

AWiD 041533 Sentinel Sense Reader Module Instruction Manual

ADB-522

12/13/2023



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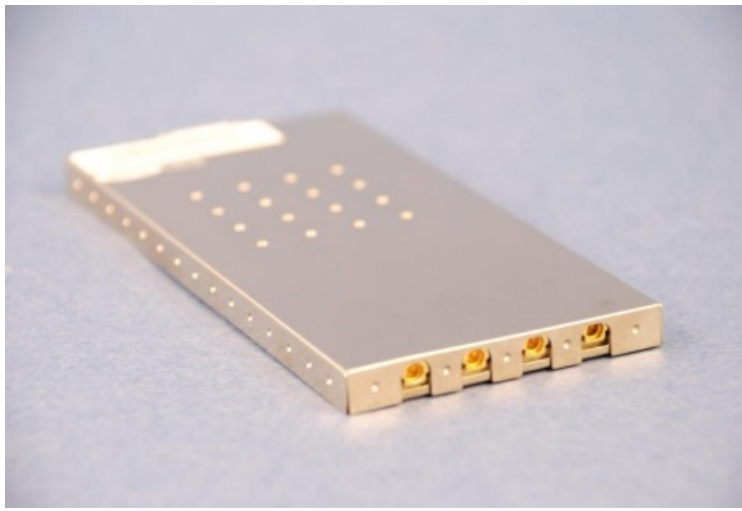
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SENTINEL-SENSE ADB-522

Installation & Operation Manual – 041533



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FCC COMPLIANCE

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 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 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.

FCC 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 transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 23 cm between the radiator & your body.

This module is intended for OEM integrators only. Per FCC KDB 996369 D03 OEM Manual v01 guidance, the following conditions must be strictly followed when using this certified module:

KDB 996369 D03 OEM Manual v01 rule sections:**2.2 List of applicable FCC rules**

This module has been tested for compliance to FCC Part 15.247

2.3 Summarize the specific operational use conditions

The module is tested for standalone mobile RF exposure use condition. Any other usage conditions such as co-location with other transmitter(s) or being used in a portable condition will need a separate reassessment through a class II permissive change application or new certification.

2.4 Limited module procedures

Not applicable.

2.5 Trace antenna designs

Not applicable.

2.6 RF exposure considerations

This equipment complies with FCC mobile radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 23 cm between the radiator & your body. If the module is installed in a portable host, a separate SAR evaluation is required to confirm compliance with relevant FCC portable RF exposure rules.

2.7 Antennas

The following antennas have been certified for use with this module; antennas of the same type with equal or lower gain may also be used with this module. The antenna must be installed such that 23 cm can be maintained between the antenna and users.

Manufacturer/ Brand	Model	Antenna Type	Antenna connector	Max Gain (dBi)	Impedance (Ω)
AWD	ANT-915CPS	Patch	TNC, RP	5.84	50
AWD	ANT-915-CP-R	Patch	SMA, RP	5.5	50
AWD	ANT-2012	Patch	SMA, RP	5.4	50
AWD	ANT-915-CC-05	Patch	TNC, RP	4.7	50

2.8 Label and compliance information

The final end product must be labeled in a visible area with the following: "Contains FCC ID: OGSADB512". The

grantee's FCC ID can be used only when all FCC compliance requirements are met.

2.9 Information on test modes and additional testing requirements

This transmitter is tested in a standalone mobile RF exposure condition and any co-located or simultaneous transmission with other transmitter(s) or portable use will require a separate class II permissive change re-evaluation or new certification.

2.10 Additional testing, Part 15 Subpart B disclaimer

This transmitter module is tested as a subsystem and its certification does not cover the FCC Part 15 Subpart B (unintentional radiator) rule requirement applicable to the final host. The final host will still need to be reassessed for compliance to this portion of rule requirements if applicable.

2.11 Host Guidance

Please follow the guidance provided for host manufacturers in KDB publications 996369 D02 and D04.

2.12 How to make changes

Only Grantees are permitted to make permissive changes. Please contact us should the host integrator expect the module to be used differently than as granted:

APPLIED WIRELESS IDENTIFICATIONS GROUP, INC. (AWID)
18300 Sutter Blvd, Morgan Hill, CA 95037
TEL: +1 (408) 825-1100, FAX: +1 (408) 782-7402

As long as all 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.

IMPORTANT NOTE: In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID 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.

Manual Information to the End User

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module.

The end user manual shall include all required regulatory information/warning as show in this manual.

OEM/Host manufacturer responsibilities

OEM/Host manufacturers are ultimately responsible for the compliance of the Host and Module. The final product must be reassessed against all the essential requirements of the FCC rule such as FCC Part 15 Subpart B before it can be placed on the US market. This includes reassessing the transmitter module for compliance with the Radio and EMF essential requirements of the FCC rules. This module must not be incorporated into any other device or system without retesting for compliance as multi-radio and combined

NOTE: READ AND USE THIS MANUAL.

NOTE: FAILURE TO FOLLOW THE INSTALLATION GUIDE MAY RESULT IN POOR PERFORMANCE OR EVEN CAUSE PERMANENT DAMAGE TO THE READER, THUS VOIDS THE PRODUCT WARRANTY.

Version No.	Revised By	Date	Sections Affected	Remarks
0.1	AWID Engineering	12/2023	–	Initial version
0.2	AWID Engineering	12/2023	FCC COMPLIANCE	Revision per Test Lab feedback

1 INTRODUCTION

AWID's Sentinel-Sense ADB-522 is a 4-port, long-range Radio Frequency IDentification (RFID) reader module with 3.3 V TTL logical interface that works with most leading UHF passive tags. The reader module comes with a unique combination of long read range, small size, and low power consumption. Its primary applications are asset management and tracking, and fleet management applications.

ADB-522 is delivered with Firmware Version such as US0-60.xx.xx.

In order to operate an ADB-522 you will need the following:

- PC running Windows¹ with serial (RS-232) interface
- Host software (AWID's demo software or your own custom software)

1.1 SPECIAL FEATURES

- Multi-Protocol: ISO-18000-6 Type C, EPC Class 1 Gen 2
- Thin passive tags with long-range performance
- 3.3 V (5.0V tolerable) Serial TTL logical interface

¹ Though this reader can also be controlled from a non-Windows programming platform, only Windows SDK and programs are provided by AWID.

2 SPECIFICATIONS

Input voltage	+5.8 VDC ~ 6 VDC (max)
Input current	1.4 A max @ +6VDC
Idle Power	0.5W in stand-by
Protocol language	ISO Type C, EPC Class 1 Gen 2
Read range	Depends on type & size of labels used
RF connectors	4xMMCX (F) VSWR<1.2 @50OHMs
Output power	+30 dBm max
Transmit frequency	902.60-927.40 MHz
Receiver frequency	902.60-927.40 MHz (Amplitude Modulated)
Hopping channels	125 Channels
Channel spacing	200 kHz typical
Hopping sequence	Pseudo random
Operating temperature range	-30° C to +65° C (-22° F to 149° F) (*)
Output data formats	3.3V TTL Serial
I/O Connector	10-pin ZIF
Dimension	2.11"x4.25"x0.35"

(*) depends on heat sink size

2.1 CHANNEL FREQUENCY TABLE

Frequency range: 902.60 ~ 927.40 MHz

Minimum number of frequency channels: 125

CH	902~928	MHz
0	902.60	MHz
1	902.80	MHz
2	903.00	MHz
3	903.20	MHz
4	903.40	MHz
5	903.60	MHz
6	903.80	MHz
7	904.00	MHz

8	904.20	MHz
9	904.40	MHz
10	904.60	MHz
11	904.80	MHz
12	905.00	MHz
13	905.20	MHz
14	905.40	MHz
15	905.60	MHz
16	905.80	MHz
17	906.00	MHz
18	906.20	MHz
19	906.40	MHz
20	906.60	MHz
21	906.80	MHz
22	907.00	MHz
23	907.20	MHz
24	907.40	MHz
25	907.60	MHz
26	907.80	MHz
27	908.00	MHz
28	908.20	MHz
29	908.40	MHz
30	908.60	MHz
31	908.80	MHz
32	909.00	MHz
33	909.20	MHz
34	909.40	MHz
35	909.60	MHz
36	909.80	MHz

37	910.00	MHz
38	910.20	MHz
39	910.40	MHz
40	910.60	MHz
41	910.80	MHz
42	911.00	MHz
43	911.20	MHz
44	911.40	MHz
45	911.60	MHz
46	911.80	MHz
47	912.00	MHz
48	912.20	MHz
49	912.40	MHz
50	912.60	MHz
51	912.80	MHz
52	913.00	MHz
53	913.20	MHz
54	913.40	MHz
55	913.60	MHz
56	913.80	MHz
57	914.00	MHz
58	914.20	MHz
59	914.40	MHz
60	914.60	MHz
61	914.80	MHz
62	915.00	MHz
63	915.20	MHz
64	915.40	MHz
65	915.60	MHz

66	915.80	MHz
67	916.00	MHz
68	916.20	MHz
69	916.40	MHz
70	916.60	MHz
71	916.80	MHz
72	917.00	MHz
73	917.20	MHz
74	917.40	MHz
75	917.60	MHz
76	917.80	MHz
77	918.00	MHz
78	918.20	MHz
79	918.40	MHz
80	918.60	MHz
81	918.80	MHz
82	919.00	MHz
83	919.20	MHz
84	919.40	MHz
85	919.60	MHz
86	919.80	MHz
87	920.00	MHz
88	920.20	MHz
89	920.40	MHz
90	920.60	MHz
91	920.80	MHz
92	921.00	MHz
93	921.20	MHz

94	921.40	MHz
95	921.60	MHz
96	921.80	MHz
97	922.00	MHz
98	922.20	MHz
99	922.40	MHz
100	922.60	MHz
101	922.80	MHz
102	923.00	MHz
103	923.20	MHz
104	923.40	MHz
105	923.60	MHz
106	923.80	MHz
107	924.00	MHz
108	924.20	MHz
109	924.40	MHz
110	924.60	MHz
111	924.80	MHz
112	925.00	MHz
113	925.20	MHz
114	925.40	MHz
115	925.60	MHz
116	925.80	MHz
117	926.00	MHz
118	926.20	MHz
119	926.40	MHz
120	926.60	MHz
121	926.80	MHz

122	927.00	MHz
123	927.20	MHz
124	927.40	MHz

Table 1 Channel Frequency Table for ADB-522

2.2 CONNECTOR PIN ASSIGNMENT

<u>Pin</u>	<u>Function</u>
1	Reserved
2	Reserved
3	Reserved
4	+6 VDC
5	+6 VDC
6	GND
7	Unit Enable (*)
8	SCIR
9	SCIT
10	GND

(*) Note: pin 7 is internally pulled high. User may leave this pin unconnected if manual control is not required

2.3 MEASURING READ DISTANCE

Make sure you know the tag types. For certain readers and tags, user must also be mindful of the tag's orientation and the reader's antenna orientation, what mounting surface the tags are designed for and how the tags are supposed to be mounted. Any departure from its intended purpose will drastically affect the reader's ability to energize the tag and its read range.

When measuring the reader's read range, make sure that the tag is properly oriented to the reader antenna, and for optimum performance, be sure the operator's finger is not within three (3) inches of the tag's antenna surface.

3 INSTALLATION & OPERATION GUIDELINES

For ease of explanation, MPR reader in this section refers to an RFID device that consists of ADB-522 and a high performance circular polarized antenna inside a splash proof, UV stabilized housing case. The module should be installed on a heat sink. Example of a heat sink could be an aluminum plate of size 8"x8"x0.1" exposed to convection air flow. The screws at the bottom of module shall be used for mounting the module on the heat sink.

3.1 GENERAL WIRING REQUIREMENTS

ADB-522 requires 10-pin flat flex cable (FFC) to connect from the supply source. Avoid using long (e.g., 10" or longer) cables when connecting the unit from the power supply source.

4 INSTALLATION PROCEDURE

This section provides installation and operation information for ADB-522 reader modules.

4.1 PARTS LIST

Verify that all items listed below are present before starting the installation.

o Sentinel-Sense ADB-522	Qty=1
o Documentation	Qty=1

4.2 PREPARATION FOR INSTALLATION

Familiarize yourself with the connectors and pin out assignment of each I/O connectors.

4.2.1 Bench Top Verification

It is always a good idea to verify system operation before committing to a full-scale installation. The following are the necessary steps to test the reader's operation in a static environment.

- Connect ADB-522 to the RS-232 port of a PC through the interface board provided in the demonstration kit
- Connect the power jack from the wall plug power supply to reader module
- Power up PC
- Install demo software on PC
- Activate demo software and verify performance of the reader.
- Select COM port 1 on top page then click "Connect". Follow with some commands.

5 SOFTWARE PROGRAMMING AND SYSTEM OPERATION NOTES

5.1 SYSTEM OPERATION

5.1.1 Running a Custom Software Application or the AWID Demo Program If AWID Demo Program is not used, it is expected user will launch a Custom Software Application developed using the MPR Communication Protocol and/or the supporting SDK (<http://www.awid.com> Support/Download) to issue commands to the MPR reader/module as specified.

5.2 USERS NOTE

For System Integrators and/or Software Developers

System Integrators and/or software developers should get familiar with the MPR Communication Protocol specifications and/or the supporting SDK for developing applications that control an ADB-522.

For Custom System Users

For custom system user, please refer to your host software user guide for information regarding system and software operations

For Demo Software Users

If you are using the AWID RFID demonstration software application which is .NET based with easy-to-follow GUI

operations, simply select the COM port for which the ADB-522 is configured then click “Connect” should get you started.

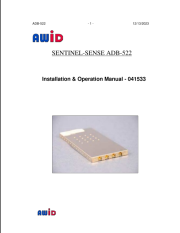
6 Reference

MPR Communication Protocol Manual - Doc# 041479




MPR Command Demo II Quick Reference Guide - Doc# 041483



Documents / Resources

	<p>AWiD 041533 Sentinel Sense Reader Module [pdf] Instruction Manual ADB512, ADB-522, 041533, 041533 Sentinel Sense Reader Module, Sentinel Sense Reader Module, Sense Reader Module, Reader Module, Module</p>
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References

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