WaveNet-EX Series

Quick installation guide

WiFi MIMO access point & Mesh router for hazardous areas

- ✓ WiFi Access Point, WiFi client, repeater, router & Mesh point (A10 and A12 only)
- ATEX / IECEX certification :
 - Zone 1, 2, 21 & 22
 - II 2G Ex db IIC T5-T4 Gb
 II 2D Ex tb IIIC T110°C/T140°C Db
 I M2 Ex db I Mb (SWS only)
- ✓ USA & CANADA CERTIFICATION Class I, Division 1, Groups B, C and D Class II, Division 1, Groups E, F and G Class I, Zone 1, Groups IIB+H2 [For U.S. only] Zone 21, Groups IIIC [For U.S. only]
- Heavy duty aluminum (SWA series) or stainless steel (SWS series) IP66/IP68 enclosure
- ✓ 2 or 3 intrinsically safe RF outputs
- ✓ Gigabit Ethernet network interface
- DC power supply input (+18VDC to +60VDC), PoE or PPoE (Passive Power over Ethernet)

Before starting, please check the product kit part listing below. Contact immediately your dealer if any item is missing or damaged:

- > One WaveNet-EX
- > This quick installation guide printed

Before continuing, check thanks to the ACKSYS website: www.acksys.fr/en

- If a latest update of this quick start is available
- Download and read the full manual « WaveOS user guide ».

You will need:

- a PC equipped with Ethernet access to install the « WaveManager » software,
- a web browser, IE compatible,
- an android smartphone if you want to install the optional « ACKSYS WaveViewer » App.

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READ THIS INSTRUCTION FIRST

To avoid serious or fatal personal injury or major property damage, read and follow all safety instruction in this manual. If you require additional assistance, please contact ACKSYS.

This product must be installed and maintenance according to suitable standards for electrical application in potentially explosive atmospheres (example: IEC/EN 60079-14, IEC/EN60079-17 or other national standards). Read this first and keep this instruction manual always available.

This instruction refers to certified equipment covered by the EXA 14 ATEX 0042, IECEx EXA 14.0001 and by LR1504 certificate.

NOTE

1. Suitably trained personnel shall carry out installation according with applicable code practice.

2. Cover must be tightening with a torque of at list 15 Nm.

3. To avoid the thread cover blocking the thread joint can be protect with grease like Nyogel 760G, Uniflor 8512R, Uniflor 8911 or equivalent compatible with silicon gasket

4. The user should not repair this equipment.

5. The user should not modify the enclosure and related components inside.

6. For ambient temperature below -10°C and above 70°C use field wiring suitable for both minimum and maximum ambient temperature.

7. The electrical devices must be grounded using their grounding connections.

 $\pmb{8}.$ The user should guarantee the keeping of the safety characteristic of the device after maintenance.

9. If the equipment is likely to come in to contact with aggressive substances, it is responsibility of the user to take suitable precautions that prevent it from being adversely affected, thus ensuring that the type of protection is not compromised. Aggressive substances: example Acids, liquids, gases with can affected metals.

10. The metallic alloy used for the enclosure, in the event of a rare accident, could cause ignition sources due to impact or friction (sparks may occur). This shall be considered when the box is installed in group Ex area.

11. Remove plastic plugs or plastic stickers supplied with enclosure before installation, these components aren't certified. All cables entry devices and blanking elements shall be certified in the type of explosion protection flameproof type "d" and "tb" suitable of use in Ex area and correctly installed.

12. For functionality of device installed inside the enclosure refer to device instruction



Warns of hazard that MAY cause serious personal injury, death or major property damage.

HAZARDOUS VOLTAGE Disconnect all power before servicing equipment. DO NOT REMOVE COVER WHEN ENERGISED. DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT.

The conduit plug supplied with the switch boxes are for transit purposes only. IP66/68 protection depends on cable gland and cabling methods used. Before the installation verify into the Annex to Installation & Operation manual the limitation to use and the accessories allowed.

NOMENCLATURE

SWA	A10	33	-	42	0	X0
1	2	3		4	5	6
1 – Enclosure SWA Alumi SWS Stainl	nium polyester powo ess steel AISI 316 (0	er coated CF8M) electropolish	4 – Cable ent 42 n° 44 n°	ies 4 3/4" npt-f (two used 1 4 M25x1.5 (two used f	for antenna connecti or antenna connecti	on) on)
2 - Device code A10 802.1 A11 802.1 A12 802.1	1n, MIMO 2x2 1ac, MIMO 2x2 1n, MIMO 2x2 plus 8	302.11ac (1 stream)	5 – Colour 0 blac E elec	k polyester powder co tropolished (SWS hou	ating (SWA series or sings only)	ıly)
3 – Antenna conr 30 n° 3 F 33 n° 2 F	nection XXN antenna coupler XXN antenna coupler	(N Female) (N Female)	6 – Approvals X0 At M0 At	ex/IECEx Gas and Dus ex/IECEx Gas, Dust an S CI 1 DIV1 and North	st certified, Zone 1, 2 Id mining certified, Zo	, 21 & 22 one 1, 2, 21 & 22 ted

PRODUCT'S STORAGE

Keep the boxes away from atmospheric agents in an environment with temperature between 0° C and 40° C.

INSTALLATION

Attach the enclosure to a fix surface using four M6 bolts The unit can be installed in all position.

ELECTRICAL WIRING

Remove screw cover, remove protection plugs from cable entries and substitute them with cable glands or conduits or plugs suitable for type of protection required.

Connect terminal strip according to the wiring diagram present into the Annex to Installation & Operation Manual.

Reassemble screw cover and lock it by means of the screw or anti rotation kit.

WARNING: Before closing the enclosure check that thread joint were free of foreign matters and deformations check seal is properly fitted in slot.

The cover must be screwed and securely locked to the body.

MAINTENANCE

The verification and maintenance of the electrical equipment must be performed according to IEC/EN 60079-17.

The cover must be securely locked to the body. After every opening must to check before closing that he thread joint is free of foreign matters and deformations and if necessary lubricate the thread joint in order to avoid cover blocking with grease like Nyogel 760G, Uniflor 8512R, Uniflor 8911 compatible with silicon gasket or equivalent according to enclosure temperature range.

In order to guarantee the protection degree IP66-68 it's necessary that the gasket is maintained in good conditions and must be verified after every opening that the same does not show breakage or





cuttings. In case of damage replace with ACKSYS spare part.

The maintenance related the components used for wiring must be performed according to manufacturer instruction.

DISPOSAL / RECYCLING

Disposal and recycling of the product according to national regulation for waste disposal and recycling.

WARNING: Do not dispose the product and the components in the environment.

DESCRIPTION

The SWA & SWS A series is a WiFi access point equipped with 1 Ethernet port and up to 3 WiFi ports as follows:

Device version	Model	WiFi Port
A10	WiFi Access point 802.11n MIMO 2x2	n° 2
A11	WiFi Access point 802.11ac MIMO 2x2	n° 2
A12	WiFi Access point 802.11n MIMO 2x2 plus 802.11ac (1 stream)	n° 3

A10

A11

A12







POWER SUPPLY

Screw terminals = Supply voltage: 18 ~ 60 VDC RJ45 connector = PPoE @ 24 VDC or PoE @ 48 VDC * Max Power Consumption 8W for A10 / 14W for A11 and A12 * PPoE = Passive Power over Ethernet (operating voltage 24VDC), PoE = Power over Ethernet (operating voltage 48VDC)

TEMPERATURE RANGE

Device version	Model	Ambient temperature range
SWA	Aluminum enclosure	min -40°C – max +60°C
sws	Stainless steel enclosure	min -40°C – max +50°C

 $\mbox{WARNING}$: The unit can reach a surface temperature of 70°C, use cable and cable glands / conduit Ex certified suitable for this temperature.

WIRING

	Label	Description RJ45 LAN connector (PPoE @24VDC or PoE @ 48VDC)*
	J1 <i>Label</i> - +	Description Power supply - (18 ~ 60 VDC) Power supply + (18 ~ 60 VDC)
RMS LAN Connector	F1 <i>Label</i> 750mA	Description 5x20 mm power line fuse (750mA fast-blow type)
	Label PWR DIAG	Description Power led indication Diagnostic led indication
ana Se	SW1 <i>Label</i> RESET	Description Reset button
	SW2 <i>Label</i> POE/PPOE	Description DIP switch for PoE / PPoE
	1 ON = 48V = 1 OFF = 24V =	PoE PPoE
	DIP switch oper supply	ate only in case of PoE/PPoE power
	* PoE = Power ((operat	over Ethernet ting voltage 48VDC)

(operating voltage 48VDC) PPoE = Passive Power over Ethernet (operating voltage 24VDC)

Step 1 – ANTENNA CONNECTION

22.2

Connect the antenna before to turn on the device.

WARNING : use antenna only with 50Ω impedance and with operating frequency in according to technical data listed into the above paragraph "RF information".

The device must be set according to limitation listed at paragraph MAXIMUM PERMITTED RF THRESHOLD POWER (Pth) for installation in Hazardous Location and the national regulation rules.

Step 2 – POWER SUPPLY CONNECTION

WARNING : DO NOT WIRED POWER SUPPLY WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT.

FOR SAFETY REASONS WIRING MUST BE MADE ACCORDING TO WA & WS INSTALLATION AND OPERATION MANUAL

The device can be powered by terminal strip (J1 $\,$ 18 \sim 60 VDC) or through PoE/PPoE.

In case of PoE (Power over Ethernet, 48VDC) set the DIP Switch SW2 nr. 1 to ON,

In case of PPoE (Passive Power over Ethernet, 24 $\,$ VDC) set the DIP Switch SW2 nr. 1 to OFF

The DIP switch position has no influence in case of power supply through terminal strip ${\rm J1}$

The device has no ON/OFF switch. It turns on automatically when power is applied. Check that the PWR led turn on.

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The DIAG led stay off for around 40 seconds, until the device is fully ready to use. Then the DIAG led turns blue.

Step 3 – ETHERNET CONNECTION

Connect the Ethernet cable (if it not connected in case of PoE or PPoE).

DEVICE CONFIGURATION

FACTORY SETTINGS:

- IP address: 192.168.1.253
- Radio Interface disable, preset for access point mode
- SSID: acksys (broadcast)
- No security (no WEP, no WAP, no WAP2, no MAC filter)
- 802.11n or ac mode, 5GHz band, auto-channel
- WEB interface for device configuration:

IP address: 192.168.1.253

User name: root

Password: no password set as factory setting

Step 1

Verify that the IP address factory setting is compatible with your network, if the IP address is not suitable for your network use Windows application **WaveManager** (available on web site <u>www.acksys.fr</u>).

🔊 Wavel	fanager - Ver 1.8.3.1									-	- 0	×
A											С	0
	. –	Products Roles	Dashboard									
		Mode1										
ø	Product search	EmbedAir100	00001980	17154101	E2148.AC	.1 3.18.3.1	192.168.10	User-def	inable			
Ø	Setup											
8	Database											
	Settings											
		Role	Radi	o C	Mode	SSID	RSSI	d8n	Security	85	SID As	soc

After the WaveManager installation run the application, select the EmbedAir1000 device then click to "Setup": now you can configure the IP address or you can activate the DHCP client.

Step 2

Using your web browser open the WEB interface (IP address: 192.168.1.253) and select the "SETUP" tab:

	SETUP TOOLS STATUS	
EVICE INFO		
IETWORK	DEVICE INFORMATION	
/IRELESS	FIRMWARE INFORMATION	
ERVICES	WaveOs version:	3.18.3.1
OGS	Boot loader version:	3.0.6.1
	Firmware ID:	E2148.AC.1
	DEVICE INFORMATION	
	Host name:	Acksys
	Model:	EmbedAir1000/R2
	Product version:	V1
	Motherboard ID:	0000198d7819
	Desident a solut sumbars	

For setup page, user name and password are required and for factory setup the user name is **root** and no password is required (these data can be changed under "TOOLS" tab, PASSWORD SETTINGS section)

SETUP	TOOLS	STATUS			
AUTHORIZA	TION REQU	IRED			
Please en	ter your usemam	e and password.			
Username			🚨 root	~	
Password			P		
				🙆 Reset	Login

On the "WIRELESS INTERFACES OVERVIEW" page you should first select your **country** in order to enforce applicable **regulation rules**. The country selector is located in the global parameters, near the bottom of the page.

	SETU	JP TO	DLS	STATUS						
PHYSICAL INTERFACES			EACER							
VIRTUAL INTERFACES	WIREL	COOINTER	FACES	JVERVIEW						
NETWORK	You	can set up to	3 simultane	ous roles (wifi interface	types) (er radio card	, among the f	ollowing combinati	ons:	
VPN				Channel	selectio	1		Max number of	interfaces	
BRIDGING		Com	pination	n Multiplicity Can use DFS		use DFS	Access	Infrastructure	Mesh point	Ad-hoc
ROUTING / FIREWALL						901	point 11ac radio c	cnent		
QOS		Multip	e access	single, auto.		002	. The rulio c	0103		
SERVICES		po	oints	multiple		yes	8			
		Client	/ bridge	single, auto, multiple, roaming*		yes		1		
		S	RCC	single		yes	auto	auto		
		Other	/ Ad-hoc	single		no			unsupported	unsupported
						802.1	In only radio	cards		
		Multipl	e access bints	single, auto, multiple		yes	8			
		P	ortal	single		no	8		1	
		Client	/ bridge	single, auto, multiple, roaming		yes		1		
		Other	repeater	single		no	8	1 (non-roaming)	1	1
	* Th	e roaming feat TERFACE WIFI 1: WI-F	ure is not y	at available for IEEE80	2.11ac o	ards.				
		CHANNEL	802 11 M	ODE SSID			ROLE		SECURITY	ACTION
	1940	5	802.11g	+n acksys_1_2.4	4_test	Access P	oint (infrastrue	ture) WPA2	-PSK (Person	al) 🗹 🗶
	WI-FLIN	TERFACE								
		WiFi 2: Wi-F	i 5 (802.11	ac) Wireless inter	face					•
		CHANNEL	802.11 MO	DE SSID		ROL	E	SECUR	ITY	ACTIONS
		48	802.11ac	n acksys_2_5_tes	st A	ccess Point (in	nfrastructure)	WPA2-PSK (F	Personal)	Interface disable
	GLOBA		ETERS							
	RADIO R	REGULATION A	REA							
	Coun	try			Unite	d States			•	
									_	

You can select radio interface to set up its WiFi parameters (you can also change IP configuration and services).

In function of device version the WiFi Interface available are:

Device version	Model	WiFi Interface used	
A10	WiFi Access point 802.11n MIMO 2x2	1	WiFi Interface 1 only (antenna 1 and 2)
A11	WiFi Access point 802.11ac MIMO 2x2		WiFi Interface 2 only (antenna 1 and 2)
A12	WiFi Access point 802.11n MIMO 2x2 plus 802.11ac (1 stream)		WiFi Interface 1 (antenna 1 & 2) and WiFi Interface 2 (antenna 3)

For WiFi and LAN interface setup click on relative menu on "PHYSICAL INTERFACES" menu:

MIEL 4	WIRELESS SETTINGS : WIFI 1				
WIFI 2 LAN RTUAL INTERFACES	The Device Configuration section covers phys network settings like encryption or operation If SRCC role is selected, most of the Device	ical settings of the radio hardware which is shared among all defined wireless networks are in the Interface Configuration. Configuration is irrelevant (please refer to the product user guide).	vorks.		
TWORK	DEVICE CONFIGURATION				
PN					
RIDGING	General Setup a/b/g Data Rates 802.11r	Mcs Advanced Settings			
UTING / FIREWALL	802.11 mode	802.11g+n (2.4 GHz)			
IS		Changing the mode may affect the list in the 'a/b/g data rates' tab			
RVICES	HT mode	40MHz 2nd channel below			
		Automatic 40MHz HT mode is not compatible with AP, Ad-hoc, Mesh and multi-interfaces			
	Automatic channel select	Automatic channel select is not compatible with Ad-hoc, Mesh and multi-interface	6		
	Channel	S (2423 Citil) Seture 15 exposure 20 distin (C 1424 Citil) - Mex Th power 20 distin (C 1442 Citil) - Mex Th power 20 distin (C 1447 Cit			
		 B (2,447 CH2) - Max Tx power 20 dBm P (2,452 CH2) - Max Tx power 20 dBm 10 (2,457 CH2) - Max Tx power 20 dBm This Reid a ignored in chiert pressive reaming mode; use Reaming tab instead 			
	INTERFACE CONFIGURATION General Setup Wireless Security Advant	B (2.447 OIz) - Max Tx power 20 dbm 9 (2.452 OIz) - Max Tx power 20 dbm 10 (2.457 OIz) - Max Tx pow			
	NTERFACE CONFIGRATION General Setup Wireless Security Advant Security Protected management firame (82.11v)	B (2.447 CH2) - Max Ts yower 20 dbm S (2.447 CH2) - Max Ts yower 20 dbm S (2.454 CH2) - Max Ts yower 20 dbm To that a growed in diert preadine naming mode are Therming lab indead ed Settings MAC Fitter Frame fitters WPA2-FSI (Personal) Gable g			
	INTERFACE CONFIGURATION General Setup Wireless Security Advantisecurity Protected management frame (802-11w) Pre-Shared Key	B (2.447 OIz) - Max Tx yover 20 dbm 9 (2.452 OIz) - Max Tx yover 20 dbm 10 (2.457 OIz) - Max Tx pover 20 dbm 10 (2.457 OIZ) - Max Tx po	will be		
	HTERFACE CONFIGURATION Ceneral Setup Wireless Security Advant Security Protected management frame (802.11vr) Pre-Shared Kry Group rekey interval	B (2.447 CH2) - Max Tx power 20 dbm S (2.447 CH2) - Max Tx power 20 dbm S (2.452 CH2) - Max Tx power 20 dbm S (2.452 CH2) - Max Tx power 20 dbm S (2.452 CH2) - Max Tx power 20 dbm S (2.452 CH2) - Max Tx power 20 dbm S (2.472 CH2) - Max Tx power 20 dbm S	will be		
	INTERFACE CONFIGURATION General Setup Wireless Security Advantagement frame (802.11w) Protected management frame (802.11w) Pre-shared Key Group rekey interval	B (2.447 CH2) - Max Tx power 20 dbm 9 (2.452 CH2) - Max Tx power 20 dbm 19 (2.457 CH2) - Max Tx power 20 dbm 19 (2.457 CH2) - Max Tx power 20 dbm 19 (2.457 CH2) - Max Tx power 20 dbm 10 (2.457 CH2) - Max Tx pow	will be		
	HITERFACE CONFIGURATION General Setup Wireless Security Advantages of the state of the security Protected management frame (802.11v) Pre-shared Key Group rekey interval Pair rekey interval	B (2,447 CH2) - Max Ts yower 20 dbm S (2,452 CH2) - Max Ts yower 20 dbm S	will be		
	BITERFACE CONFIGURATION General Setup Focarity Protected management frame (80.11v) Pre-shared Key Group rekey interval Pair rokey interval	B (2,447 CH2) - Max Tx power 20 dbm (2,447 CH2) - Max Tx power 20 dbm (2,452 CH2) - Max Tx power 20 dbm	will be		
	BITEMACE CONFIGURATION General Setup Wireless Security Adam Protected management frame (802.11w) Pre-shared Key Group rekey interval Group rekey interval Pair rekey interval Baster rekey interval	B (2447 CH2) - Max Ts yower 20 dbm B (2447 CH2) - Max Ts yower 20 dbm B (2452 CH2)	will be		

Set for each WiFi interface the following essential parameters:

- The operating mode: 802.11 mode, radio channel (take care about local legislation), SSID
- WiFi security parameters (WEP, WPA, WPA-PSK, WPA2, WPA2-PSK, SSID broadcast or not)

For more details consult Acksys WaveOS User Guide.

TROUBLESHOOTING AND LED DEFINITION

None of the LED indicators turn ON

- Verify the power supply (voltage, cabling)
- Verify the fuse F1

The WiFi link does not come up

- Make sure that the Wireless parameters of the Client (case sensitive SSID, 802.11 mode, radio channel and security) match those of the AP
- Check the radio conditions: distance between devices, placement of antennas, interferences and obstacles to radio waves propagation
- Try with all securities and encryption settings temporarily disabled
- Try another radio channel

How to restore factory settings?

- If the built-in web-based interface is reachable, you can use a browser to restore factory settings.
- Else, power up the unit, wait for the DIAG led to turn blue, then hold down the reset button (for at least 2 seconds) until DIAG goes off. Then release it and wait for the DIAG led to turn blue again, meaning that the product rebooted with its factory settings.

LED Definition

LED	Function
PWR	Green : power on Off : power not present
DIAG	Blue : when product is OK and initialized Flashing : when firmware in flash is not valid Off : for more then 2min with PWR led green indicate a Hardware/Software failure

RF INFORMATION

Device						
	ANTENNA 1 AND 2 *					
	Radio modes: Support for IEEE 801.11a/h, 802.11b, 802.11g and 802.11n					
	Frequency band for 802.11a/n : 5 GHz; 5.170 to 5.835 GHz					
	Frequency band for 802.11b/g/n : 2.4 GHz; 2.402 to 2.494 GHz					
A10	Tx output power (Radio card output per chain, antenna excluded) 802.11n HT20 2.4GHz band 20.5 dBm @ 7.2 Mbps (MCS 0) 18 dBm @ 72.2 Mbps (MCS 7)					
	802.11n HT40 2.4GHz band 20.5 dBm @ 15 Mbps (MCS 0)					
	802.11n HT20 5GHz band 18 dBm @ 7.2 Mbps (MCS 0) 15 dBm @ 7.2 Mbps (MCS 0)					
	802.11n HT40 5GHz band 18 dBm @ 15 Mbps (MCS 0) 15 dBm @ 150 Mbps (MCS 7)					
	Value for 1 stream, add 3 dBm for 2 streams					
	ANTENNA 1 AND 2 ^					
	Radio modes: Support for IEEE 801.11a/h, 802.11b, 802.11g, 802.11n and 802.11ac					
	Frequency band for 802.11a/n : 5 GHz; 5.170 to 5.835 GHz					
	Frequency band for 802.11b/g/n : 2.4 GHz; 2.402 to 2.494 GHz					
	Tx output power (Radio card output per chain, antenna excluded) 802.11b 2.4GHz band 20 dBm @ 1 Mbps					
	802.11g 2.4GHz band 21 dBm @ 6 Mbps					
A11	802.11a 5GHz band 20 dBm @ 54 Mbps 15 dBm @ 6 Mbps					
	802.11n HT20 2.4GHz band 21 dBm @ 7.2 Mbps (MCS 0)					
	16 dBm @ 72.2 Mbps (MCS 7) 802.11n HT40 2.4GHz band 20 dBm @ 15 Mbps (MCS 0) 16 dBm @ 150 Mbps (MCS 7)					
	802.11n/ac VHT20 5GHz band 19 dBm @ 7.2 Mbps (MCS 0) 14 dBm @ 7.2 Mbps (MCS 0)					
	13 dBm @ 86.7 Mbps (VHT MCS 8) 802.11n/ac VHT40 5GHz band 14 dBm @ 150 Mbps (MCS 0) 14 dBm @ 150 Mbps (MCS 7) 14 dBm @ 0200 Mbrs (MCS 20)					
	13 dBm @ 200 Mbps (VHT MCS 9) 802.11ac VHT80 5GHz band 18 dBm @ 32.5 Mbps (MCS 0) 14 dBm @ 325 Mbps (MCS 7) 10 dBm © 4000 Mbms (MCS 7)					
	Value for 1 chain, add 3 dBm for 2 chains (Tolerance ± 2 dB)					
	ANTENNA 1 AND 2 *					
A12	Radio modes: Support for IEEE 801.11a/h, 802.11b, 802.11g and 802.11n					
A12	Frequency band for 802.11a/n : 5 GHz; 5.170 to 5.835 GHz					
	Frequency band for 802.11b/g/n : 2.4 GHz; 2.402 to 2.494 GHz					

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MAXIMUM PERMITTED RF THRESHOLD POWER (Pth)

The RF threshold power (Pth), sometimes called the effective isotropic radiated power (EIRP), as defined in IEC /EN 60079-0, is the product of the effective output power of the transmitter multiplied by the antenna gain. The maximum threshold powers for each equipment group as defined by Table 4 in IEC/EN 60079-0 are provided below.

Because most antennas list the gain relative to an isotropic radiator (dBi) instead of the raw power gain, it is often easier to simply add the antenna gain in dBi to the radio output power in decibel-milliwatts (dBm). Any added cable loss between the RF output and the antenna may also be factored in.

Pth $_{(dBm)}$ = RF output power $_{(dBm)}$ + Antenna gain $_{(dBi)}$ – Coax cable loss between RF output and Antenna $_{(dB)}$

The resulting threshold power calculated by the above formula MUST be below the threshold power for the operating area group rating below.

Equipment for	Threshold Power (W)	Threshold Pwr (dBm)
Group I	6	37.7
Group IIA	6	37.7
Group IIB	3.5	35.4
Group IIC	2	33.0
Group III	6	37.7

The above threshold level refer to installation in classified area Ex according to IEC/EN 60079-0 standard.

The use of device differs from one region and/or country to another. The user of the device must take care that the device is operated only according to local rules and standard or without the permission of the local authorities on frequencies other than those specifically reserved and intended for use without a specific permit. More detailed information is available at the local frequency management authority.

MAXIMUM JOULES CALCULATION IN CASE OF COAX CABLE INSTALLATION

In case of use of a coax cable installation for antenna installation the adding cable need to be evaluating to ensure that the maximum energy stored on cable not exceeded the value allowable per IEC/EN 60079-11:

Max energy (Joules) allowed per IEC/EN 60079-11		
Group I	1500 µJ	
Group IIA	950 µJ	
Group IIB	250 µJ	
Group IIC	50 µJ	

The calculation can be done Example: according to following equation: Antenna cable capacitance = 1195 pF $E = \frac{1}{2} * \left\{ (C_1 + C_2) * \left[(1.5 * (\sqrt{R * P}) \right]^2 \right\}$ $E = \frac{1}{2} * \{ (18pF + 1195pF) * 7.08 \} = 0,00858\mu J$ Where: E = EnergyAnswer = $0,00858 \mu J$ acceptable for C₁ = Antenna Barrier Capacitance any Group (18 pF) C₂ = Coax cable capacitance $R = Impedance (50\Omega)$ P = RF power output (18 dBm, 63 mW) 1.5 = Safety Factor

ATEX / IECEX CERTIFICATION INFORMATION

Atex identification:	II 2G Ex db IIC T5-T4 Gb II 2D Ex tb IIIC T110°C/T140°C Db I M2 Ex db I Mb (SWS series only) IP66-68 Atex certificate number EXA 14 ATEX 0042
IECEx identification:	Ex db IIC T5-T4 Gb Ex tb IIIC T110°C/T140°C Db Ex db I Mb (SWS series only) IP66-68 IECEx certificate number IECEx EXA 14.0001
USA & CANADA:	Class I, Division 1, Groups B, C and D Class II, Division 1, Groups E, F and G Class I, Zone 1, Groups IIB+H2 [For U.S. only] Zone 21, Groups IIIC [For U.S. only]