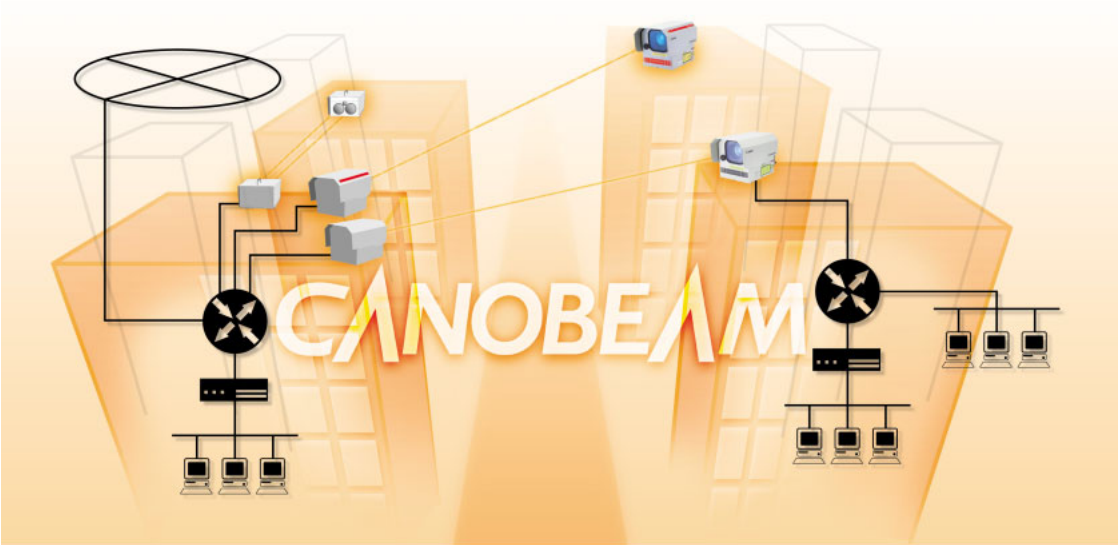
- Transmission distances up to 2 km*
- Auto Tracking System
- 3R Function** (Re-shaping, Re-timing, Re-generating)
- Constant footprint function
- Protocol independent
- Easy management with CMS (Canon Management Software)
- Optional SNMP management interface

DT-30

- Economical free space optics for data links up to 500 meters
- Wide range of data transfer speeds from 10Mbps to 156Mbps

Model Name	Data Transfer Speed
DT-30/MM	10Mbps-156Mbps (bit rate free, fiber optic input)
DT-30/TP	125Mbps (100Base-TX)

- Transmission distance 50 to 500m
- Standard integral "SNMP" management interface
- Protocol independent



* For DT-50/DT-IF622, the maximum distance is 1.5km. **Not available on DT-50/DT-IFFM1

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DT-55/50 Series

1. Bi-directional Gigabit speeds are possible with new wireless technology.
2. Auto tracking system assures best laser communication conditions.
3. Permits construction of a high-quality network in locations where a fiber optic network is not feasible.
4. Because the system uses laser light, it is free from radio interference and offers excellent security.
5. Requires no radio frequency allocation, permits or licenses.
6. Operating costs are limited to minor electricity and maintenance costs only.

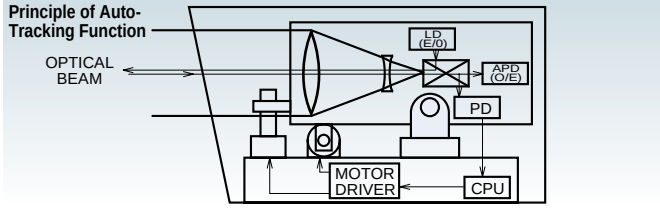
Accommodates a wide range of data transfer speeds

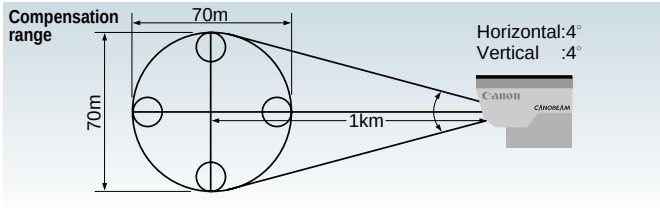
DT-55/50 series can handle a wide range of data transfer speeds from 25Mbps to an ultra-fast 1.25Gbps.
The user can select the transfer speed according to the type of network in which the unit will be installed.

Model Name	Data Transfer Speed
DT-55	1.25Gbps
DT-50/DT-IF156	125Mbps/156Mbps
DT-50/DT-IF622	622Mbps
DT-50/DT-IFFM1	25Mbps-156Mbps (bit rate free)

Automatically adjusts the laser axis, providing stable communication

The DT-55/50 is equipped with an automatic tracking function that adj usts the laser axis to compensate for slight movements in the building or installation base due to temperature variations, or vibration due to wind. A CPU calculates the point of maximum light input and controls the laser axis appropriately. With up to 4 degrees of compensation in both the horizontal and vertical planes, this technology allows for maximum link availability.



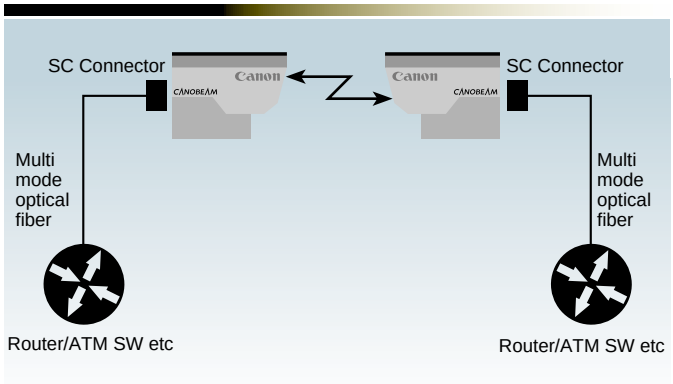


*Provides high-quality, reliable wireless communications up to 2km**

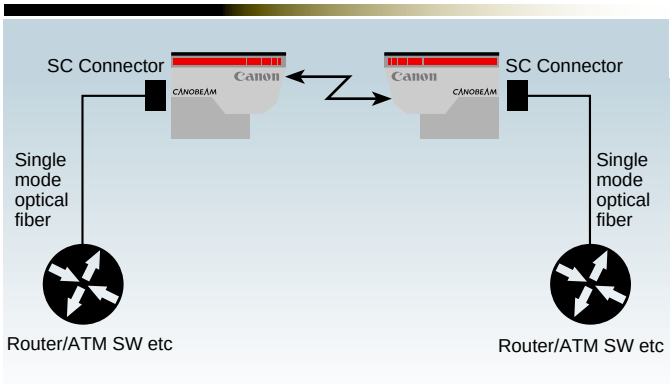
With an unobstructed line of sight and normal weather conditions, this laser network can provide instant, high-quality, highly reliable communications at a distance of up to 2km* .

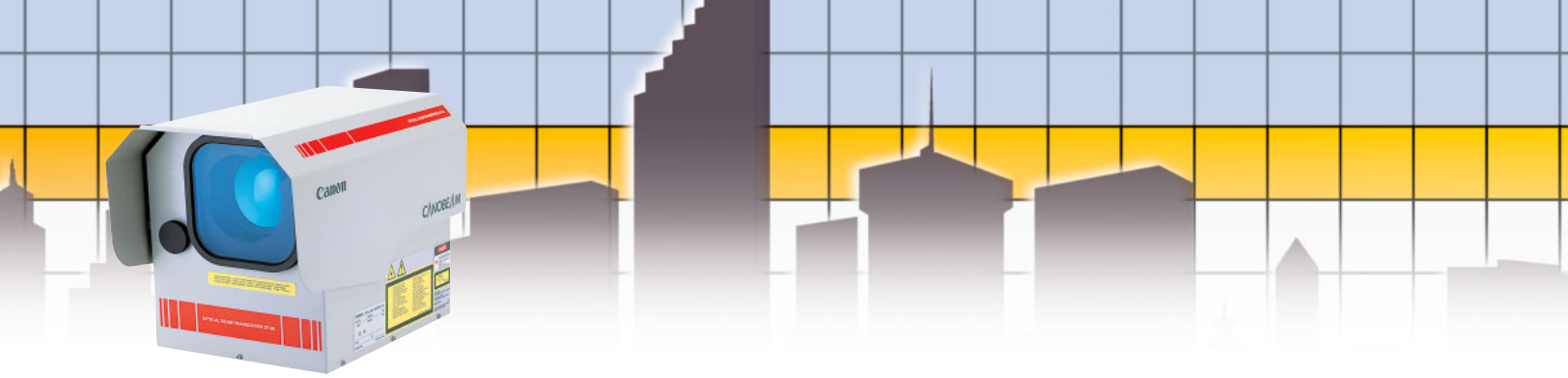
* For DT-55, the maximum distance is 1 km.
For DT-50/DT-IF622, the maximum distance is 1.5 km.

DT-55, DT-50/DT-IF156, DT-IFFM1 Connectivity Diagram



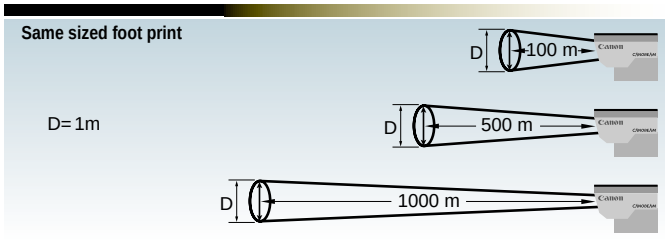
DT-50/DT-IF622 Connectivity Diagram

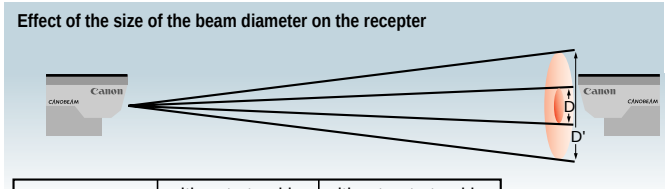




The constant footprint function ensures maximum optical power at the receiver

Canon' s knowledge and experience in the development and manufacturing of optical and laser technology have led to the creation of the constant footprint function.
This function ensures maximum optical power at the receiver. Other laser transceivers allow the beam to spread with distance, reducing the link availability in adverse weather conditions.





	with auto tracking	without auto tracking
Beam diameter	D= 1m	D' = 5m
Receiver power	1	1 / 25

3R Function**
(Re-shaping, Re-timing, Re-generating)

The 3R function can be used to normalize the signal waveform with Gigabit Ethernet, Fast Ethernet, FDDI, and ATM (156Mbps, 622Mbps) transmissions in order to permit relay transmissions without deterioration of signal quality between buildings that are more than 2km* apart or that do not provide a good line of sight.

* * Not available on DT-50/DT-IFFM1

"CMS" Canobeam Management Software

Proprietary Windows-based software which monitors the status of the DT-55/50 remotely is included. When an RS-232C cable is connected between the DT-55/50 and a PC, the status of the transceiver can be monitored and diagnostic logs can be stored in the PC.

(CMS Sample)

(Data Log Sample)

Time	Laser input level	Laser output level	Main signal input level	Intern temper ature
2002/08/10 00:00:11	67	67	92	22
2002/08/10 00:01:11	69	67	92	22
2002/08/10 00:02:11	65	67	93	2
2002/08/10 00:03:11	64	67	93	2
2002/08/10 00:04:11	64	67	92	
2002/08/10 00:05:11	65	67	92	
2002/08/10 00:06:11	67	67	92	
2002/08/10 00:07:11	63	67	92	
2002/08/10 00:08:11	62	67	93	
2002/08/10 00:09:11	65	67	93	
2002/08/10 00:10:11	63	67	92	

"SNMP" Interface board (Option)

SNMP(Simple Network Management Protocol) is optionally available for DT-55/50 with installation to DT-NICS card.

Specifications

CANOBEAM DT-55 and DT-50

Model Name	DT-55	DT-50/DT-IF156	DT-50/DT-IF622	DT-50/DT-IFFM1
Application	Gigabit Ethernet (*2) (1000Base-SX)	Fast Ethernet(*3), FDDI, ATM(OC3; 156Mbps)	ATM(OC12; 622Mbps)	25~156Mbps (bit rate free)
Standard Transmission Distance (*1)	100~1000m	100~2000m	100~1500m	100~2000m
Laser Wavelength	785±15nm			
Receiving Device	SiAPD			
Data Transfer Rate	1.25Gbps	125/156Mbps	622Mbps	25~156Mbps (bit rate free)
Auto-Tracking Adjustment	Yes (Horizontal: 4° Vertical: 4°)			
3R Function	Yes			
SNMP	Optional			
Physical Interface	Standard SC Connector (*4) Multi mode fiber cable	Standard SC Connector Multi mode fiber cable	Standard SC Connector Single mode fiber cable	Standard SC Connector Multi mode fiber cable
Operation Temperature Range	−20°C~+45°C			
Power	AC100~120V/230V(±10%) 50/60Hz (-48VDC optional−Please contact Canon office for more information)			
Power Consumption	approx.50W			
Dimensions	284(W)×332(H)×502(D)mm			
Weight	approx.17Kg			

(*1) Longer transmission distances can be achieved but this is a function of weather conditions and acceptable link availability.
(*3) Fast Ethernet requires fixed Full Duplex interface (without Auto-Negotiation)

Note:Please contact Canon office for details of the installation.
Depending on the installation environment, an additional sunvisor or snow shelter is recommended.

(*2) 1000Base-LX is optionally available. Please contact Canon office for more information.
(*4) Single mode fiber cable is optionally available. Please contact Canon office for more information.

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DT-30

1. DT-30 accommodates a wide range of data transfer speeds from 10Mbps to 156Mbps.
2. Standard integral management capabilities via SNMP and Telnet.
3. Permits construction of a high-quality network in locations where a fiber optic network is not feasible.
4. Because the system uses laser light, it is free from radio interference and offers excellent security.
5. Requires no radio frequency allocation, permits or licenses.
6. Operating costs are limited to minor electricity and maintenance costs only.

Wide range of data transfer speeds:10Mbps to 156Mbps

The DT-30 can handle a wide range of data transfer speeds from 10Mbps to 156Mbps. The DT-30/MM(Multi-mode Fiber input) is bit rate free and needs no adj ustments to interface with your network, whether it is FDDI or ATM as long as the bit rate is 10Mbps to 156Mbps. The DT-30/TP (Twist-Pair input) handles 125Mbps for Fast Ethernet use.

Model Name	Data Transfer Speed
DT-30/MM	10Mbps ~156Mbps(bit rate free)
DT-30/TP	125Mbps(100Base-TX)

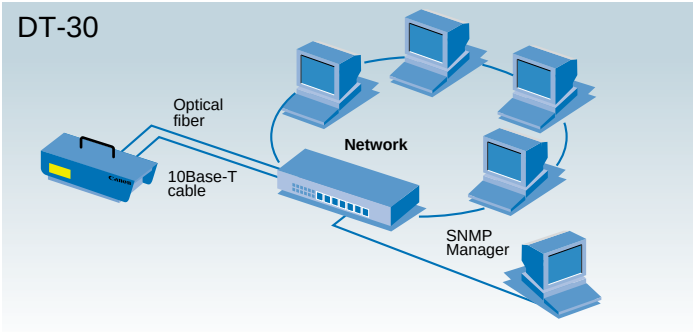
Provides high-quality, reliable wireless communications up to 500m

With an unobstructed line of sight and normal weather conditions, this laser network can provide instant, highly reliable communications at a distance up to 500m.

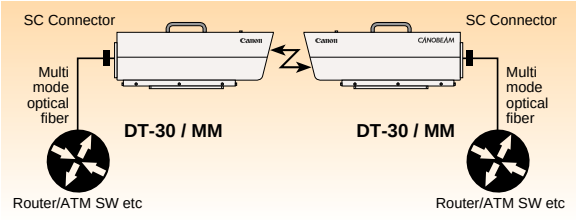
Standard integral management by SNMP

Because the DT-30 supports SNMP (Simple Network Management Protocol), the network manager can monitor and manage the operation of the transceivers at all times.

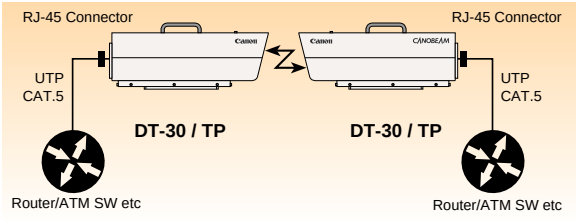
SNMP CONNECTION SAMPLE



DT-30 / MM Connectivity Diagram



DT-30 / TP Connectivity Diagram

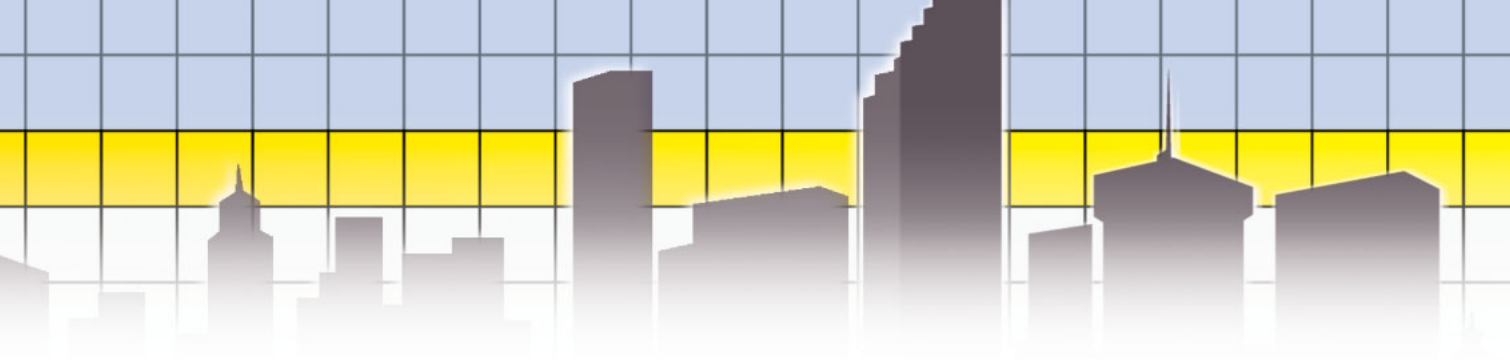


Specifications

CANOBEAM DT-30

Model Name	DT-30/MM	DT-30/TP
Application	ATM(OC3; 156Mbps), FDDI, Fast Ethernet(*2) (100Base-FX)	Fast Ethernet(*2) (100Base-TX)
Standard Transmission Distance (*1)	50~500m	
Laser Wavelength	785±15nm	
Receiving Device	SiAPD	
Data Transfer Rate	10~156Mbps (bit rate free)	125Mbps
Auto-Tracking Adjustment	—	
3R Function	Optional	—
SNMP	Built-in	
Physical Interface	Standard SC Connector Multi mode fiber cable	RJ45 Connector Twist Pair Cable (UTP Cat.5)
Operation Temperature Range	−20℃~+45℃	
Power	AC100~120V/230V(±10%) 50/60Hz (-48VDC optional−Please contact Canon office for more information)	
Power Consumption	approx.25W	
Dimensions	258(W)×204(H)×509(D)mm	
Weight	approx.9.2Kg	

(*1) Longer transmission distances can be achieved but this is a function of weather conditions and acceptable link availability.
(*2) Fast Ethernet requires fixed Full Duplex interface (without Auto-Negotiation)



Canobeam Q & A

Is performance affected by the weather?

It is unavoidable that an optical beam can be affected by weather conditions. Rain, fog or snow reduce visibility, scattering and attenuating the amount of laser light that passes between the two units. This can result in transmission errors, so a back up line is recommended. However, if it is possible to see half way to the opposite site under bad weather conditions, the DT-55/50 can transmit correctly.
With the DT-30 that does not feature Auto-tracking and the " constant footprint function" , the total distance of the link must be visible.

What happens if a bird flies across the path of the laser?

If a bird flies across part of the path of the laser, the amount of light that is received will be reduced, but will still be adequate enough for data transmission. However, if a bird flies near the source of the laser obstructing it completely, the data will be momentarily interrupted. But if you are using TCP/IP, the problem will be resolved by a retransmission of the data.

Is a relay setup possible?

If you want to set up a network connection between two buildings that are separated by more than 2km or that do not have a clear line of sight, you can connect pairs of CANOBEAM units to relay the signal. Because the waveform is normalized by the 3R function at each relay point, the data will not be damaged by the relay process. (The 3R function is available on the DT-55, DT-50/DT-IF156, and DT-50/DT-IF622 models).

Are the lasers safe?

The DT-55/50/30 contains a class1M laser. The laser light that is output by the DT-55/50/30 is safe even if viewed with the naked eye at the point of output for a short period of time. Because the laser beam spreads out by the time it reaches the receiving side, it is even safer there than it is on the transmit side. (It is not recommended to use magnifying optics such as binoculars at the point of output, as the effect on the eyes would be amplified).

CDRH-class 1M, EN60825-1/A2:2001 class 1M

Is laser communication through glass windows possible?

Yes. The DT-55/50/30 can be installed indoors as long as the two units are located with a direct line of sight. However, some glass windows scatter and attenuate the amount of laser light. Therefore, conducting a field test is recommended.

What is the maximum transmission distance?

For DT-50/DT-IF156 or DT-50/DT-IFFM1, the standard transmission distance is from 100m to 2000m. For DT-50/DT-IF622 the standard transmission distance is from 100m to 1500m.
For DT-55, the standard transmission distance is from 100m to 1000m. For DT-30 series, the standard transmission distance is from 50m to 500m. However, maximum transmission distance is a function of weather conditions and acceptable link availability.

What are the physical connections to the Canobeam ?

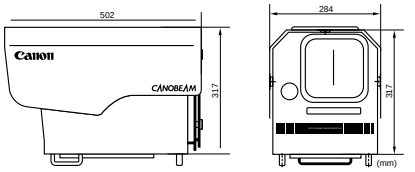
The DT-50/30 is protocol independent. The physical connection is as follows.

DT-55	Standard SC connector for multi mode fiber.(62.5/125µm or 50/125µm)
DT-50/DT-IF156	Standard SC connector for multi mode fiber.(62.5/125µm)
DT-50/DT-IFFM1	
DT-50/DT-IF622	Standard SC connector for single mode fiber.
DT-30/MM	Standard SC connector for multi mode fiber.(62.5/125µm)
DT-30/TP	RJ-45 connector for UTP CAT.5

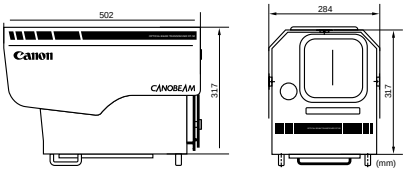
Which model is the most economical ?

The Model DT-30 is optimized for shorter links (up to 500 meters), at the shorter distances, a wide beam diameter (up to 3.5 meters) is permissible while ensuring reliable performance. Advanced auto-tracking and constant footprint technologies are not required.

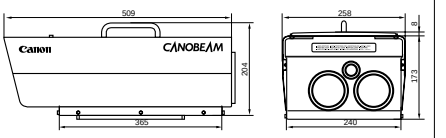
■ DT-55



■ DT-50



■ DT-30



OPTION FOR DT-55 / 50

Model Name	Description	Interface
DT-NICS	Interface Board for SNMP	10Base - T (multi-mode fiber optic interface optional—Contact Canon office for more information)

Classifications

	USA	Europe
Electrical	UL60950 (CSA60950)	EN60950
Laser Safety	21 CFR1040	IEC60825-1 IEC60825-2
Eye Safety	CDRH-class 1M	IEC-class 1M
EMC	FCC-Part 15 (ICES-003)	EN55081-1 EN55082-1

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