

User Manual

Version 1.0

Revision History

Rev No.	Change Notification	Date	Remarks
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Index

1. FCC and ISED Mandatory	6
1.1 FCC Warning States	6
1.1.1 FCC Part 15.19 Warning	6
1.1.2 FCC Booster Warning Label	6
1.1.3 FCC Booster Warning Statements	6
1.1.4 FCC Part 15 Class A	7
1.1.5 RF Radiation Exposure	7
1.2 ISED Warning states	8
1.2.1 ISED Warning Label	8
1.2.2 RSS-GEN (6.8 Transmit Antenna)	오류! 책갈피가 정의되어 있지 않습니다.
1.2.3 RF Radiation Exposure	8
2. General Information	9
2.1 Repeater Information (FCC & ISED ID)	9
2.2 Purpose	9
2.3 Advantages	9
2.4 Exterior	10
2.5 Interior	12
3. Specifications	13
3.1 Frequency Range	13
3.2 RF Specifications	13
3.3 Mechanical Specifications	14
4. Integrated Enclosure Interfaces	오류! 책갈피가 정의되어 있지 않습니다.

- 4.1 **DONOR & SERVICE Connector** 오류! 책갈피가 정의되어 있지 않습니다.
- 4.2 **ACCESSORY Feedthrough** 오류! 책갈피가 정의되어 있지 않습니다.
- 4.3 **ALARM RELAY Feedthrough** 오류! 책갈피가 정의되어 있지 않습니다.
- 4.4 **110-220VAC Feedthrough** 오류! 책갈피가 정의되어 있지 않습니다.
- 4.5 **BATTERY Feedthrough** 오류! 책갈피가 정의되어 있지 않습니다.
- 4.6 **ANNUNCIATOR Feedthrough** 오류! 책갈피가 정의되어 있지 않습니다.
- 4.7 **GUI Connector** 오류! 책갈피가 정의되어 있지 않습니다.
- 5. **LED Indicators** 오류! 책갈피가 정의되어 있지 않습니다.
 - 5.1 **SYSTEM LED** 오류! 책갈피가 정의되어 있지 않습니다.
 - 5.2 **ANNUNCIATOR LEDs** 오류! 책갈피가 정의되어 있지 않습니다.
- 6. **Installation Guide** 오류! 책갈피가 정의되어 있지 않습니다.
 - 6.1 **Environment** 오류! 책갈피가 정의되어 있지 않습니다.
 - 6.1.1 **Antenna** 오류! 책갈피가 정의되어 있지 않습니다.
 - 6.1.2 **Isolation Check and Gain Setting** 오류! 책갈피가 정의되어 있지 않습니다.
 - 6.2 **Mounting the BDA** 오류! 책갈피가 정의되어 있지 않습니다.
 - 6.2.1 **Installation of Concrete Wall** 오류! 책갈피가 정의되어 있지 않습니다.
- 7. **Web GUI Configuration** 오류! 책갈피가 정의되어 있지 않습니다.
 - 7.1 **Web GUI Overview** 오류! 책갈피가 정의되어 있지 않습니다.
 - 7.2 **Laptop Configuration for Connect to the Repeater** 오류! 책갈피가 정의되어 있지 않습니다.
 - 7.2.1 **GUI Port Connect** 오류! 책갈피가 정의되어 있지 않습니다.
 - 7.2.2 **NMS Port Connect** 오류! 책갈피가 정의되어 있지 않습니다.
 - 7.3 **Web GUI Connect and Sign In** 오류! 책갈피가 정의되어 있지 않습니다.
 - 7.4 **System Setting Screen** 오류! 책갈피가 정의되어 있지 않습니다.

- 7.5 RF Configuration / General / Operation Screen..... 오류! 책갈피가 정의되어 있지 않습니다.
- 7.6 Filter Screen..... 오류! 책갈피가 정의되어 있지 않습니다.
- 7.7 Alarm Screen..... 오류! 책갈피가 정의되어 있지 않습니다.
- 7.8 Table Screen 오류! 책갈피가 정의되어 있지 않습니다.
- 7.9 Firmware Update Screen 오류! 책갈피가 정의되어 있지 않습니다.
- 8. Troubleshooting 오류! 책갈피가 정의되어 있지 않습니다.
 - 8.1.1 Simple Troubleshooting Method 오류! 책갈피가 정의되어 있지 않습니다.
 - 8.1.2 Troubleshooting Guide Related to System Operation 오류! 책갈피가 정의되어 있지 않습니다.
 - 8.1.3 Troubleshooting Guide Related to Alarm State..... 오류! 책갈피가 정의되어 있지 않습니다.
 - 8.1.4 Troubleshooting Guide Related to NMS..... 오류! 책갈피가 정의되어 있지 않습니다.
 - 8.1.5 Replaceable Batteries..... 오류! 책갈피가 정의되어 있지 않습니다.

1. FCC and ISED Mandatory

1.1 FCC Warning States

1.1.1 FCC Part 15.19 Warning

The 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.

1.1.2 FCC Booster Warning Label

1) Part 90 Signal Boosters – THIS IS A 90.219 CLASS B DEVICE

WARNING. This is NOT a CONSUMER device. It is designed for installation by FCC LICENSEES and QUALIFIED INSTALLERS. You MUST have an FCC LICENSE or express consent of an FCC Licensee to operate this device. You MUST register Class B signal boosters (as defined in 47 CFR 90.219) online at www.fcc.gov/signal-boosters/registration. Unauthorized use may result in significant forfeiture penalties, including penalties in excess of \$100,000 for each continuing violation.

1.1.3 FCC Booster Warning Statements

Use of unauthorized antennas, cables, and/or coupling devices not conforming with ERP/EIRP and/or indoor-only restrictions is prohibited.

Home/ personal use are prohibited.

Only 50 ohm rated antennas, cables and passive equipment shall be used with this remote. Any equipment attached to this device not meeting this standard may cause degradation and unwanted signals in the bi-directional system. All components connected to this device must operate in the frequency range of this device.

1.1.4 FCC Part 15 Class A

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their own expense.

1.1.5 RF Radiation Exposure

This equipment complies with RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of **UL: 90 cm, DL: 100 cm** between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. RF exposure will be addressed at time of installation and the use of higher gain antennas require larger separation distances.

(UL: LDPA antenna Max. peak gain: 9 dBi, DL: Omni directional antenna Max. peak gain: 3.5 dBi)

1.2 ISED Warning states

1.2.1 ISED Warning Label

WARNING: This is NOT a CONSUMER device. It is designed for installation by an installer approved by an ISED licensee. You MUST have an ISED LICENCE or the express consent of an ISED licensee to operate this device.

AVERTISSEMENT: Ce n'est PAS un appareil de consommation. Il est conçu pour être installé par un installateur approuvé par un titulaire de licence d'ISD. Vous DEVEZ avoir une LICENCE d'ISDE ou le consentement exprès d'un titulaire de licence d'ISDE pour utiliser cet appareil.

1.2.2 RF Radiation Exposure

This equipment complies with RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of **UL: 90 cm, DL: 100 cm** between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. RF exposure will be addressed at time of installation and the use of higher gain antennas require larger separation distances.

(UL: LDPA antenna Max. peak gain: 9 dBi, DL: Omni directional antenna Max. peak gain: 3.5 dBi)

L'antenne (ou les antennes) doit être installée de façon à maintenir à tout instant une distance minimum de au moins **UL: 90 cm, DL: 100 cm** entre la source de radiation (l'antenne) et toute personne physique. Cet appareil ne doit pas être installé ou utilisé en conjonction avec une autre antenne ou émetteur.

(UL: LDPA antenna Max. peak gain: 9 dBi, DL: Omni directional antenna Max. peak gain: 3.5 dBi)

Information in this document is subject to change without notice.

Contact Information

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2. General Information

This document is primarily written for those who are new to 700/800 2.5W BDA system and wish to tune up the equipment. The document is applicable to below products from DKK.

2.1 Repeater Information (FCC & ISED ID)

CERTIFICATION	TYPE	ID	NOTES
FCC	B9A	2BKJD-IT109B017-UA	
	B9B	2BKJD-IT109B017-UB	
ISED	B9A	32982-IT109B017CA	
	B9B	32982-IT109B017CB	

2.2 Purpose

700/800 2.5W BDA is a system that generally supports public safety wireless services indoors, and is necessary for first aid workers and firefighters to communicate with each other in emergencies and normal situations.

700/800 2.5W BDA is a digital repeater that supports 700MHz band and 800MHz band. Bandwidth varies based on FPGA, and up to 32 channels can be selectively serviced through software through digital filter.

2.3 Advantages

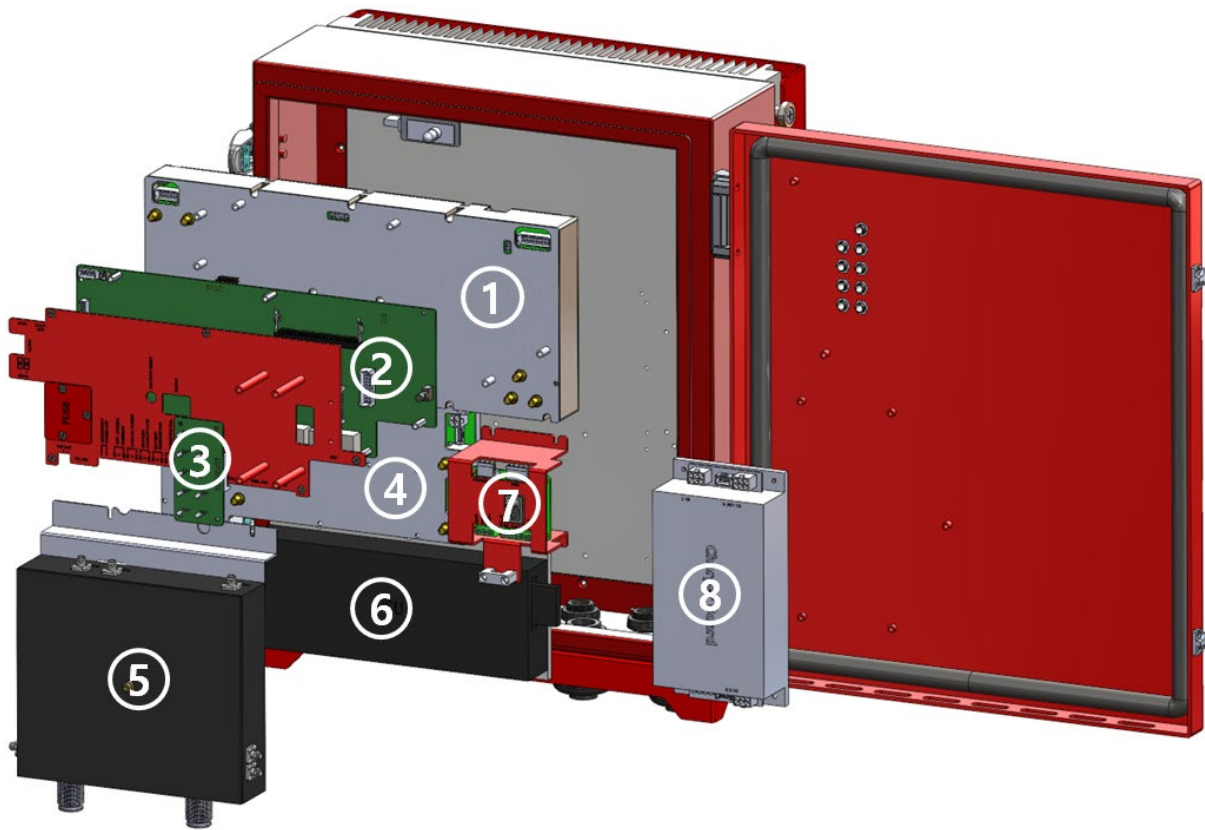
- 700MHz/800MHz Dual Band
- 4 Channels Class B Filter per Band
- LED for Status Check
- Automatic Gain Control
- DL/UL Squelch
- Oscillation Detection
- Isolation Check
- Auto Shutdown
- Donor antenna malfunction and donor antenna disconnect
- Support Web GUI and SNMP v3.0

2.4 Exterior



No.	PARAMETER	DESCRIPTION	NOTES
1	DONOR	Donor antenna port	4.3-10 Mini DIN
2	SERVICE	Service antenna port	4.3-10 Mini DIN
3	ACCESSORY	RF, DC power and communication interface for DAS	Liquid Tight Conduit Fittings (3/4 inch)
4	ALARM RELAY	Provide wired connection to alarm	Liquid Tight Conduit Fittings (3/4 inch)
5	110-220VAC	AC power incoming	Liquid Tight Conduit Fittings (1/2 inch)
6	BATTERY	24VDC external battery power incoming and battery charging	Liquid Tight Conduit Fittings (1/2 inch)
7	ANNUNCIATOR	Provide power and alarm signaling to a remote annunciator	Liquid Tight Conduit Fittings (1/2 inch)
8	GUI	Communications with a network	RJ-45

2.5 Interior



No.	PARAMETER	DESCRIPTION	NOTES
1	RFM & DTU	RF board, digital board and PAMs are built in	Top: RF board Bottom: DTU, PAM
2	WEB GUI/ALARM Board	Web GUI and alarm functionality integrated into one board	
3	LED	Display of system and alarm state	9 LEDs
4	HPA	High power amplifier	
5	Triplexer	700 DL, 800 DL, UL band pass filter	
6	PSU	AC/DC converter	
7	Power Switch Board	AC power ON/OFF	
8	Charger Module	Provides battery charging and DC power	

3. Specifications

3.1 Frequency Range

SERVICE BAND	DOWNLINK [MHz]			UPLINK [MHz]		
	LOW	CENTER	High	LOW	CENTER	High
700MHz (US)	758	763	768	788	793	798
	769	772	775	799	802	805
700MHz (CANADA)	758	767	776	788	797	806
800MHz (US)	851	856	861	806	811	816
800MHz (CANADA)	866	867.5	869	821	822.5	824

3.2 RF Specifications

PARAMETER		DOWNLINK	UPLINK
Output Power	700MHz	34dBm	27dBm
	800MHz	34dBm	27dBm
Input Dynamic Range		-56dBm ~ +4dBm	-53dBm ~ +7dBm
Gain Range		30dB ~ 90dB	20dB ~ 80dB
Gain Adjustment Range per CH		30dB/1.0dB steps	
Gain Adjust Accuracy		±1dB	
Input AGC Dynamic Range		60dB	
Max RF Input Power without Overdrive		-10dBm	-10dBm
Max RF Input Power without Damage		0dBm	+10dBm
Noise figure		6dB Max @ Max Gain	
Pass Band Ripple		3dB peak to peak	
Number of Channel Filter	Class B	4 Channel	
Filter Bandwidth	Class B	0.1MHz, 0.15MHz, 0.25MHz, 0.5MHz, 1MHz, 2MHz, 3MHz, 7MHz, 10MHz	
Delay	Class B	≤ 16.5us @ 100kHz	
		≤ 16.5us @ 150kHz	
		≤ 16.5us @ 0.25MHz	
		≤ 9.5us @ 0.5MHz	
		≤ 9.5us @ 1MHz	
		≤ 7.8us @ 2MHz	

		$\leq 7.8\mu s @ 3MHz$
		$\leq 7.8\mu s @ 7MHz$
		$\leq 7.8\mu s @ 10MHz$
Roll Off	Class B	$\geq 60dBc @ Fc\pm 260kHz (BW 100kHz)$
		$\geq 60dBc @ Fc\pm 285kHz (BW 150kHz)$
		$\geq 60dBc @ Fc\pm 335kHz (BW 0.25MHz)$
		$\geq 60dBc @ Fc\pm 750kHz (BW 0.5MHz)$
		$\geq 60dBc @ Fc\pm 1MHz (BW 1MHz)$
		$\geq 60dBc @ Fc\pm 1.75MHz (BW 2MHz)$
		$\geq 60dBc @ Fc\pm 2.25MHz (BW 3MHz)$
		$\geq 60dBc @ Fc\pm 4.5MHz (BW 7MHz)$
		$\geq 60dBc @ Fc\pm 6MHz (BW 10MHz)$
EVM		$\leq 4.0\% @ P25$ phase 1 and phase 2 modulation
DL/UL Squelch Threshold		-90~-50dBm @ Per B Channel, must have a disable
VSWR		$\leq 1.5:1$
Spurious		$\leq -13dBm$ (FCC Title 47 Part 90.219)
Characteristic Impedance		50 Ω

3.3 Mechanical Specifications

PARAMETER	DESCRIPTION	NOTES
Dimensions (H x W x D)	378 x 420 x 178mm	
Weight	$\leq 22kg$	
Operating Voltage	110VAC, 50/60Hz	
Power Consumption	$\leq 130W$	
Operating Temperature	-30 ~ +50°C	
Operating Humidity	$\leq 95\%$	
Enclosure Cooling	Convection	
Enclosure Class	IP65 / NEMA 4X	