DATALOGIC AREASCAN DS1 Series Compact Multibeam Light Grid Instruction Manual

Contents

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DATALOGIC AREASCAN DS1 Series Compact Multibeam Light Grid

Product Information

- The DS1 Series is a light grid product that is used for object detection and measurement.
- It consists of a receiver (RX) and an emitter (TX) unit.
- The receiver unit has a yellow LED that indicates the presence of an object in the controlled area, while the green LED indicates the optimal functioning of the device. The emitter unit also has a green LED that indicates correct device functioning.
- It is important to align the receiver and emitter units parallel to each other, with their sensitive sides facing each other.
- The distance between the units should be within the device’s operating distance.
- The fast blinking of the green receiver LED indicates critical device alignment. The receiver and emitter units should be mounted on rigid supports using specific fixing brackets or the holes present on the device lids to avoid strong vibrations.
- When choosing and installing the device, consider the minimum object to detect and the maximum controlled area required.
- For agroindustrial applications, verify the compatibility of the light grid housing material with any chemical agents used in the production process with the assistance of the DATALOGIC technical sales support department.
- Note that the AREAscanTM light grids are not safety devices and must not be used for the safety control of machines.
- Avoid installing the device near intense or blinking light sources, especially near the receiver unit. Strong electromagnetic disturbances can also affect the correct functioning of the device.
- For correct object detection and measurement, ensure that the object passes completely through the controlled area. It is suggested to test the correct detection before beginning the process.
- The DS1 Series has various connections, including an analog output, a switching output, and a sync connection.
- The receiver unit has an M12 5-pole connector, while the emitter unit has an M12 4-pole connector.

- Shielded cables are not required for the standard connection, and a ground connection between the two units is not necessary. Both units should be powered by the same power supply with the same voltage reference.
- The DS1 Series can detect small objects with dimensions as small as 5 mm and can provide linear measurements with a 3 mm error in the best cases.
- The switching output is activated when at least one beam is obscured, and this status variation is indicated by the yellow receiver LED.

Product Usage Instructions

1. Position the receiver (RX) and emitter (TX) units parallel to each other, ensuring that their distance is within the device's operating distance.
2. Mount the receiver and emitter units on rigid supports using specific fixing brackets or the holes present on the device lids.
3. Choose the device according to the minimum object to detect and the maximum controlled area required.
4. Verify the compatibility of the light grid housing material with any chemical agents used in agroindustrial applications with the assistance of the DATALOGIC technical sales support department.
5. Avoid installing the device near intense or blinking light sources, especially near the receiver unit.
6. Ensure that both units have the same power supply and voltage reference.
7. Test the correct detection before beginning the object detection or measurement process.

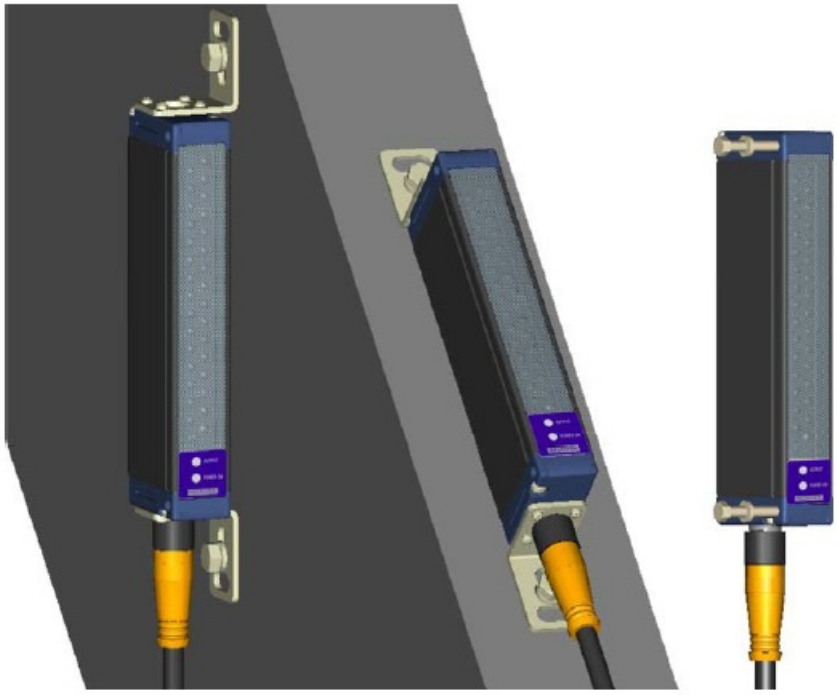
CONTROLS

- **OUT LED on the receiver (RX)**
  - The yellow LED ON indicates the presence of the object in a controlled area.
- **POWER ON LED on receiver (RX)**
  - The green LED ON indicates the optimal device functioning.
  - The fast blinking of the green LED indicates a critical device alignment.
  - Please refer to the "DIAGNOSTICS" paragraph for other indications.
- **POWER ON LED on emitter (TX)**
  - The green LED ON indicates the correct device functioning.
  - Please refer to the "DIAGNOSTICS" paragraph for other indications.

INSTALLATION MODES

General information on device positioning

- Align the two receivers (RX) and emitter (TX) units, verifying that their distance is inside the device operating distance, in a parallel manner, placing the sensitive sides one in front of the other, with the connectors oriented on the same side. The critical alignment of the unit will be signaled by the fast blinking of the green receiver LED.



- Mount the receiver and emitter units on rigid supports which are not subject to strong vibrations, using specific fixing brackets and /or the holes present on the device lids.

Precautions to respect when choosing and installing the device

- Choose the device according to the minimum object to detect and the maximum controlled area requested (= operating distance x controlled height);
- In agroindustrial applications, the compatibility of light grid housing material and any chemical agents used in the production process has to be verified with the assistance of the DATALOGIC technical sales support department;
- The AREAscanTM light grids are NOT safety devices, and so MUST NOT be used in the safety control of the machines where installed.

Moreover, the following points have to be considered:

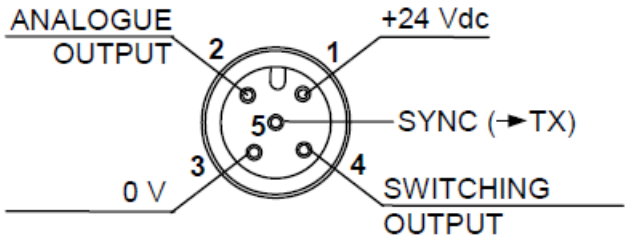
- avoid installation near very intense and/or blinking light sources, in particular near to the receiver unit;
- the presence of strong electromagnetic disturbances can condition the correct functioning of the device; this condition has to be carefully evaluated and checked with the DATALOGIC technical sales support department;
- the presence of smoke, fog, and suspended dust in the working environment can reduce the operating distance of the device;
- strong and frequent temperature variations, with very low peak temperatures, can generate a thin condensation layer on the surfaces of the optics, compromising the correct functioning of the device; reflecting surfaces near the luminous beam of the AREAscanTM device (above, under or lateral) can cause passive reflections able to compromise object detection inside the controlled area. if different devices have to be installed in adjacent areas, the emitter of one unit must not interfere with the receiver of the other unit.

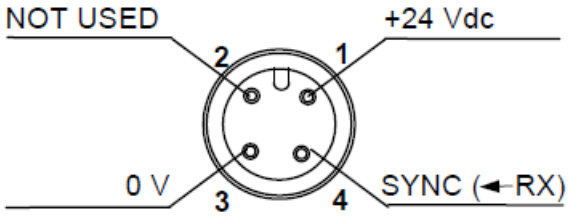
General information relative to object detection and measurement

- For correct object detection and/or measurement, the object has to pass completely through the controlled

area; testing the correct detection before beginning the process is suggested.

CONNECTIONS

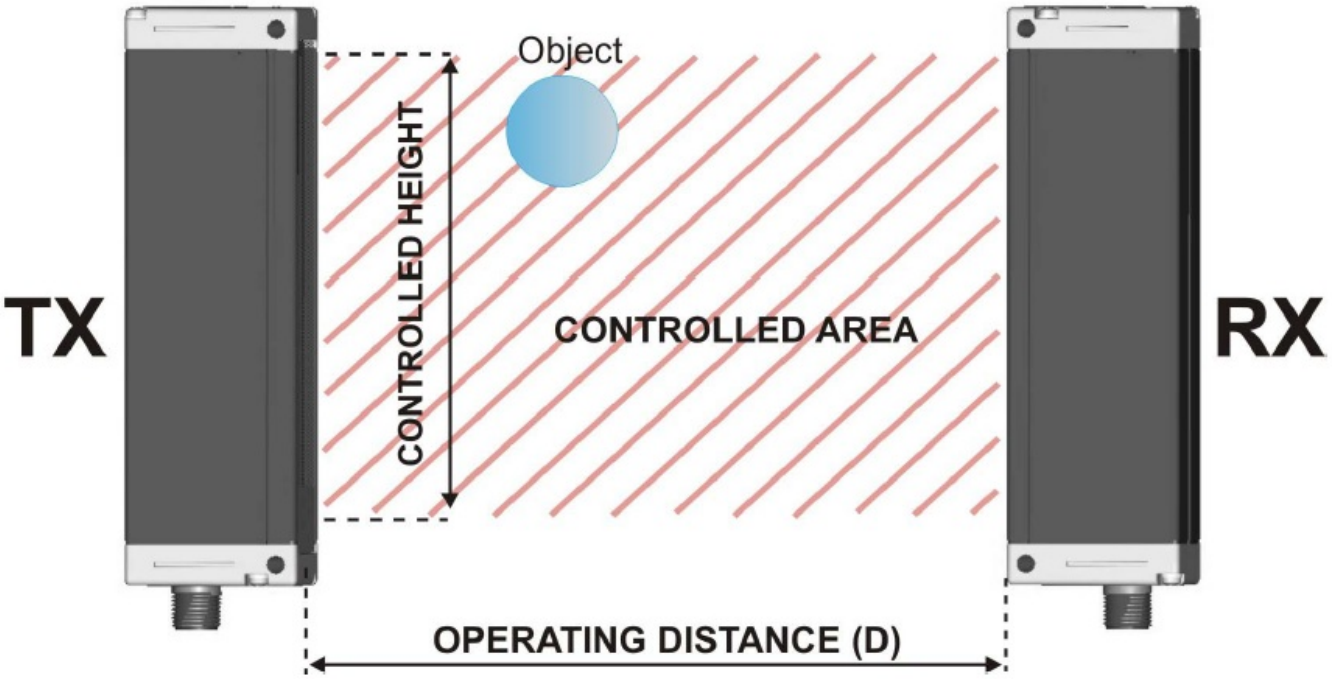




RECEIVER (RX) ***:*** M12 5-pole con nector	1 – brown :	+24 Vdc	***EMITTER (TX):*** M12 4-pole con nector	1 – brown :	+24 Vdc
	2 – white:	Analogue output		2 – white:	Not used
	3 – blue:	0 V		3 – blue:	0 V
	4 –black:	Switching output		4 – black:	SYNC
	5 – grey:	SYNC			

- Shielded cables are not foreseen in the standard connection
- Ground connection of the two units is not necessary
- Use the same power supply for both units: for a correct functioning it’s necessary that both units TX and RX have the same voltage reference 0V

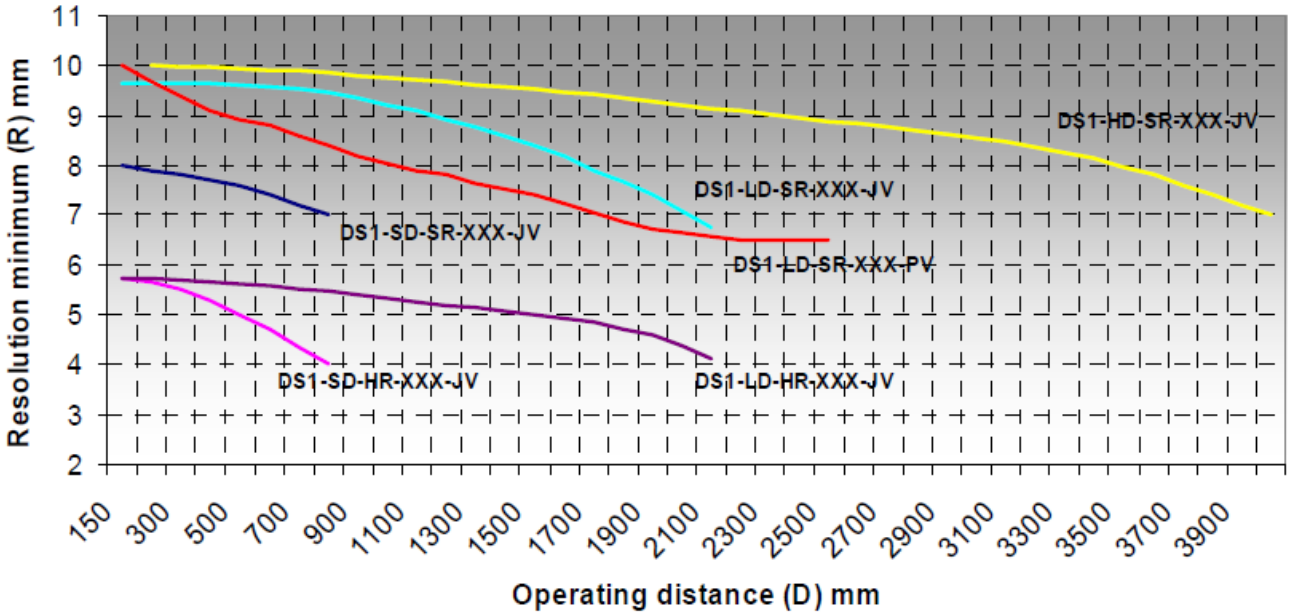
FUNCTIONING AND PERFORMANCES



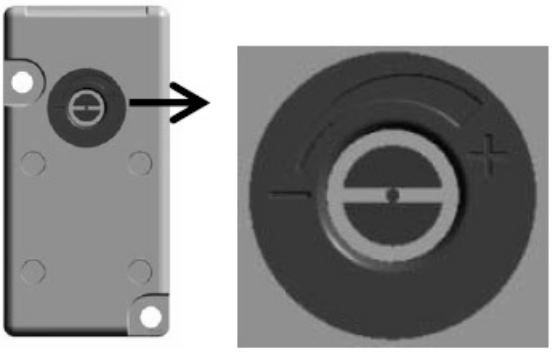
- The beam interruption due to the passage of an object inside the controlled area caused the closing of the switching output and the variation of the device’s analog output signal.
- Small objects can be detected (reaching dimensions of only 5 mm) and determine linear measurements with a

3 mm error in best cases.

- In particular, the switching output is always activated when at least one beam is obscured. The status variation is signaled by the yellow receiver LED that turns on.
- The analog output value (0-10 V) is proportional to the number of obscured beams (0V means that no beam is interrupted, and 10V all beams are interrupted)
- The device does not require calibration; periodical checks of the resolution and/or measurement are however suggested.
- The blinking of the green receiver LED (stability function) signals the critical alignment of the units and/or the functioning outside or near the maximum operating distance. In optimal conditions, the LED remains on continuously.
- The two units are synchronized via cable (SYNC wire); precarious connections or induced disturbances on the synchronism line can cause device malfunctioning or temporary blocking.
- The diagrams, given below, show the typical minimum resolution trend of each model, SR (standard resolution) and HR (high resolution), according to the operating distance (D).
- For DS1-LD-SR-XXX-PV, the minimum resolution at a particular operating distance is to be intended with the trimmer calibrated near the commutation threshold for that distance.



EMISSION POWER REGULATION (only DS1-LD-SR-XXX-PV)



The emitter is equipped with a trimmer which lets the user change the emission power. The operating distance increases rotating the trimmer clockwise. The emission power reduction is useful to decrease passive reflections when the maximum operating distance is not required. Trimmer rotation is limited to 260°. Do not apply a torque greater than 35 Nmm. Rotate the trimmer clockwise to the limit (maximum emission), then align RX and TX at the required operating distance (LED OUT off); decrease emission power by rotating the trimmer

counterclockwise until the output switches (LED OUT off) or the limit is reached (minimum emission); in the first case, rotate the trimmer clockwise until the output switches again and LED OUT remains off.

TECHNICAL DATA

Power supply:	24 Vdc ± 15%
Consumption on emitting unit (TX):	150 mA max.
Consumption on receiving unit (RX):	50 mA max without load
Switching output:	1 PNP output
Switching output current:	100 mA; short-circuit protection
Output saturation voltage:	£ 1.5 V at T=25 °C
Analog output:	0-10V proportional to obscured beams
Analog output current:	10 mA max. (1KW minimum resistive load)
Minimum resolution:	refer to the "*Specifications*" table
Measurement precision:	± 3.5 mm (refer to "*Specifications*" table)
Response time:	1 ms (refer to "*Specifications*" table)
Indicators:	**RX:** OUT LED (yellow) / POWER ON LED (green) **TX:** POWER ON LED (green)
Operating temperature:	0…+ 50 °C
Storage temperature:	-25…+ 70 °C
Operating distance (typical values):	**DS1-SD-XX-XXX-JV**: 0.15…0.8 m **DS1-LD-XX-XXX-JV**: 0.15…2.1 m **DS 1-LD-SR-XXX-PV**: 0.20…2.5 m **DS1-HD-XX-XXX-JV**: 0.20…4.0 m
Emission type:	Infrared (880 nm)
Vibrations:	0.5 mm amplitude, 10 … 55 Hz frequency, for every axis (EN60068-2-6)
Shock resistance:	11 ms (30 G) 6 shock for every axis (EN60068-2- 27)

Housing material:	Black electro-painted aluminium
Lens material:	PMMA
Mechanical protection:	IP65 (EN 60529)
Connections:	M12 4-pole connector for TX M12 5-pole connector for RX
Weight:	300 g. (DS1-xx-010-xx) 400 g. (DS1-xx-015-xx) 600 g. (DS1-xx-030-xx)

DIAGNOSTICS

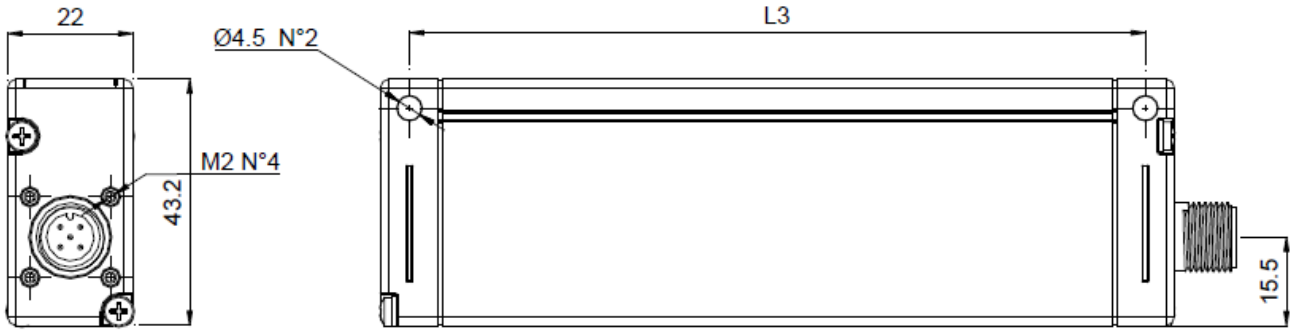
RECEIVING UNIT (RX):

Segnal	Status	Cause	Action
 *OUT LED*	**ON**	Switching output. Presence of the object in the controlled area.	
	OFF	Switching output. Controlled area free of objects.	
 *POWER ON LED*	**ON**	Optimal functioning	
	Fast blinking	Critical alignment of the unit or/and functioning closed to maximum operating distance.	
	Slow blinking	Wrong connections and/or malfunctioning.	- Verify the output connections and any short- circuits - Switch OFF and switch ON the device. - If condition persists, contact Datalogic.
	OFF	Device is not powered.	- Verify the connections. - If condition persists, contact Datalogic.

EMITTING UNIT (TX):

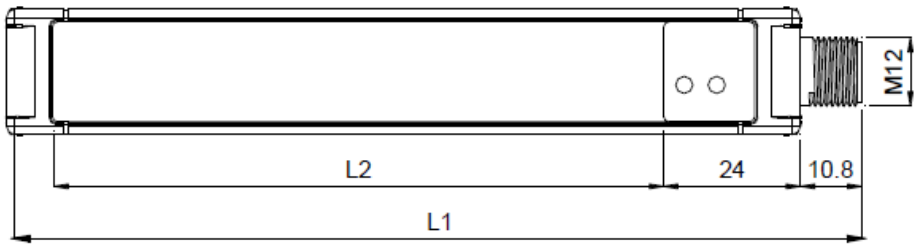
Segnal	Status	Cause	Action
 ***POWER ON LED***	**ON**	Normal functioning of emission unit.	
	Blinking	Unit malfunctioning	- Switch OFF and switch ON the device. - If condition persists, contact Datalogic.
	OFF	Absence of powering and/or synchronism with receiver	- Verify the connections and right value of power supply. - If condition persists, contact Datalogic.

DIMENSIONS

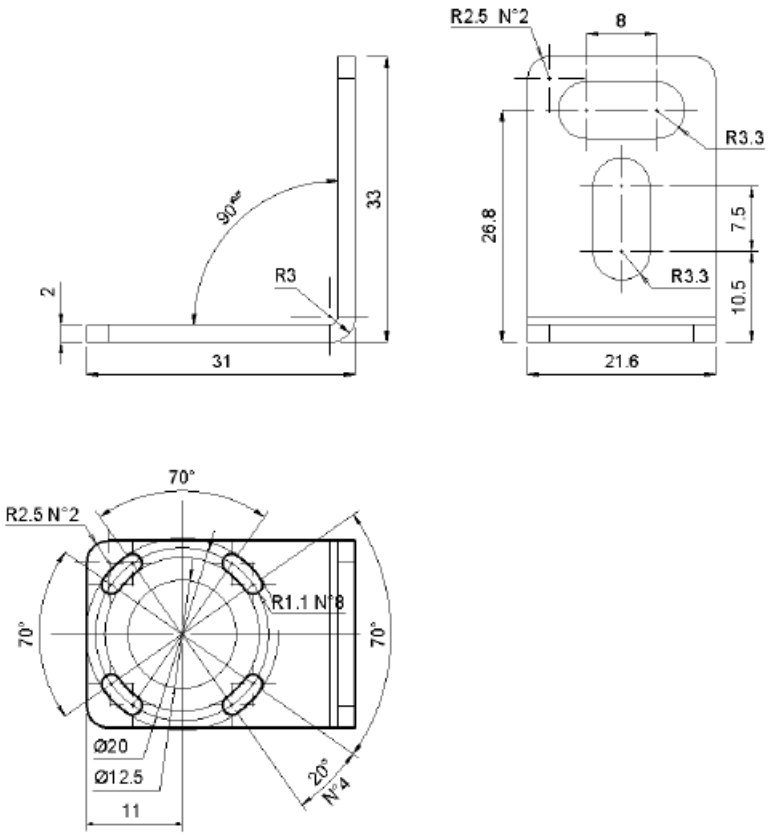


mm

	L1	L2	L3
DS1-010	150.1	107	129.1
DS1-015	200.1	157	179.1
DS1-030	350.1	307	329.1



FIXING BRACKET



The fixing bracket is supplied with the product.

SPECIFICATIONS

Model	Controlled height (mm)	N°. beams	Minimum resolution (mm)	Output analogue sensitivity (V)	Measurement precision (mm)	Response time (ms)	Operatine distance (m)
DS1-LD-HR-010-JV	100	32	5	0.31	±3.5	2	0.15...2.1
DS1-LD-HR-015-JV	150	48	5	0.21	±3.5	2.75	0.15...2.1
DS1-LD-SR-010-JV	100	16	7	0.63	±7	1	0.15...2.1
DS1-LD-SR-010-PV	100	16	7	0.63	±7	1	0.20...2.5
DS1-LD-SR-015-JV	150	24	7	0.42	±7	1.5	0.15...2.1
DS1-LD-SR-015-PV	150	24	7	0.42	±7	1.5	0.20...2.5
DS1-LD-SR-030-JV	300	48	7	0.21	±7	2.75	0.15...2.1
DS1-LD-SR-030-PV	300	48	7	0.21	±7	2.75	0.20...2.5
DS1-SD-SR-010-JV	100	16	7	0.63	±7	1	0.15...0.8
DS1-SD-SR-015-JV	150	24	7	0.42	±6	1.5	0.15...0.8
DS1-SD-SR-030-JV	300	48	7	0.21	±7	2.75	0.15...0.8
DS1-SD-HR-010-JV	100	32	4	0.31	±3	2	0.15...0.8
DS1-SD-HR-015-JV	150	48	4	0.21	±3	2.75	0.15...0.8
DS1-HD-SR-010-JV	100	16	7	0.63	±7	1	0.20...4
DS1-HD-SR-015-JV	150	24	7	0.42	±7	1.5	0.20...4
DS1-HD-SR-030-JV	300	48	7	0.21	±7	2.75	0.20...4

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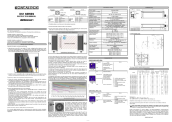
- Helpful links at www.datalogic.com.
- Contact Us, Terms and Conditions, Support.

- The warranty period for this product is 36 months. See General Terms and Conditions of Sales for further details.

Under current Italian and European laws, Datalogic is not obliged to take care of product disposal at the end of its life. Datalogic recommends disposing of the product in compliance with local laws or contacting authorized waste collection centers. 826003144 Rev.E

Documents / Resources

	DATALOGIC AREASCAN DS1 Series Compact Multibeam Light Grid [pdf] Instruction Manual DS1-HD-SR-030-JV, AREASCAN DS1 Series Compact Multibeam Light Grid, Compact Multibeam Light Grid, Multibeam Light Grid, Light Grid, Grid

References

- Datalogic | Automatic Data Capture and Industrial Automation - Datalogic
- Search - Manual-Hub.com