

VCB-4001-SG-US Product Specification



DELTA Networks (Xiamen) LTD.

Version 1.3

2026-1-14

Revision History			
Version	Modify by	Description	Date
1.0	Steven.Li	Initial release	2025/7/18
1.1	Steven.Li	Update power consumption and operating temperature spec.	2025/8/1
1.2	wenhui.yang	Add pin definitions.	2025/9/30
1.3	Steven.Li	Add certification statement	2026/1/14

FCC Certification

Integration instructions for host product manufacturers according to KDB 996369 D03 OEM Manual v01r01

2.2 List of applicable FCC rules

The SUB-1G NODE is an SRD 904.4~924.4MHz FHSS module. It is within U.S. FCC part 15.247 standard

2.3 Specific operational use conditions

Operation Frequency: 904.4~924.4MHz

Modulation Type: 2GFSK

2.4 Limited module procedures

Not applicable; Single Modular Approval Request

2.5 Trace antenna designs

SUB-1G NODE is an SRD 904.4~924.4MHz FHSS module. It communicates with its antenna, which is External antenna with unstandard jack.

2.6 RF exposure considerations

To maintain compliance with FCC's RF Exposure guidelines, This equipment should be installed and operated with minimum distance between 20cm the radiator your body: Use only the supplied antenna.

2.7 Antennas

SUB-1G NODE is an SRD 904.4~924.4MHz FHSS module. It communicates with its antenna, which is External antenna with unstandard jack. Antenna Gain:3.02 dBi.

2.8 Label and compliance information

The final end product must be label in a visible area , the Host must Contains FCC ID: 2AMVP-VCB4001SG

2.9 Information on test modes and additional testing requirements

Data transfer module demo board can control the EUT work in RF test mode at specified test channel.

2.10 Additional testing, Part 15 Subpart B disclaimer

The module without unintentional-radiator digital circuit, so the module does not required an evaluation by FCC Part 15 Subpart B.

The host should be evaluated by the FCC Subpart B

2.11 OEM integration instructions:

This device is intended only for OEM integrators under the following conditions: The transmitter module may not be co-located with any other transmitter or antenna. The module shall be only used with the external antenna(s) that has been originally tested and certified with this module. As long as the conditions above are met, further transmitter test will not be required.

However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.).

2.12 Validity of using the module certification:

In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization for this module in combination with the host equipment is no longer considered valid and the FCC ID of the module cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

ATTENTION

This device is intended only for OEM integrators under the following conditions:

- 1) The antenna must be installed such that 20 cm is maintained between the antenna and users, and
- 2) This device and its antenna(s) must not be co - located with any other transmitters except in accordance with FCC multi - transmitter product procedures. Referring to the multi - transmitter policy, multiple transmitter(s) and module(s) can be operated simultaneously without C2PC.
- 3) For all products market in US, OEM has to limit the Operating Frequency: 904.4~924.4MHz by supplied firmware programming tool.

OEM shall not supply any tool or info to the end - user regarding to Regulatory Domain change.

USERS MANUAL OF THE END PRODUCT

In the user manual of the end product, the end user has to be informed to keep at least 20cm separation with the antenna while this end product is installed and operated. The end user has to be informed that the FCC radiofrequency exposure guidelines for an uncontrolled environment can be satisfied. The end user has to also be informed that any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment.

Caution

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter. NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures: -- Reorient or relocate the receiving antenna. Increase the separation between the equipment and receiver. -- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected. -- Consult the dealer or an experienced radio/TV technician for help.

To maintain compliance with FCC's RF Exposure guidelines, This equipment should be installed and operated with minimum distance between 20cm the radiator your body: Use only the supplied antenna.

FCC ID:2AMVP-VCB4001SG

ISED Statement

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

1. This device may not cause interference.
 2. This device must accept any interference, including interference that may cause undesired operation of the device.
- L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :
1. L'appareil ne doit pas produire de brouillage;
 2. L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

This equipment meets the exemption from the routine evaluation limits in section 6.6 of RSS-102. It should be installed and operated with a minimum distance of 20 cm between the radiator and any part of your body.

Cet équipement satisfait à l'exemption des limites d'évaluation de routine dans la section 6.6 de RSS-102. Il doit être installé et utilisé à une distance minimale de 20 cm entre le radiateur et n'importe quelle partie de votre corps.

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Appearance



Sub-1G

Operating Frequency Band	ISM 902-928MHz
Support Network Topologies	point-to-point, point-to-multipoint, peer-to-peer, and Mesh
Addressing Options	PAN ID and Addresses, Cluster IDs and Endpoints
Outdoor/RF Line-of-sight Range	Up to 500m, Theoretical Value
Transmit Power	100mW(+20dBm)
Receiver Sensitivity	-100dBm
RF Data Rate	40kbps(915 MHz, Theoretical Value), 100m Clearance Distance

Interface

SPI	1
Power	Input Votage: 3.3V±10% DC(Peak 0.5W)
Flash	4MB

Environment

Operating Temp.	-40℃~105℃
Storage Temp.	-40℃~105℃
Humidity	5% to 95% non-condensing

Mechanical

Dimensions	18.4*18.4*2.7mm
Package form	Stamp-type module
Weight	TBD
CASE Material	N/A

Packing List

PCBA	1
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Standards & Certifications

Safety&EMC	FCC ID,IC ID
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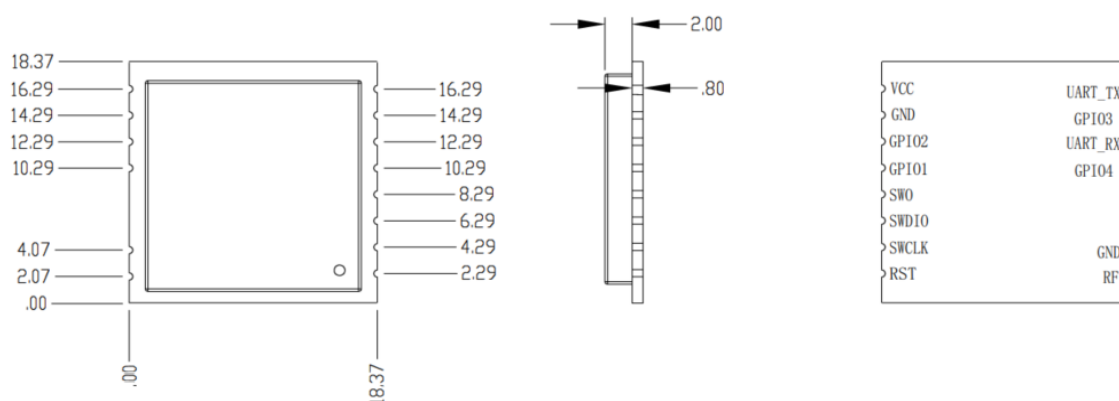
Reliability

MTBF	>200,000 hours @25 °C
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Warranty

Warranty	5 years
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Connector



P1	RST	Reset pin, high active
P2	SWCLK	SWD clock for internal debugging
P3	SWDIO	The SWD interface's serial data input/output pin, used for internal debugging.
P4	SWO	Trace output, used for internal debugging.
P5	GPIO1	General-Purpose Input/Output Pin,Functionally Configurable [Type:3.3V; Range:3.0~3.6V]
P6	GPIO2	General-Purpose Input/Output Pin,Functionally Configurable [Type:3.3V; Range:3.0~3.6V]
P7	GND	Power Ground
P8	VCC	Power VCC[Type:3.3V; Range:3.0~3.6V]
P9	UART_TX	UART Data Output
P10	GPIO3	General-Purpose Input/Output Pin,Functionally Configurable [Type:3.3V; Range:3.0~3.6V]
P11	UART_RX	UART Data Input
P12	GPIO4	General-Purpose Input/Output Pin,Functionally Configurable [Type:3.3V; Range:3.0~3.6V]
P13	GND	Power Ground
P14	RF	RF Output

Features And Highlights

***Wide Coverage, Strong Penetration, and Low Power Consumption:**

Utilizes Sub-1G technology to deliver stable and extended coverage in complex environments, significantly outperforming traditional solutions.

***High Density and Interference Resistance:**

Proprietary frequency hopping and channel avoidance technologies enable efficient spectrum usage and stable communication under high device density.

***Intelligent Mesh Networking:**

Based on a self-developed routing algorithm, nodes automatically establish optimal links, eliminate blind spots ("orphan nodes"), and support flexible network expansion.

***Reliable and Self-Healing Data Transmission:**

Each node supports local processing and storage, automatic time synchronization, and resume-from-breakpoint after recovery, ensuring data integrity.

***End-to-End Security:**

Proprietary identity authentication and encryption provide core security for data transmission.

***Simplified Operation and Maintenance:**

App and gateway integration enables one-click network setup, network health diagnostics, and detection of misconfigured or missing microinverters.

Ordering Information

VCB-4001-SG-US

Sub-1G Module