SPD1200N4

SOURCE-PRESERVING ENGINEERING REFERENCE



SPD1200N4 / SOURCE-PRESERVING USER MANUAL

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SECTION 01

Document Control and Source Coverage

Model SPD1200N4. Source manual issue: 2025.10. The supplied model DOCX is the only technical authority for this customer-facing English transcription.

All nine embedded source media items are inventoried in the internal QA record. Customer-visible derivatives change only language inside controlled overlay boxes; mechanical geometry and source dimensions are retained.

The source dimensions table states only 7.7 mm × 16.7 mm. No third dimension or complete 3D envelope is released in this manual.

The supplied legacy desktop source screenshot is archived in QA only. It is not published as an operational control interface because no executable or verified software behavior was supplied.

SOURCE ELEMENT	CUSTOMER PRESENTATION
Technical, pin, and protocol tables	Source-bound American English transcription
Mechanical figure	Model-specific source figure; no cross-model drawing
Optical-window and application figures	English text overlays on retained source geometry
Legacy desktop screenshot	QA archive only; not an operational claim

SECTION 02

Product Overview

The SPD1200N4 source describes a compact, high-accuracy 905 nm laser rangefinder module with UART-TTL communication. Its exact datasheet performance, dimensions, power, and environmental entries are retained in the controlled table below.

The source lists auxiliary ranging in handheld night-vision devices, thermal imagers, telescopes, and laser illuminators, plus civilian monitoring, aviation, communications, railway, road-monitoring, smart-water, and outdoor-sports scenarios. Suitability remains subject to the stated integration conditions and civilian-use boundary.

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SECTION 03

Technical Specifications

All values below are taken from the manufacturer datasheet.

NO.	PARAMETER	SPECIFICATION
1	Laser wavelength	905 nm ± 5 nm
2	Beam divergence	< 4.5 mrad
3	Optical material	Aspheric lens
4	Receiver aperture	Diameter 6.5 mm
5	Ranging distance	0.2 m–1200 m; maximum 1500 m (nighttime) Strong sunlight or low visibility may affect range.
6	Ranging accuracy	±0.3 m (d ≤ 100 m) ±0.3 m + d × 0.7‰ (100 m < d < 1200 m)
7	Measurement frequency	2–15 Hz or 4–15 Hz, adaptive
8	Valid measurement rate	≥ 98%
9	False-alarm rate	≤ 1%
10	Communication interface	UART-TTL; customizable
11	Baud rate	115200 bps (default)
12	Supply voltage	3.3–5 V
13	Startup time	≤ 200 ms
14	Operating power	Average ≈ 0.45 W; maximum ≤ 0.75 W
15	Operating temperature	−20 to +60 °C
16	Storage temperature	−30 to +70 °C
17	Protection rating	Lens chamber: IP67
18	Laser safety class	IEC Class I (per datasheet)
19	Dimensions	7.7 × 16.7 mm (square; only two dimensions given)
20	Weight	≈ 5 g
21	Shock	1000 g/ms (10 times/s along the optical axis)

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NO.	PARAMETER	SPECIFICATION
22	Vibration	5–50–5 Hz, 1 octave/min, 2.5 g
23	Reliability	MTBF ≥ 1500 h

SECTION 04

Functional Description

The complete module supports single and repeated measurements.

Single ranging: the source states that low-reflectivity targets may be measured repeatedly until stable distance data is obtained and reported through the serial interface in the defined format.

Repeated ranging: the source states that continuous distance measurement is supported; the narrative calls 2 Hz a typical configurable refresh rate and 15 Hz the maximum, while the technical table separately states 2–15 Hz or 4–15 Hz adaptive. The discrepancy remains unresolved.

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SECTION 05

Electrical Interface Definition

The six-pin order and signal directions below are specific to SPD1200N4.

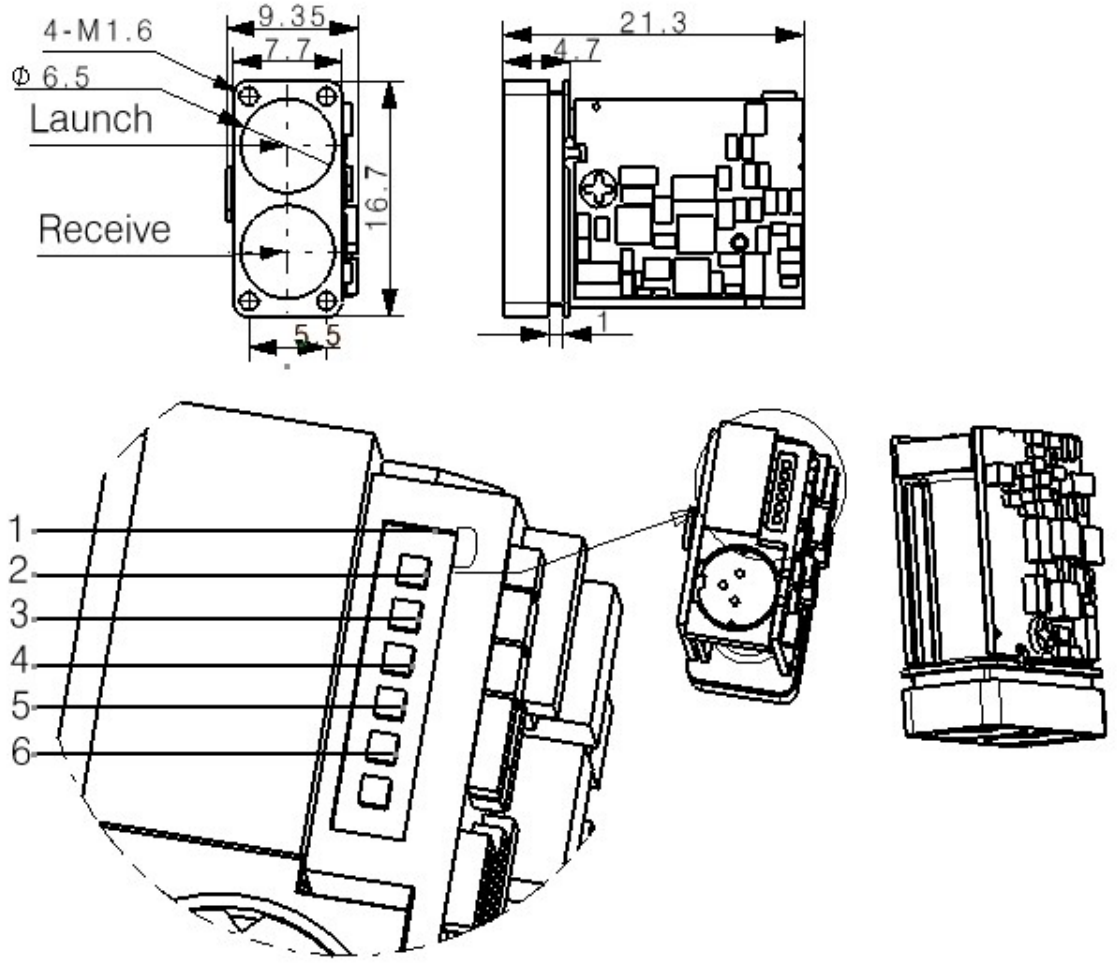
PIN	SIGNAL	FUNCTION
1	GND	Power ground
2	VCC	Positive supply
3	IO (reserved)	Reserved for expansion
4	TXD	Signal output: rangefinder module to host
5	RXD	Signal input: host to rangefinder module
6	SW-SHOT	Function enable (active HIGH) Source note: Compatible with an active-LOW control requirement

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SECTION 06

Mechanical and Pin-Callout Reference

Use only this model-specific source drawing. It retains the 7.7 mm × 16.7 mm front dimensions, 21.3 mm local side-view callout, 9.35 mm and 4.7 mm local dimensions, Diameter 6.5 mm aperture callout, four M1.6 mounting callouts, and physical pin callouts 1 through 6. The source technical table supplies only two overall dimensions; the drawing's local callouts must not be promoted into an inferred complete 3D envelope.



SPD1200N4 source mechanical and pin-callout figure — local callouts retained; no inferred third overall dimension; not for manufacturing.

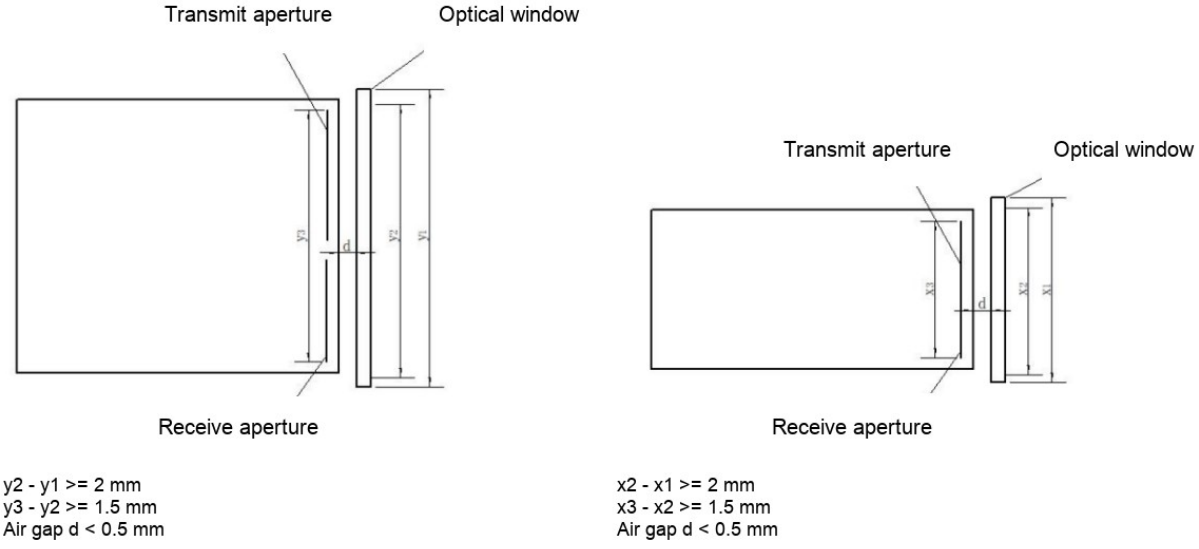
SECTION 07

Optical Window Recommendations

The source recommends H-K9L optical glass or fused silica, a wedge-angle tolerance of no more than 3 arcminutes, surface roughness Ra 0.012, an 855–955 nm anti-reflection coating with transmittance at least 99.5%, and source-referenced remaining requirements per GJB 2485-95 with transmittance at least 98%. These are source recommendations, not independent certification claims.

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The source recommends 2–4 mm window thickness, a transmit optical axis parallel to the window normal, and an air gap d < 0.5 mm. The source geometry and x/y variables are retained without geometric reinterpretation.



Source optical-window arrangements — English terminology overlay only; variables and dimensional relationships retained.

SECTION 08

Host Software Evidence Boundary

An embedded legacy screenshot exists in the source DOCX, but no standalone verified source screen, software binary, source code, release identifier, or connected-device evidence was supplied.

Accordingly, the source screenshot is archived in QA only; this manual does not publish it as an operational desktop/browser control or claim verified software behavior. The protocol transcription below is the only command authority in this release.

SECTION 09

Source Protocol Transcription

Source communication method: serial. Default baud rate: 115200 bps. Data bits: 8. Frame length: 8 bytes. All data is transmitted and received in hexadecimal.

The source uses different checksum scopes for request and reply frames. Preserve the exact source row order and verify checksum handling in the integration implementation.

The LD constant-ON reply row contains only the source marker 55. Source reply contains only 55; no complete reply frame may be inferred.

The four tables below provide a source-bound English transcription of all 35 non-title protocol rows. Consecutive duplicate cells caused by merged source cells are shown once per run.

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SOURCE ROW	SOURCE-BOUND ENGLISH TRANSCRIPTION
1	Frame headerH | Frame headerL | Function code | D1 | D2 | D3 | D4 | checksum
2	Request | 55 | AA | SUM(Function code+DATA1+…+DATA4)
3	Reply | 55 | AA | SUM(Frame headerH+Frame headerL+…+DATA4)
4	[Blank source separator row]

SOURCE ROW	SOURCE-BOUND ENGLISH TRANSCRIPTION
5	Ranging commands
6	Single ranging | Request | 55 | AA | 88 | FF | SUM[3: 7]
7	Single ranging | Request | 55 AA 88 FF FF FF FF 84
8	Single ranging | Reply | 55 | AA | 88 | STA | FF | DIS_H | DIS_L | SUM[1: 7]
9	Single ranging | Reply | STA = other, measurement failed; STA = 1:measurement succeeded DIS_H:High byte of the measurement result; DIS_L: Low byte of the measurement result Data is returned in hexadecimal, The returned hexadecimal value is the actual result multiplied by 10
10	Continuous ranging | Request | 55 | AA | 89 | FF | SUM[3: 7]
11	Continuous ranging | Request | 55 AA 89 FF FF FF FF 85
12	Continuous ranging | Reply | 55 | AA | 89 | STA | FF | DIS_H | DIS_L | SUM[1: 7]
13	Continuous ranging | Reply | STA = other, measurement failed; STA = 1:measurement succeeded DIS_H:High byte of the measurement result; DIS_L: Low byte of the measurement result Data is returned in hexadecimal, The returned hexadecimal value is the actual result multiplied by 10
14	Stop ranging | Request | 55 | AA | 8E | FF | SUM[3: 7]
15	Stop ranging | Request | 55 AA 8E FF FF FF FF 8A
16	Stop ranging | Reply | 55 | AA | 8E | STA | FF | SUM[1: 7]
17	Stop ranging | Reply | STA= 0Failed to stop continuous ranging; STA = 1Continuous ranging stopped successfully
18	Angle measurement | Request | 55 | AA | 8A | FF | SUM[3: 7]
19	Angle measurement | Request | 55 AA 8A FF FF FF FF 86
20	Angle measurement | Reply | 55 | AA | 8A | STA | FF | ANG_H | ANG_L | SUM[1: 7]

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SOURCE ROW	SOURCE-BOUND ENGLISH TRANSCRIPTION
21	Angle measurement | Reply | STA = 0measurement failed; STA = 1:measurement succeeded ANG_H:High byte of the measurement result; ANG_L: Low byte of the measurement result Data is returned in hexadecimal, The returned hexadecimal value is the actual result multiplied by 10 Valid only for a core equipped with an angle sensor
22	[Blank source separator row]

SOURCE ROW	SOURCE-BOUND ENGLISH TRANSCRIPTION
23	Power-on self-test
24	Self-test information | Reply | 55 | AA | 80 | STA | 00 | ErrCode | SUM[1: 7]
25	Self-test information | Reply | STA = 0 Power-on initialization failed, ErrCodeis the error code STA = 1 Power-on initialization succeeded
26	[Blank source separator row]

SOURCE ROW	SOURCE-BOUND ENGLISH TRANSCRIPTION
27	System settings
28	Baud rate | Request | 55 | AA | TYPE | FF | SUM[3: 7]
29	Baud rate | Request | TYPE = 01 Set baud rate to 9600 bps TYPE = 02 Set baud rate to 14400 bps TYPE = 03 Set baud rate to19200 bps TYPE = 04 Set baud rate to 38400bps TYPE = 05 Set baud rate to56000bps TYPE = 06 Set baud rate to 57600bps TYPE = 07 Set baud rate to 115200bps TYPE = 08 Set baud rate to 128000bps TYPE = 09 Set baud rate to 230400bps The baud-rate change is not applied immediately, It takes effect only after restart
30	Baud rate | Reply | 55 | AA | TYPE | STA | FF | SUM[1: 7]
31	Baud rate | Reply | STA = 0setting failed ; STA = 1 setting succeeded
32	LD constant-ON mode | Request | 55 | AA | 86 | FF | STA | SUM[3: 7]
33	LD constant-ON mode | Request | STA = 0,Disable LD constant-ON; STA = 1, Enable LD constant-ON 55 AA 86 FF FF FF 01 84 Enable 55 AA 86 FF FF FF 00 83 Disable
34	LD constant-ON mode | Reply | 55
35	LD constant-ON mode | Reply | STA = 0: enabled;STA = 1: disabled;STA = FF: operation failed Caution:Do not keep constant-ON mode enabled for a long period

SOURCE WARNING — Do not keep the LD constant-ON mode enabled for a long period.

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SECTION 10

Safety Warnings and Application Conditions

All laser-class, environmental, and application statements below are per datasheet and are not independent certification claims.

Do not look directly into the laser emission aperture. The source states compliance with Class 1.

Operate from −20 to +60 °C and avoid high temperature, humidity, rain, snow, or dust. Do not disassemble the module.

Primarily intended for civilian integration.

The source developer-only spot/beam adjustment mode must not be directed toward human eyes.

Ranging capability and response depend on target reflectivity, reflective area and shape, measurement angle, sunlight, water vapor, suspended particles, rain, fog, snow, and haze. Water surfaces or targets that do not produce adequate diffuse reflection may not be measurable.

For long-distance measurements, the source recommends fixing the module on a tripod to reduce movement.

WARNING Laser emission aperture: do not look directly into the emitted beam or aim the developer-only adjustment mode at anyone's eyes.



English warning equivalent preserving the role of the supplied warning graphic.

SECTION 11

Applications and Supplied Product Views

The source application figure identifies high-reflectivity highway signs, medium-reflectivity building walls, trees, and animals as example targets. Achievable range varies with target and environment; the figure is not a performance guarantee.

The compact galleries use only the external product views supplied with this model. No generic or cross-model imagery is substituted.

The single gallery retains all 7 supplied external source product views.

Supplied source video media is listed but not embedded: 849d35739b2cb49a0955b5fda7c86da9.mp4



English-cleaned source application figure — silhouettes retained without inferred performance values.



Supplied SPD1200N4 product views — compact source gallery.

SECTION 12

SOURCE DISCREPANCY — ENGINEERING CONFIRMATION REQUIRED

The following source discrepancies remain unresolved and are not normalized in this transcription.

1. The source dimensions list only 7.7 mm × 16.7 mm; do not add a third dimension or a complete 3D envelope.
2. The source frequency lower bound is ambiguous between 2 Hz and 4 Hz; retain the source wording without selecting one.
3. Keep SW-SHOT active-high wording and compatible active-low-control wording separate; do not claim two default logics.
4. Source reply contains only 55; no complete reply frame may be inferred.

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