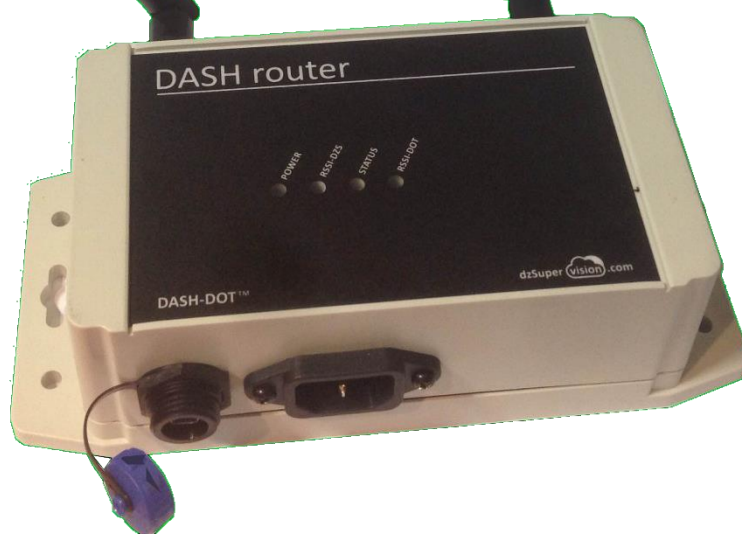


4i Platform Industrial IoT



DASH V3.X SERIES

Technical Manual

Brief

DASH V3.0 is the smart device that acts as a wireless gateway between one or more DOTs and the server. Store and forward technology built into DASH allows seamless communication even on poor wireless coverage areas.

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DASH V3.X SERIES

Features

- Internal 4GB memory for store and forward buffer.
- Remote configuration and control.
- Upgradeable firmware
- 100 – 240 VAC powered.
- Available in Wi-Fi and GPRS versions.
- IP 64 enclosure.
- Up to 5 DOTs at maximum sampling rate

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Specifications

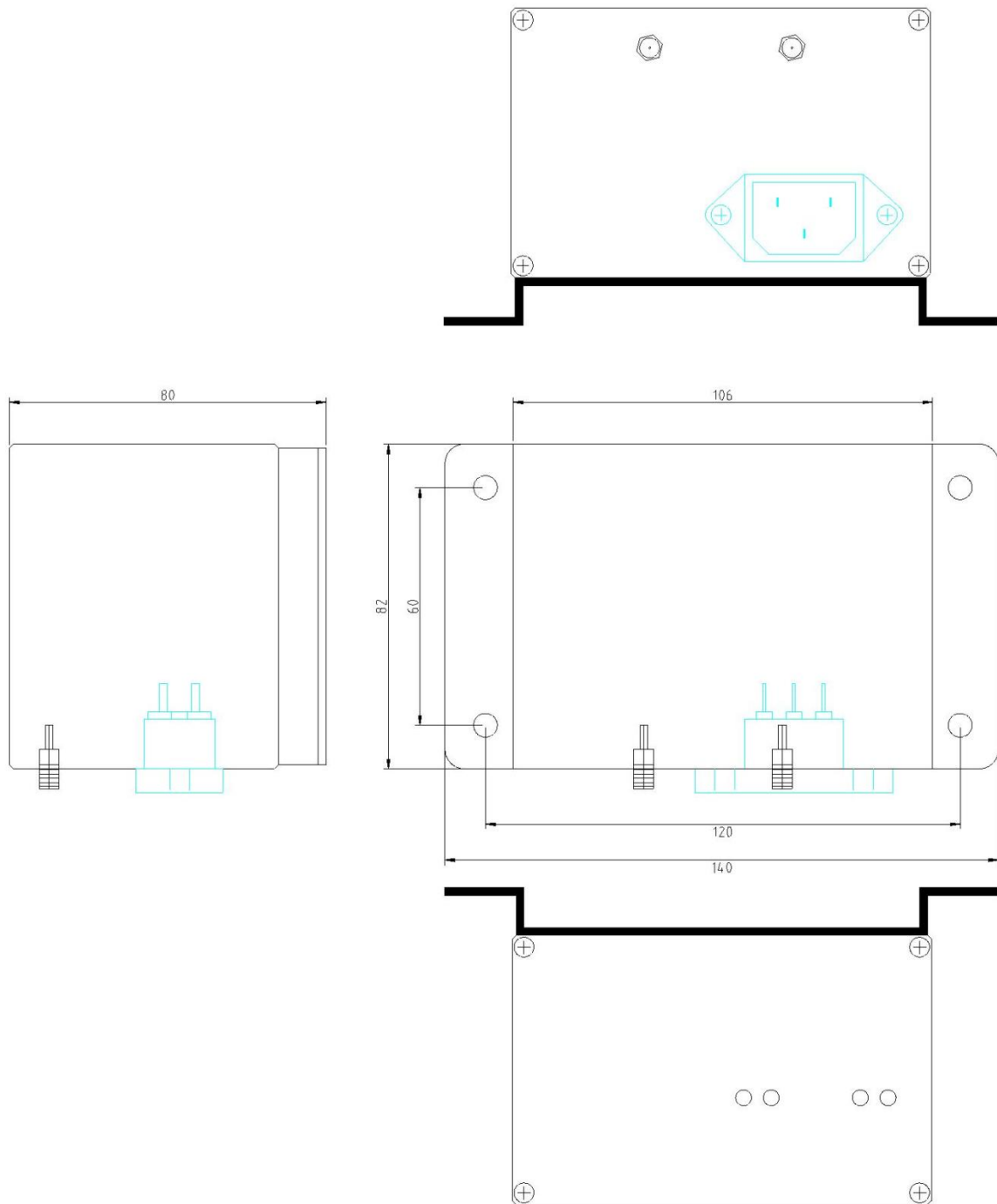
Parameter	Conditions	Min	Type	Max	Units
Frequency Band	WIFI	2.4	-	2.5	GHz
	GPRS	850 / 900 / 1800 / 1900			MHz
Reconnection Time(*)	After power down	30	45	60	Sec.
DOTs supported simultaneously	Maximum sampling rate	-	5	-	DOTs

Note: Reconnection time depends on the configuration and WIFI quality.

Electrical Characteristics

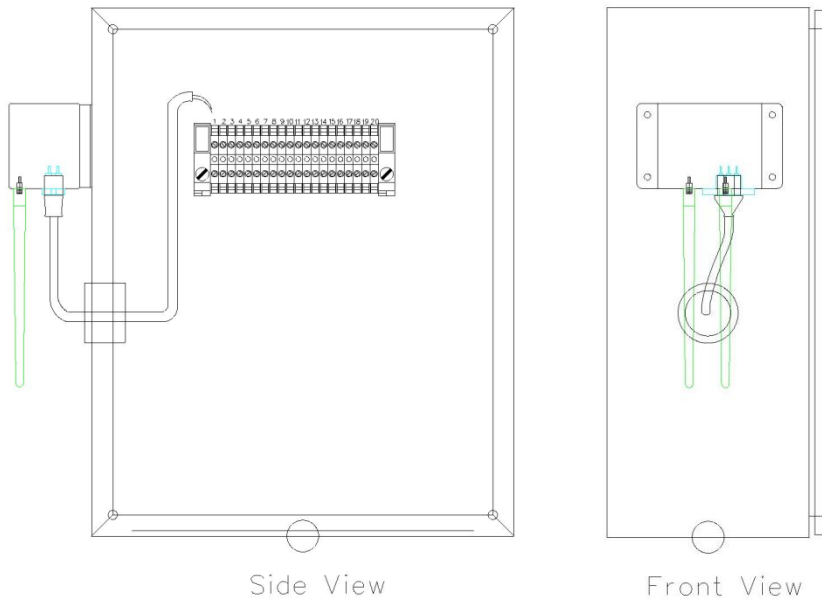
Parameter	Min	Typ	Max	Units
Operating Voltage(AC)	100	-	240	V
Operating Input Current	0.25	-	0.15	A

Physical Dimensions



Dimensions are in millimeters.

Panel Mounting Example

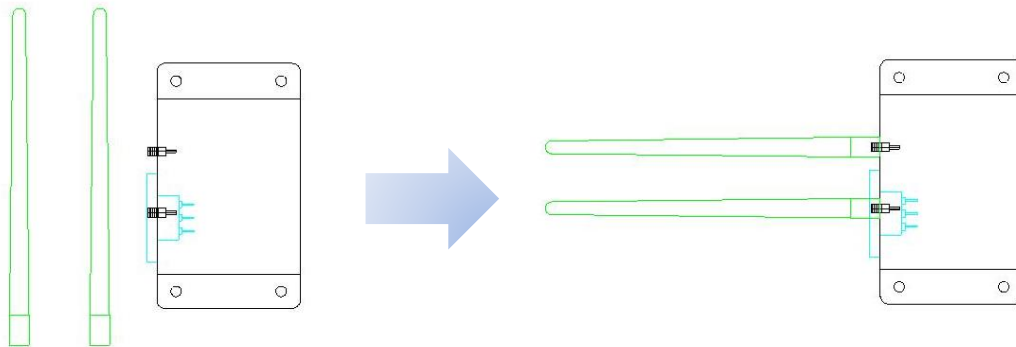


Installation Instructions

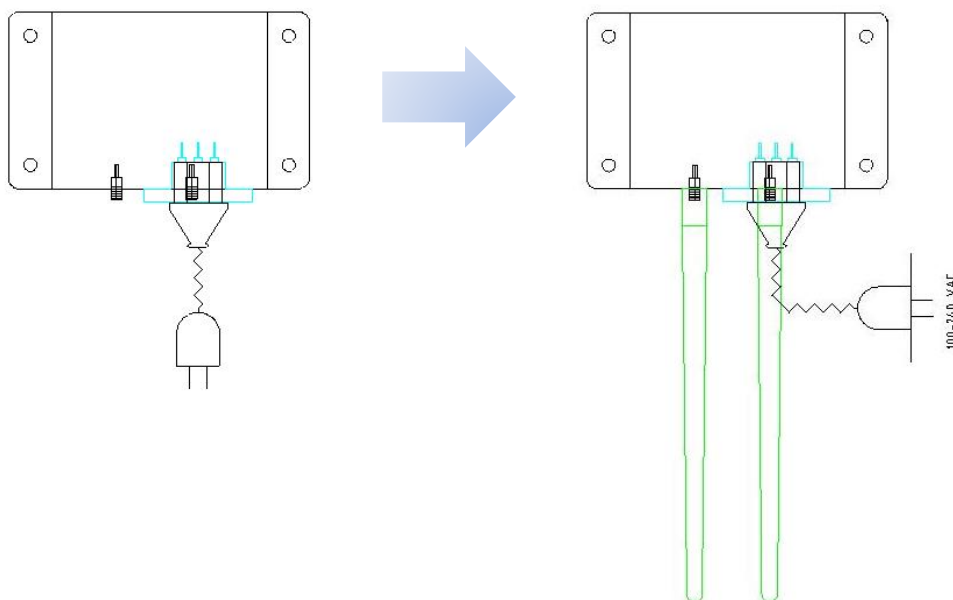
Day zero configuration provides a comprehensive interface to make the installation process in four easy steps.

1° Mount according to the drawing in page 4. Make sure that it has WIFI or GPRS reception (depending on the DASH version).

2° Attach two 2.4 GHz antennas, in their slots.



3° Plug the interlock cable and connect it to a power supply (100-240 VAC). This device has no buttons or switches so, once it is powered, it should start running.



4° When POWER led is on and RSSI-WIFI led is lock on red, DASH is operative and ready.

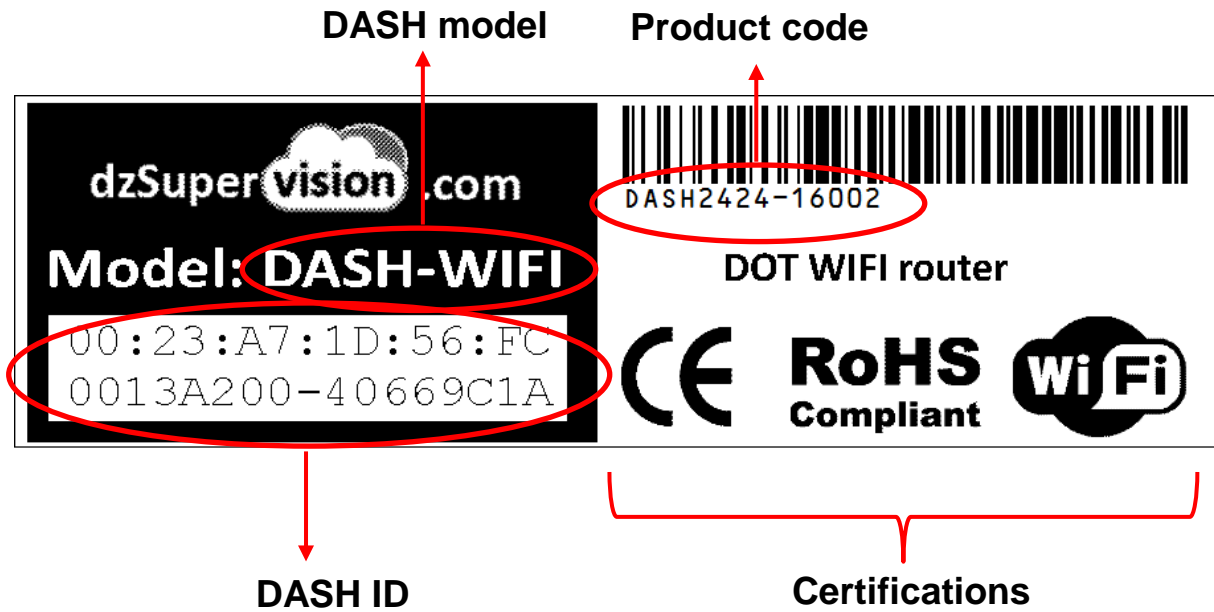
Led Signal Code



	RSSI-WIFI(red)	STATUS(white)	RSSI-DOT(blue)	POWER(green)
DASH on	-	-	-	On
Packet received from DOT.	-	-	Blinks. If packets of data are received continuously, this led may stay on.	-
Setting IP (DHCP).	Blinks for 1 second every 2 seconds.	-	-	-
IP configured.	On	-	-	-
Wi-Fi configuration setup failed.	Off	-	-	-
Updating Firmware	-	On	-	-
Normal operation.	-	Blinks for 1 second every 5 seconds.	-	-
Server is not responding.	-	2 500ms blinks every 2 seconds.	-	-
Micro SD failed.	-	3 500ms blinks every 2 seconds.	-	-
Losing data. Serial communication reached its max baud rate.	-	4 500ms blinks every 2 seconds.	-	-

Descriptive Label

On the right side of the housing is a silver-black label. This label contains relevant information about the device.



Basic Troubleshooting

Symptoms	Possible Reasons	Solutions
DASH is not responding. No led activity.	The device is disconnected.	Connect the DASH to a power supply (100-240 VAC).
	Power cable is damaged.	Replace the interlock power cable.
DASH can't configure a valid IP.	Wi-Fi signal quality is not strong enough.	Check that the antennas are well screwed. If they are, try replacing them. Check the Wi-Fi signal quality in the area.
	Bad setting of Wi-Fi configuration.	Check saved configuration on internal Micro SD card.
DASH can't connect with server.	DASH is not connected to internet.	See "DASH can't configure a valid IP".
	Server has no access to the DASH's network.	Check if the server is visible from the DASH's network.
Micro SD failed.	Micro SD card is damaged.	Replace the internal Micro SD card for a new one.
Loss of Data.	DASH is overloaded.	Remove DOTs connected to the DASH, one by one, until data is displayed in real time and no data is missing.

Recommendations, Warnings and Restrictions.

FCC-Approved Antennas (2.4 GHz)

For complying with FCC regulations, use the tables below for choose the correct antennas. If the antenna is mounted at least 20cm (8 in.) from nearby persons, the application is considered a mobile application. Antennas not listed in the table must be tested to comply with FCC Section 15.203 (Unique Antenna Connectors) and Section 15.247 Emissions). DASH does not carry all of these antenna variants. Contact Distributors for available antennas.

RF Antennas approved for use with the DASH 3.x Series (Cable loss is not required).

OMNI-DIRECTIONAL ANTENNAS				
Part Number	Type(Description)	Gain	Min Separation	Minimum Cable Loss/Power/Reduction/Attenuation Required
29000313	Integral PCB antenna	0.0 dBi	20 cm	N/A
A24-HASM-450	Dipole (Half-wave articulated RPSMA - 4.5")	2.1 dBi	20 cm	N/A
A24-HABSM	Dipole (Articulated RPSMA)	2.1 dBi	20 cm	N/A
29000095	Dipole (Half-wave articulated RPSMA - 4.5")	2.1 dBi	20 cm	N/A
A24-HABUF-P5I	Dipole (Half-wave articulated bulkhead mount U.F.L. w/ 5" pigtail)	2.1 dBi	20 cm	N/A
A24-HASM-525	Dipole (Half-wave articulated RPSMA - 5.25")	2.1 dBi	20 cm	N/A
A24-QI	Monopole (Integrated whip)	1.5 dBi	20 cm	N/A
A24-F2NF	Omni-directional (Fiberglass base station)	2.1 dBi	20 cm	N/A
A24-F3NF	Omni-directional (Fiberglass base station)	3.0 dBi	20 cm	N/A
A24-F5NF	Omni-directional (Fiberglass base station)	5.0 dBi	20 cm	N/A
A24-F8NF	Omni-directional (Fiberglass base station)	8.0 dBi	2 m	N/A
A24-F9NF	Omni-directional (Fiberglass base station)	9.5 dBi	2 m	N/A
A24-F10NF	Omni-directional (Fiberglass base station)	10 dBi	2 m	N/A
A24-F12NF	Omni-directional (Fiberglass base station)	12 dBi	2 m	N/A
A24-W7NF	Omni-directional (Fiberglass base station)	7.2 dBi	2 m	N/A
A24-M7NF	Omni-directional (Mag-mount base station)	7.2 dBi	2 m	N/A

Wi-Fi Antennas approved for use with the DASH 3.x Series.

DIPOLE ANTENNAS						
Part Number	Type(Description)	Gain	Min Separation	Minimum Cable Loss/Power/Reduction/Attenuation Required		
				b mode	g mode	n mode
A24-HASM-450	Dipole (Half-wave Articulated RPSMA-4.5")	2.1 dBi	20 cm	N/A	N/A	N/A
A24-HABSM	Dipole (Articulated RPSMA)	2.1 dBi	20 cm	N/A	N/A	N/A
A24-HABUF-P5I	Dipole (Half-wave bulkhead mount U.FL s/ 5" pigtail)	2.1 dBi	20 cm	N/A	N/A	N/A
A24-HASM-525	Dipole (Half-wave articulated RPSMA-5.25")	2.1 dBi	20 cm	N/A	N/A	N/A

OMNI-DIRECTIONAL ANTENNAS						
Part Number	Type(Description)	Gain	Min Separation	Minimum Cable Loss/Power/Reduction/Attenuation Required		
				b mode	g mode	n mode
A24-F2NF	Omni-directional (Fiberglass base station)	2.1 dBi	20 cm	N/A	N/A	N/A
A24-F3NF	Omni-directional (Fiberglass base station)	3.0 dBi	20 cm	N/A	N/A	N/A
A24-F5NF	Omni-directional (Fiberglass base station)	5.0 dBi	20 cm	N/A	N/A	0.12 dB
A24-F8NF	Omni-directional (Fiberglass base station)	8.0 dBi	2 m	N/A	N/A	3.12 dB
A24-F9NF	Omni-directional (Fiberglass base station)	9.5 dBi	2 m	N/A	1.0 dB	4.62 dB
A24-F10NF	Omni-directional (Fiberglass base station)	10 dBi	2 m	N/A	1.5 dB	5.12 dB
A24-F12NF	Omni-directional (Fiberglass base station)	12 dBi	2 m	N/A	3.5 dB	7.12 dB
A24-F15NF	Omni-directional (Fiberglass base station)	15 dBi	2 m	0.56 dB	6.5 dB	10.12 dB
A24-W7NF	Omni-directional (Fiberglass base station)	7.2 dBi	2 m	N/A	N/A	2.32 dB
A24-M7NF	Omni-directional (Mag-mount base station)	7.2 dBi	2 m	N/A	N/A	2.32 dB

PANEL CLASS ANTENNAS						
Part Number	Type(Description)	Gain	Min Separation	Minimum Cable Loss/Power/Reduction/Attenuation Required		
				b mode	g mode	n mode
A24-P8SF	Flat Panel	8.5 dBi	2 m	N/A	5.96 dB	10.04 dB
A24-P8NF	Flat Panel	8.5 dBi	3 m	N/A	5.96 dB	10.04 dB
A24-P13NF	Flat Panel	13.0 dBi	4 m	N/A	10.46 dB	14.54 dB
A24-P14NF	Flat Panel	14.0 dBi	5 m	N/A	11.46 dB	15.54 dB
A24-P15NF	Flat Panel	15.0 dBi	2 m	0.12 dB	12.46 dB	16.54 dB
A24-P16NF	Flat Panel	16.0 dBi	2 m	1.12 Db	13.46 dB	17.54 dB
A24-P19NF	Flat Panel	19.0 dBi	2 m	4.12 dB	16.46 dB	20.54 dB

RF Antennas approved for use with the DASH 3.x Series (Channels 11 - 25).

PANEL CLASS ANTENNAS				
Part Number	Type(Description)	Gain	Min Separation	Cable-Loss
A24-P8SF	Flat Panel	8.5 dBi	2 m	N/A
A24-P8NF	Flat Panel	8.5 dBi	2 m	N/A
A24-P13NF	Flat Panel	13.0 dBi	2 m	4.3 dB
A24-P14NF	Flat Panel	14.0 dBi	2 m	5.3 dB
A24-P15NF	Flat Panel	15.0 dBi	2 m	6.3 dB
A24-P16NF	Flat Panel	16.0 dBi	2 m	7.3 dB
A24-P19NF	Flat Panel	19.0 dBi	2 m	10.3 dB

OMNI-DIRECTIONAL ANTENNAS				
Part Number	Type(Description)	Gain	Min Separation	Cable-Loss
A24-F15NF	Omni-Directional (Fiberglass base station)	15.0 dBi	2 m	1 dB

YAGI CLASS ANTENNAS				
Part Number	Type(Description)	Gain	Min Separation	Cable-Loss
A24-Y6NF	Yagi (6-element)	8.8 dBi	2 m	N/A
A24-Y7NF	Yagi (7-element)	9.0 dBi	2 m	N/A
A24-Y9NF	Yagi (9-element)	10.0 dBi	2 m	N/A
A24-Y10NF	Yagi (10-element)	11.0 dBi	2 m	0.1 dB
A24-Y12NF	Yagi (12-element)	12.0 dBi	2 m	1.1 dB
A24-Y13NF	Yagi (13-element)	12.0 dBi	2 m	1.1 dB
A24-Y15NF	Yagi (15-element)	12.5 dBi	2 m	1.6 dB
A24-Y16NF	Yagi (16-element)	13.5 dBi	2 m	2.6 dB
A24-Y16RM	Yagi (16-element, RPSMA connector)	13.5 dBi	2 m	2.6 dB
A24-Y18NF	Yagi (18-element)	15.0 dBi	2 m	4.1 dB

Wi-Fi Antennas approved for use with the DASH 3.x Series (Channels 11 - 25).

YAGI CLASS ANTENNAS						
Part Number	Type(Description)	Gain	Min Separation	Minimum Cable Loss/Power/Reduction/Attenuation Required		
				b mode	g mode	n mode
A24-Y6NF	Yagi (6-element)	8.8 dBi	2 m	N/A	2.58 dB	7.52 dB
A24-Y7NF	Yagi (7-element)	9.0 dBi	2 m	N/A	5.78 dB	7.72 dB
A24-Y9NF	Yagi (9-element)	10.0 dBi	2 m	N/A	6.78 dB	8.72 dB
A24-Y10NF	Yagi (10-element)	11.0 dBi	2 m	N/A	7.78 dB	9.72 dB
A24-Y12NF	Yagi (12-element)	12.0 dBi	2 m	N/A	8.78 dB	10.72 dB
A24-Y13NF	Yagi (13-element)	12.0 dBi	2 m	N/A	8.78 dB	10.72 dB
A24-Y15NF	Yagi (15-element)	12.5 dBi	2 m	N/A	9.28 dB	11.22 dB
A24-Y16NF	Yagi (16-element)	13.5 dBi	2 m	0.56 dB	10.28 dB	12.22 dB
A24-Y16RM	Yagi (16-element, RPSMA connector)	13.5 dBi	2 m	2.6 dB	10.28 dB	12.22 dB
A24-Y18NF	Yagi (18-element)	15.0 dBi	2 m	4.1 dB	11.78 dB	13.72 dB

RF Exposure WARNING:

To satisfy FCC RF exposure requirements, a separation distance of 20 cm or more should be maintained between the antenna of this device and persons during device operation. To ensure compliance, operations at closer than this distance are not recommended.

Restrictions

France: Outdoor use limited to 10 mW EIRP within the band 2454-2483.5 MHz.

Norway: Norway prohibits operation near Ny-Alesund in Svalbard. More information can be found at the Norway Posts and Telecommunications site (www.npt.no).

Italy: For private use, a general authorization is required if WAS/RLANs are used outside own premises. For public use, a general authorization is required.

Russian Federation:

- Maximum mean EIRP density is 2 mW/MHz, maximum 100 mW EIRP.
- Maximum mean EIRP density is 20 mW/MHz, maximum 100 mW EIRP permitted to use SRD for outdoor applications only, for purposes of gathering telemetry information for automated monitoring and resources accounting systems or security systems.
- Maximum mean EIRP density is 10 mW/MHz, maximum 100 mW EIRP for indoor applications.

Ukraine: EIRP must be less than or equal to 100 mW with built-in antenna, with amplification factor up to 6 dBi.

Warranty Information

1 Year Warranty

DOT and DASH devices, from Ampexa are warranted against defects in materials and workmanship under normal use, for a period of 1 year from the date of purchase. In the event of a product failure due to materials or workmanship, Ampexa will repair or replace the defective product. For warranty service, return the defective product to Ampexa, shipping prepaid, for prompt repair or replacement.

The foregoing sets forth the full extent of Ampexa's warranties regarding the product. Repair or replacement at Ampexa's option is the exclusive remedy.

THIS WARRANTY IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, AND AMPEXA SPECIFICALLY DISCLAIMS ALL WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL AMPEXA-AMEPXA, ITS SUPPLIERS OR LICENSORS BE LIABLE FOR DAMAGES IN EXCESS OF THE PURCHASE PRICE OF THE PRODUCT, FOR ANY LOSS OF USE, LOSS OF TIME, INCONVENIENCE, COMMERCIAL LOSS, LOST PROFITS OR SAVINGS, OR OTHER INCIDENTAL, SPECIAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THE PRODUCT, TO THE FULL EXTENT SUCH MAY BE DISCLAIMED BY LAW. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES. THEREFORE, THE FOREGOING EXCLUSIONS MAY NOT APPLY IN ALL CASES. This warranty provides specific legal rights. Other rights which vary from state to state may also apply.

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