UDM-240ZBV,ZV

Service Manual

※ BEFORE USING THIS…

♣ Please read this manual in detail before using the device. (Please read and understand the manual before using this equipment)

♣ Features can be subject to change or modify without any prior notice for its improvement of performance (better performance)

♣ Pictures on this manual may differ from the actual products.

♣ Please contact our local agency or Unimo A/S division directly if you have any questions.

Safety Precautions

This content is for user's safety and property. Please read it and fully understand.

Details affect to its performance and appearance

Please use recommended voltage for input power supply voltage.

Adapter, external ear-phones are designed to be used for Unimo product only. Using non-Unimo goods can cause damage or malfunction to the product.

Please use communication purpose only.

Please do not disassemble or modify the product.
Damage or malfunction caused by those, won't be repaired free of charge.

※ Avoid severe impact to the product.

※ Please keep avoid being exposed to direct sunlight or high temperatures and a lot of humidity

Details affect to the operation of radios or other equipments.

Communication range can be shortened near the products using 2.4GHz due to interference of electric wave.

(Microwave, Wi-Fi, Computer, other equipment using 2.4GHz,… etc.)

Turn off the radio on airplane. Please follow the instructions or rules when you use it.

Please check whether can use or not before using the radio the due to electronic effect.

Do not use the radios near electronic equipments such as Wi-Fi or computers. Radios may does not work properly due to strong interference.

※ Electromagnetic waves in a variety of electrical and electronic equipment can be occurred. The influence of electromagnetic interference is generated. Distance calls can also be shortened remarkably.

Safety Requirement

Please read the following information about safe and effective use of the product.

Keep your distance at least 1 inch(2.5cm) from your body when you use the radios.

Make sure the regulations regarding the use of radio while driving, please do not use the radios as much as possible while you drive.
Use additional accessories, such as earphones, for your safety.

Do not listen at very high volume. Your hearing may be affected.

For use in hazardous areas, only explosion-proof device must be used. If an electrical spark pops up in hazardous areas, it can cause severe burns or death.

Turn it off around the workplaces, causing an explosion of electromagnetic behavior of the product. e

1 FEATURES

UDM-240ZH is designed to have light and durable structure and it provides a powerful sound.

It is the first product using 2.4GHz band developed in Korea and provides a clear digital sound.

It is designed to provide adequate service for industrial products, public safety users.

It also provides clear digital radio communication between the UDM-240ZV and can be operated with the existing VHF, UHF, TETRA vehicle and base station if it's interfaced with them.

- **16 Channels (11~26)**
- **Perfect security. (AES 128bit)**
- **3 levels of audio adjustment**
- **Application of high sensitivity of external antenna**
- **Designation of group ID up to 64,000**
- **1 to N communication (per Channel/ Group ID)**

2 COMPONENTS

Basic components

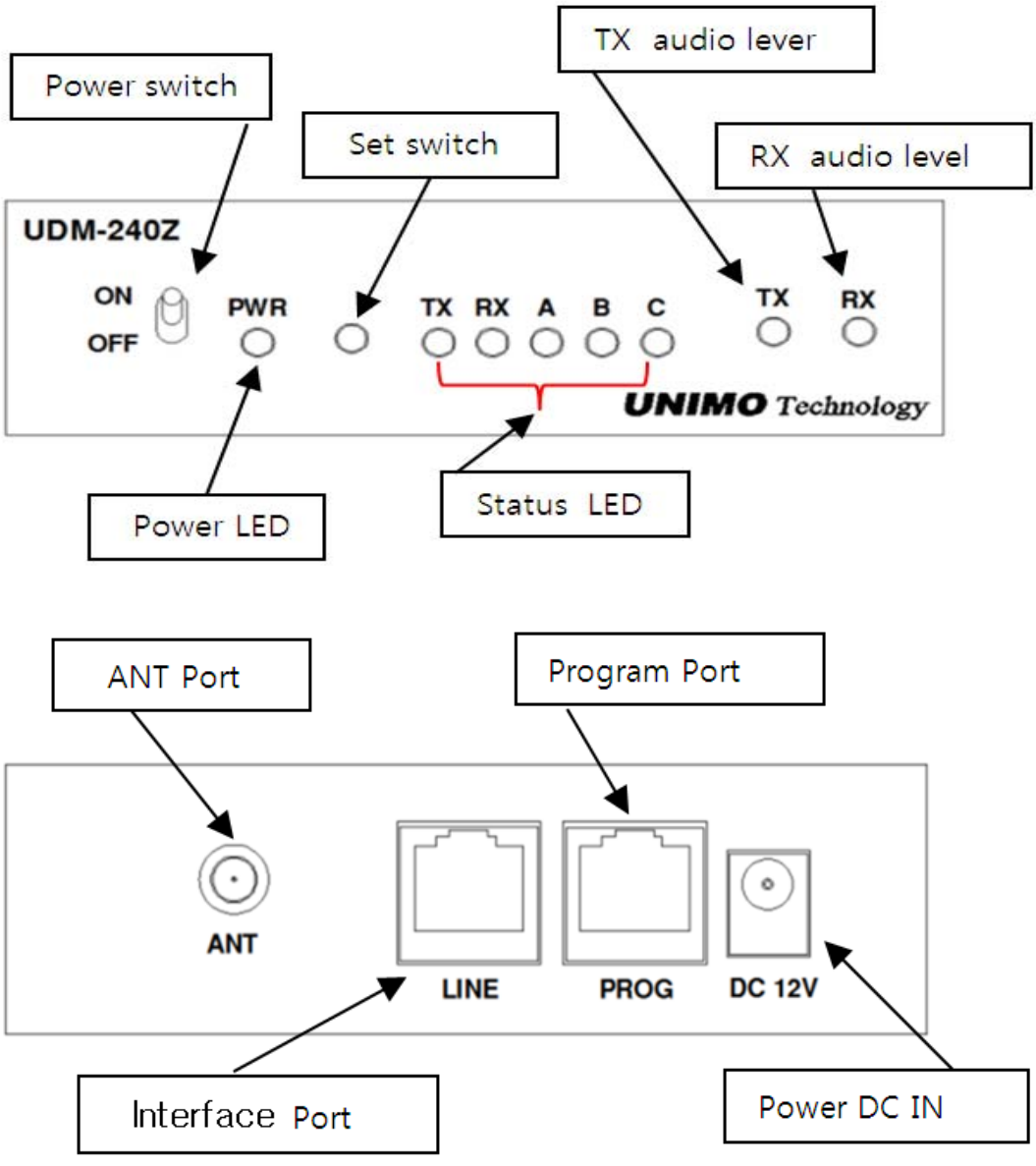
- **Main unit, External antenna, Interface cable, Power supply, User manual, Interface manual**

Optional components

- **Programming software**
- **USB PC Programming cable**

***** Components can be changed according to the request.**

3 DESCRIPTION



Power On/Off switch

Supply or shut the main power to the unit.

Set switch

Enables user to set operating channel and audio level.

ANT port

Connect the external antenna to this port.

LINE port

Connect the interface cable to a mobile radio you are going to use.

PROG port

It is a port for upgrading the firmware of the device. (for engineer)

DC IN

Supply power to the main unit. (UDM-240ZV : 12V~13.8V, UDM-240ZBV : 12V~40V)

Status Display

LED

The users can be recognized the current status by LED indicator on the top of the UDM.

The status indication will be as followings.

- **PWR : red LED will be on if the power is being supplied**
- **TX : it indicates the receiving status of the device and red LED will be on while transmitting through a mobile radio connected to the device.**
- **RX : It indicates the transmitting status of the device and green LED will be blinking while receiving through a mobile radio connected to the device.**
- **A : It indicates operating channel and audio level.(amber LED)**
- **B : It indicates operating channel and audio level.(green LED)**
- **C : It indicates operating channel and audio level.(red LED)**

4 HOW TO SET FOR OPERATION

4.1 Power ON/OFF

- **Turn the device on by the power switch.**

4.2 Operating channel

Press the setup switch for more than 3 seconds and select the channel according to the below table. After select the channel, if you press the setup switch for 3 seconds again, all the LED will be blinking once and the selected channel will be confirmed.

RX(Green)	A(Yellow)	B(Green)	C(Red)	CH
				11 CH
				12 CH
				13 CH
				14 CH
				15 CH
				16 CH
				17 CH
				18 CH
				19 CH
				20 CH
				21 CH
				22 CH
				23 CH
				24 CH
				25 CH
				26 CH

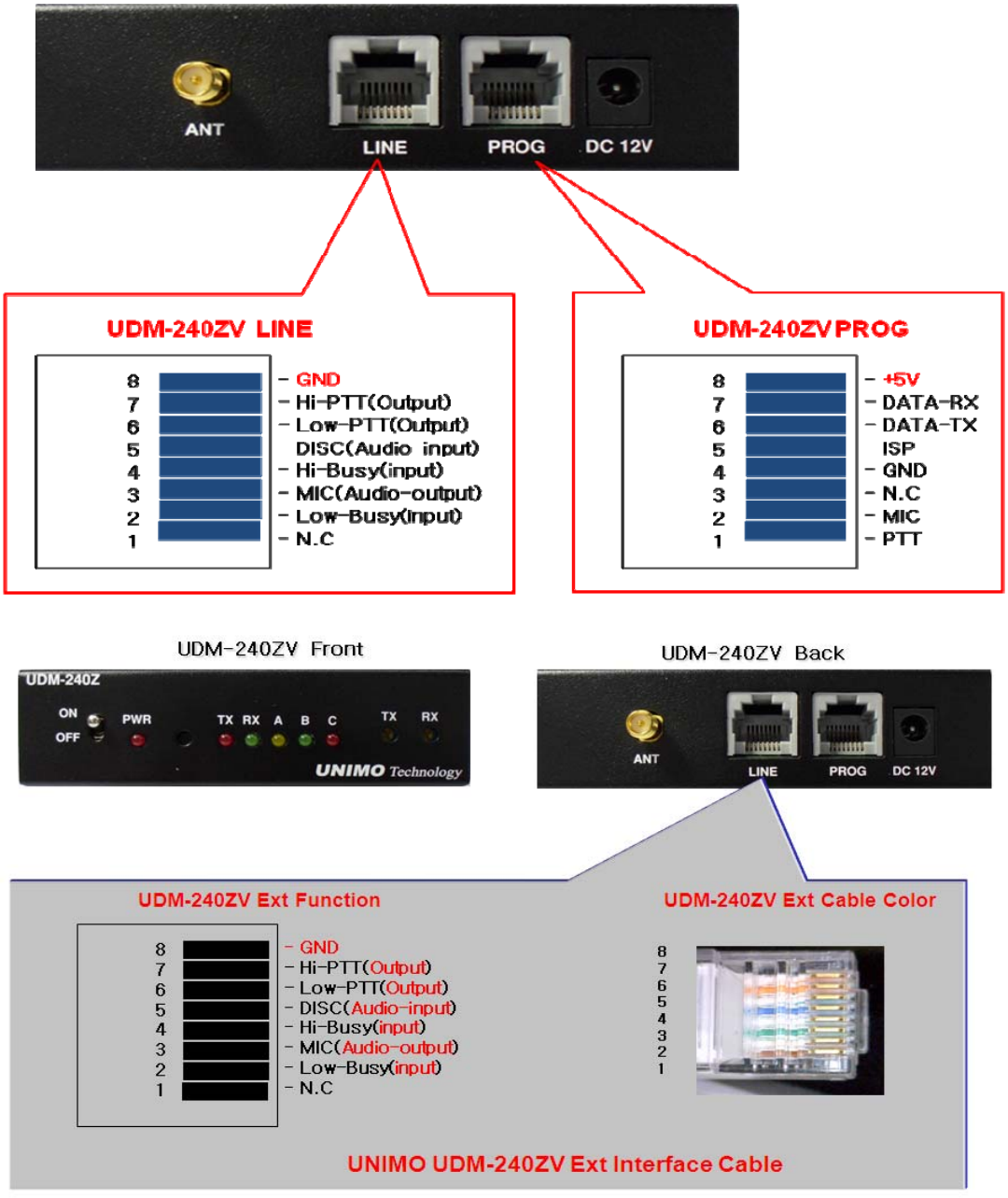
4.3 Audio Level

TX,RX AUDIO LEVEL SETTING

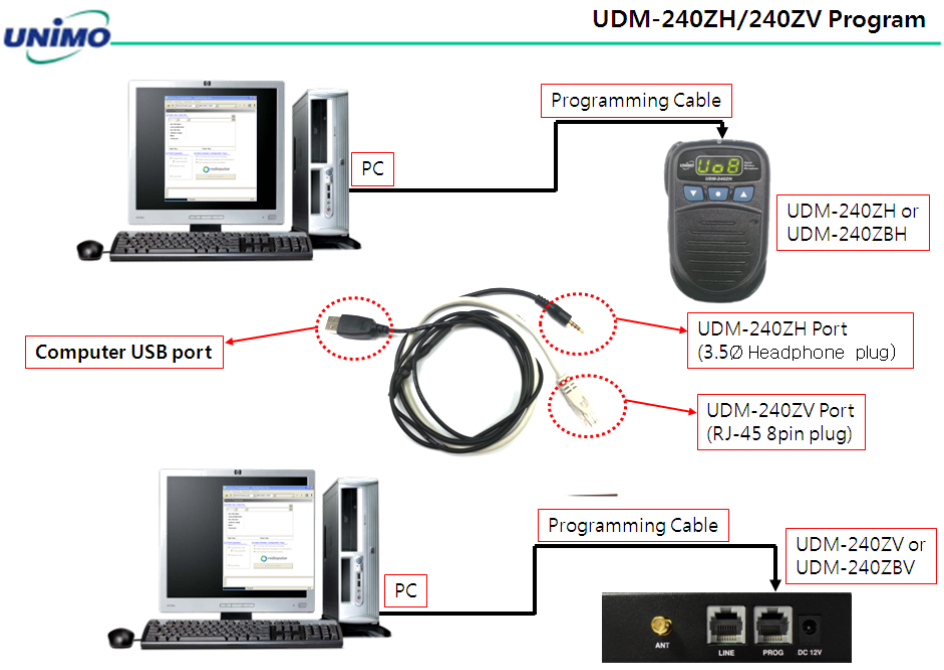
Level change	**While pressing the setup switch, turn the UDM-240ZV on and keep pressing the switch for more than 3 seconds. Then, four LED(PWR,A,B,C) will be blinking once and current level of LED will be on.** **Select the level by pressing the setup switch and press it again for 3 seconds to save the level you select. Then, the four LED will be blinking once again and the level will be saved.**

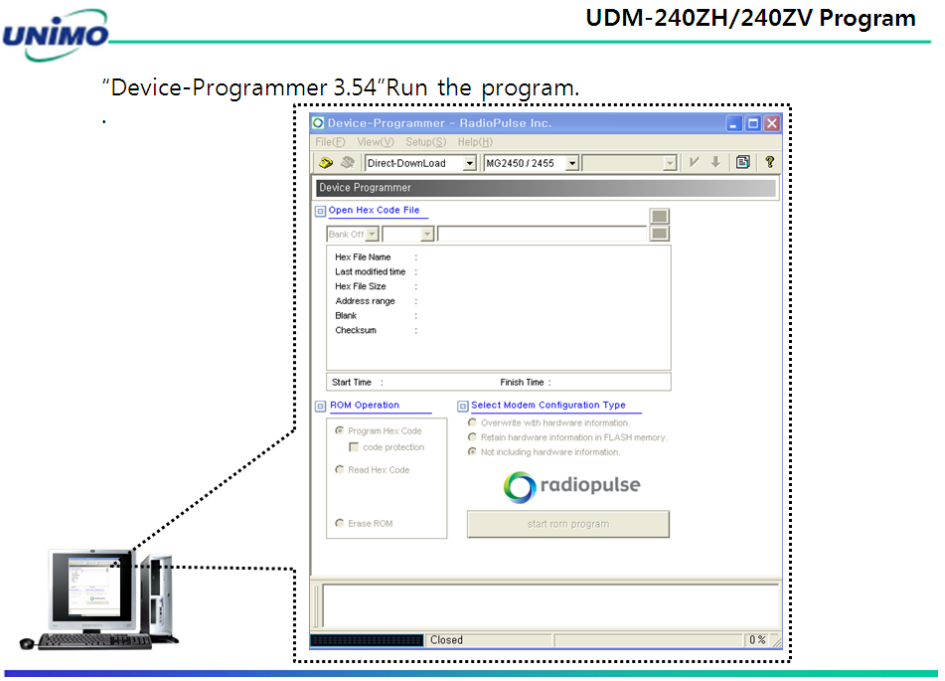
5 INTERFACE

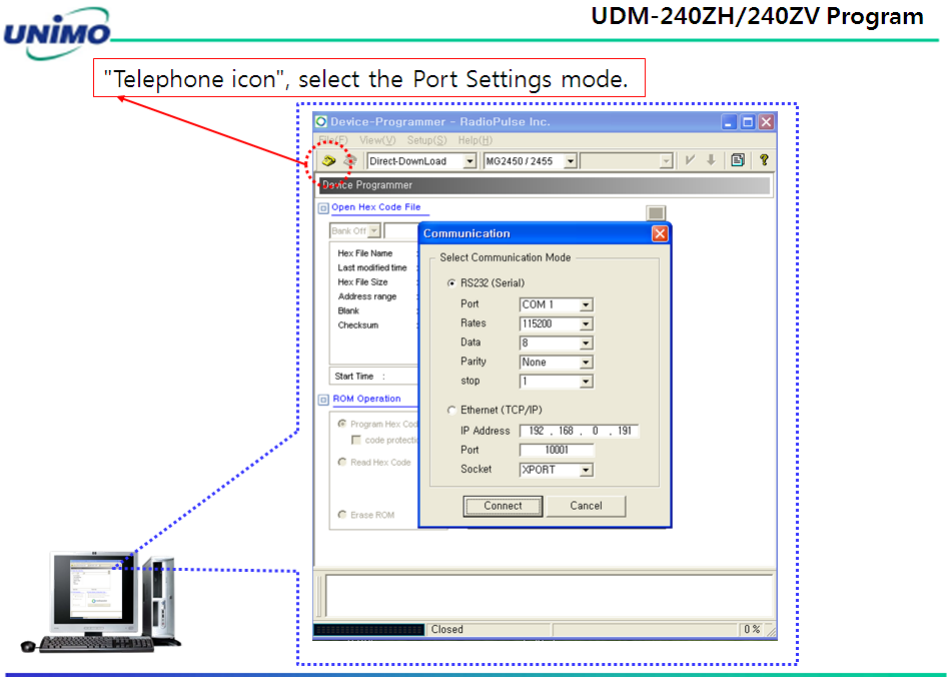
Line Port: Connection with an external port

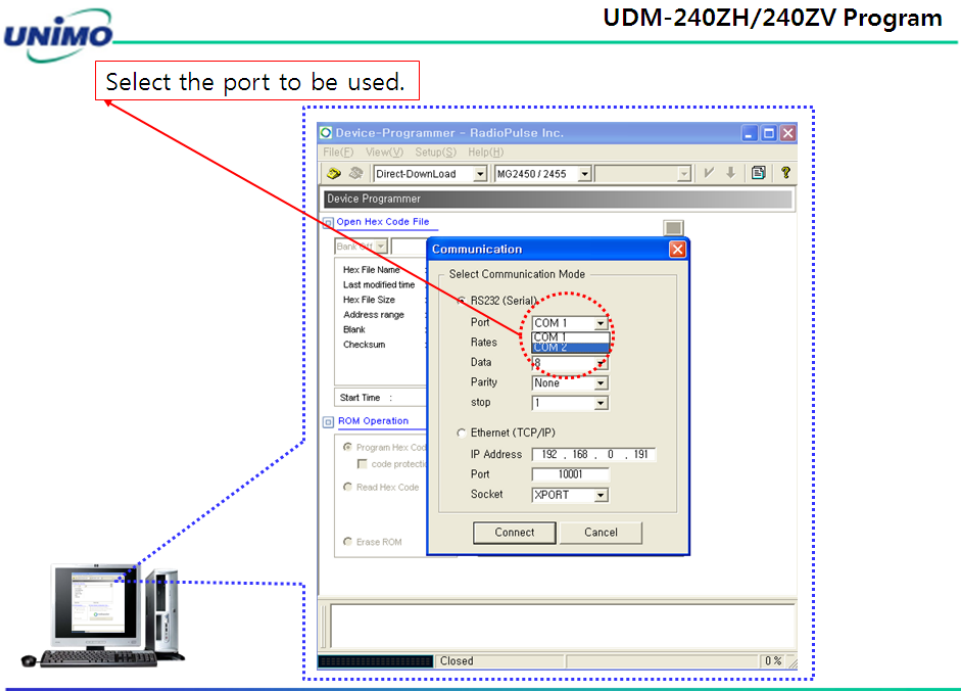


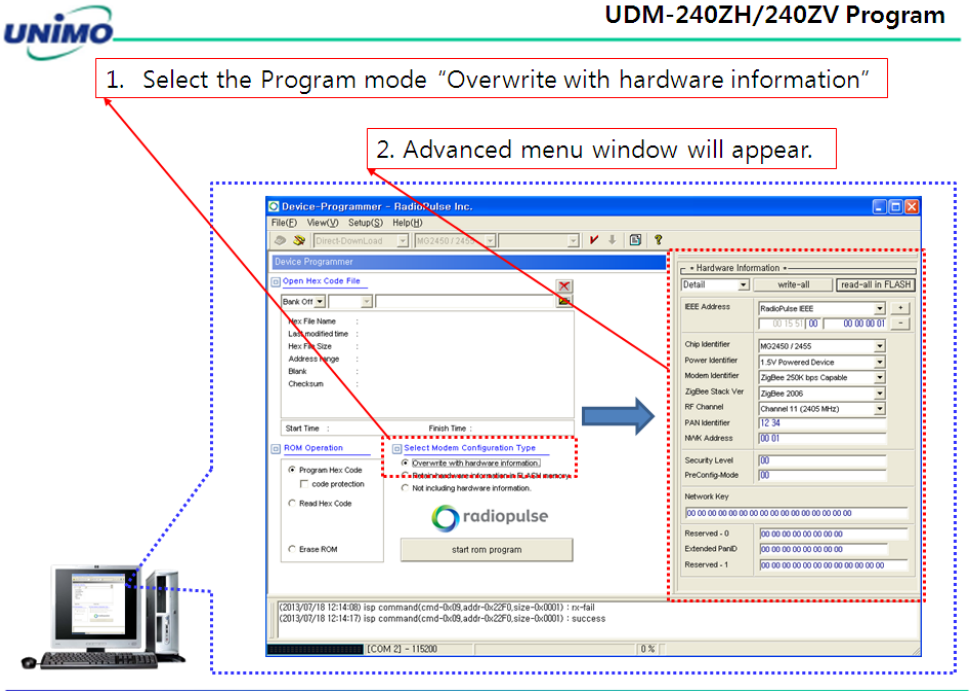
PROG port


UDM-240ZH/240ZV Program
Programming Cable
PC
UDM-240ZH or
UDM-240ZBH
Computer USB port
UDM-240ZH Port
(3.5Ø Headphone plug)
UDM-240ZV Port
(RJ-45 8pin plug)
Programming Cable
UDM-240ZV or
UDM-240ZBV
PC
ANT
LINE
PROG
DC 12V


UDM-240ZH/240ZV Program
"Device-Programmer 3.54"Run the program.
Device-Programmer - RadioPulse Inc.
File(F) View(V) Setup(S) Help(H)
Direct-DownLoad
MG2450 / 2455
Device Programmer
Open Hex Code File
Hex File Name
Last modified time
Hex File Size
Address range
Blank
Checksum
Start Time
Finish Time
ROM Operation
Program Hex Code
code protection
Read Hex Code
Erase ROM
Select Modem Configuration Type
Overwrite with hardware information.
Retain hardware information in FLASH memory.
Not including hardware information.
radiopulse
start rom program
Closed
0 %

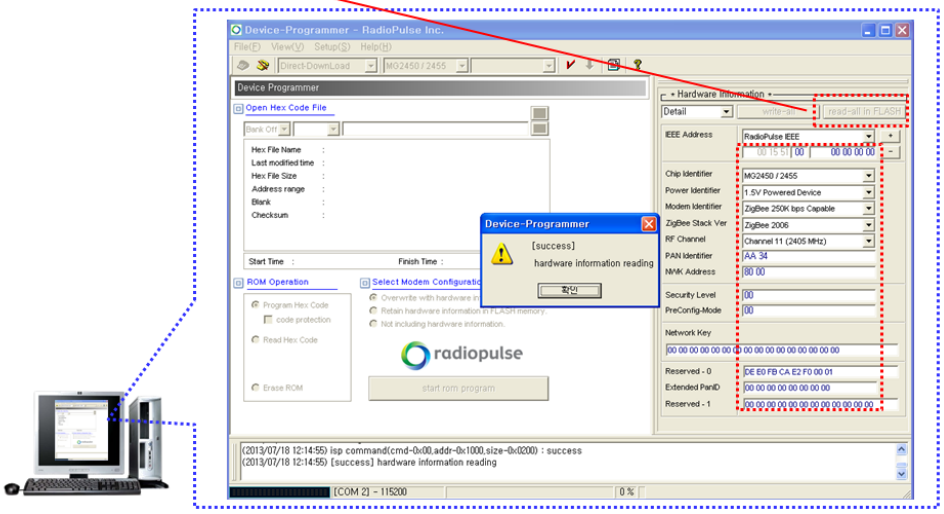

UDM-240ZH/240ZV Program
"Telephone icon", select the Port Settings mode.
Device-Programmer - RadioPulse Inc.
Communication
Select Communication Mode
RS232 (Serial)
Port
COM 1
Rates
115200
Data
8
Parity
None
stop
1
Ethernet (TCP/IP)
IP Address
192 . 168 . 0 . 191
Port
10001
Socket
XPORT
Connect
Cancel
Closed

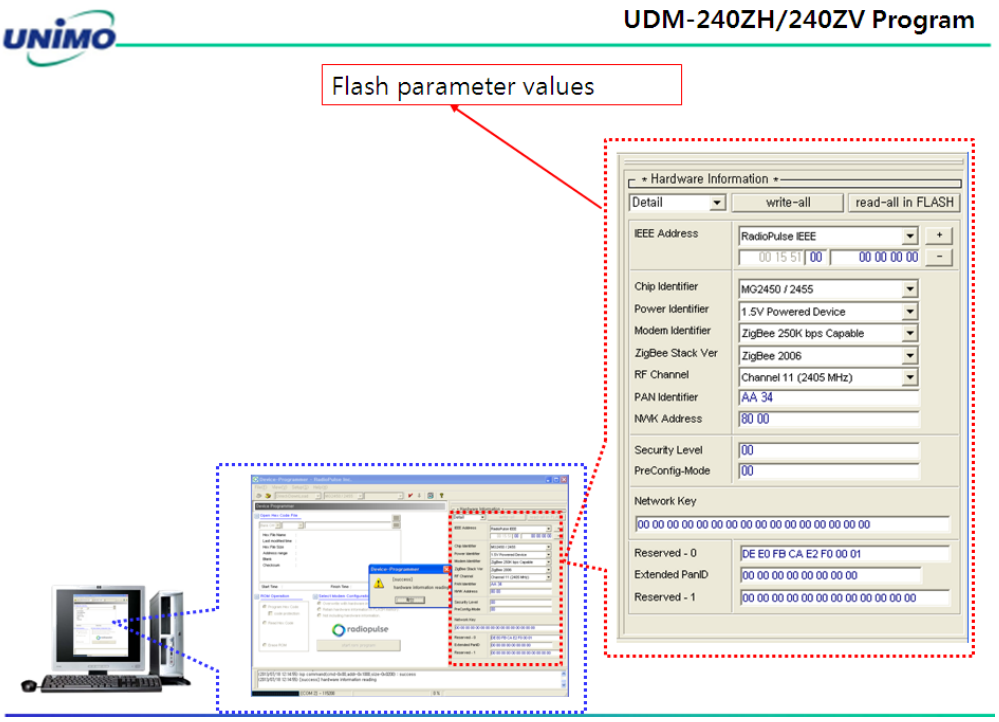

UDM-240ZH/240ZV Program
Select the port to be used.
Device-Programmer - RadioPulse Inc.
Communication
Select Communication Mode
RS232 (Serial)
Port
COM 1
COM 1
COM 2
Rates
Data
Parity
None
stop
1
Ethernet (TCP/IP)
IP Address
192 . 168 . 0 . 191
Port
10001
Socket
XPORT
Connect
Cancel
Closed

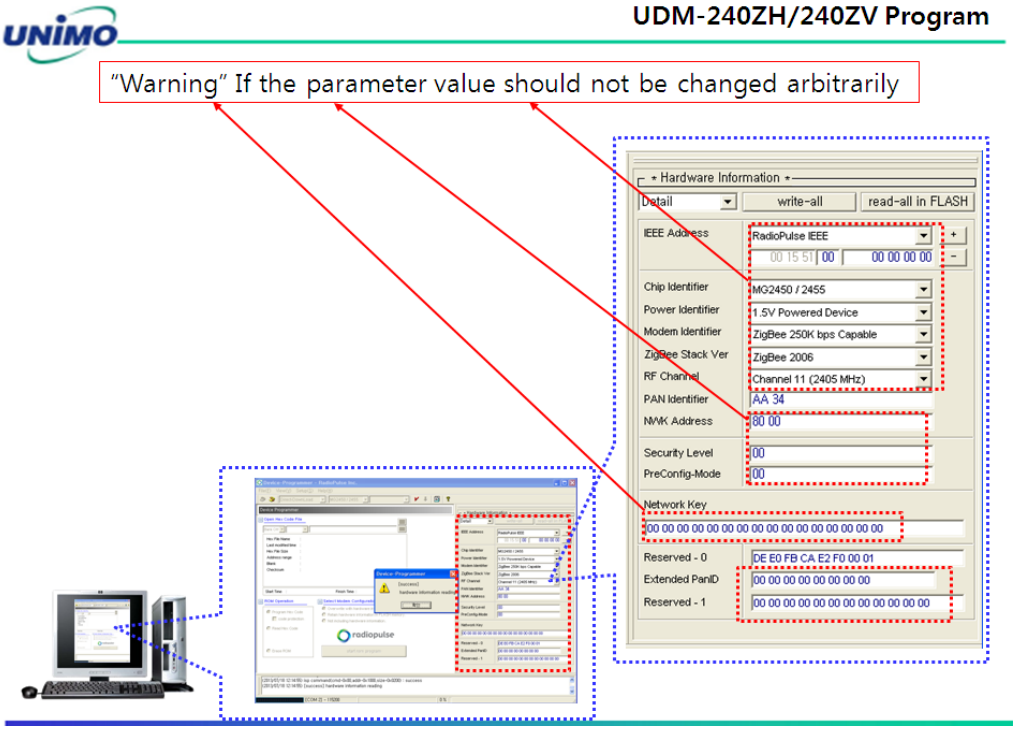

UDM-240ZH/240ZV Program
1. Select the Program mode "Overwrite with hardware information"
2. Advanced menu window will appear.
Device-Programmer - RadioPulse Inc.
File(F) View(V) Setup(S) Help(H)
Device Programmer
Open Hex Code File
Hardware Information
Detail
write-all
read-all in FLASH
IEEE Address
Chip Identifier
Power Identifier
Modem Identifier
ZigBee Stack Ver
RF Channel
PAN Identifier
NWK Address
Security Level
PreConfig-Mode
Network Key
Reserved - 0
Extended PanID
Reserved - 1
ROM Operation
Program Hex Code
code protection
Read Hex Code
Erase ROM
Select Modem Configuration Type
Overwrite with hardware information.
Not including hardware information.
radiopulse
start rom program
(2013/07/18 12:14:08) isp command(cmd-0x09,addr-0x22F0,size-0x0001) : rx-fail
(2013/07/18 12:14:17) isp command(cmd-0x09,addr-0x22F0,size-0x0001) : success
[COM 2] - 115200
0 %

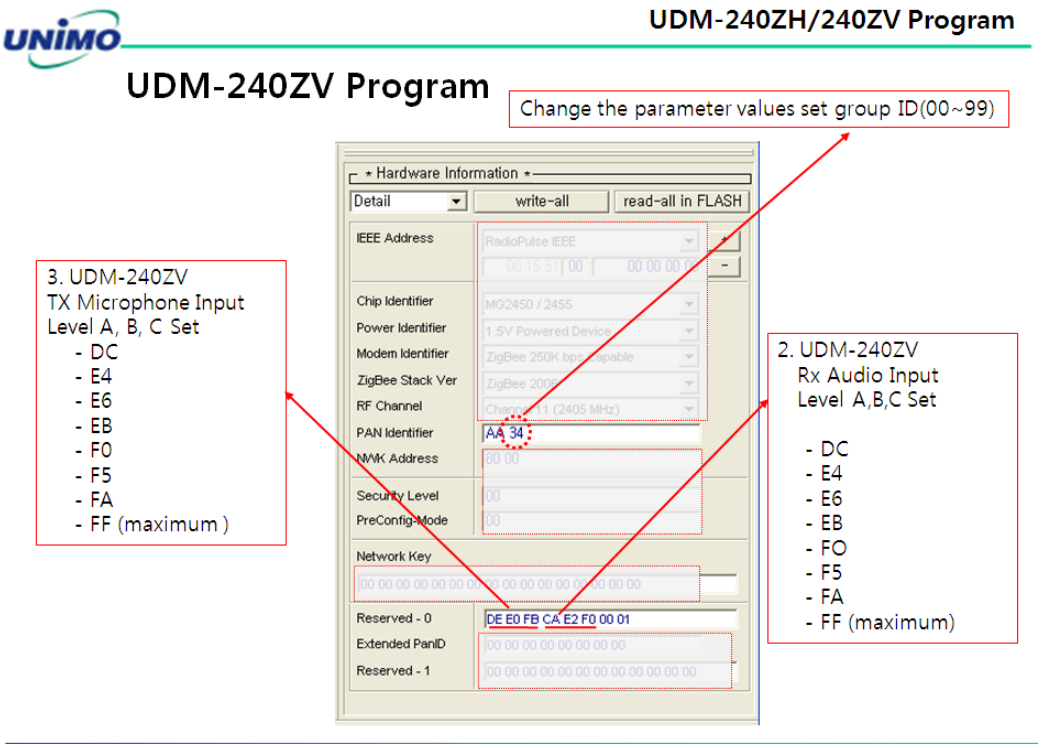
UDM-240ZH/240ZV Program

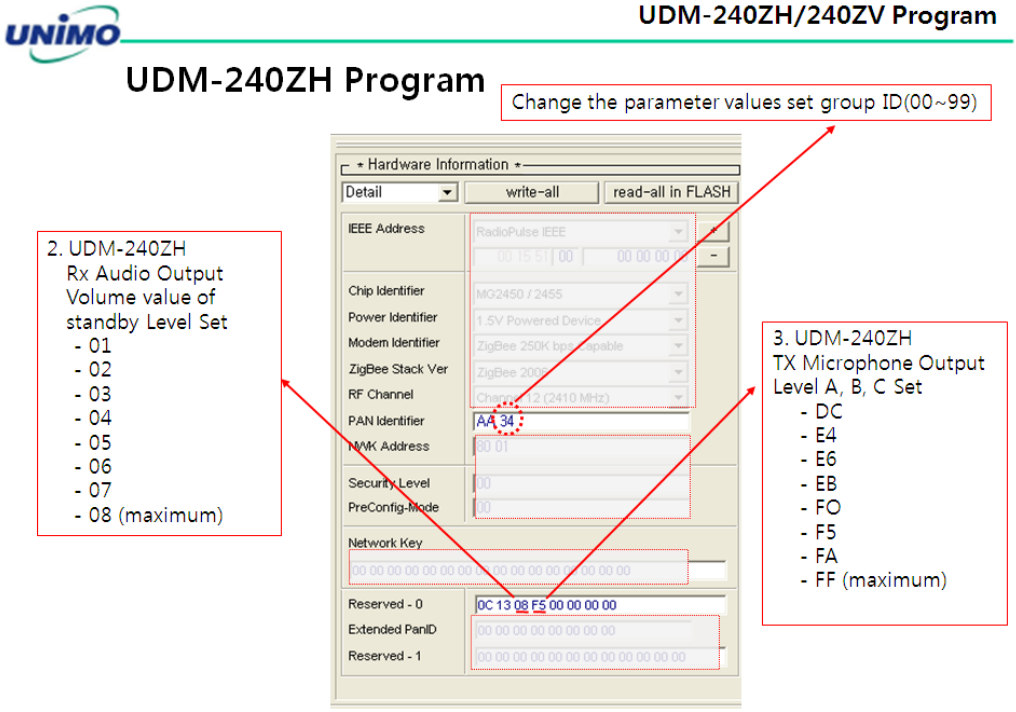
1. "read-all in FLASH" The program reads the value of the products connected to

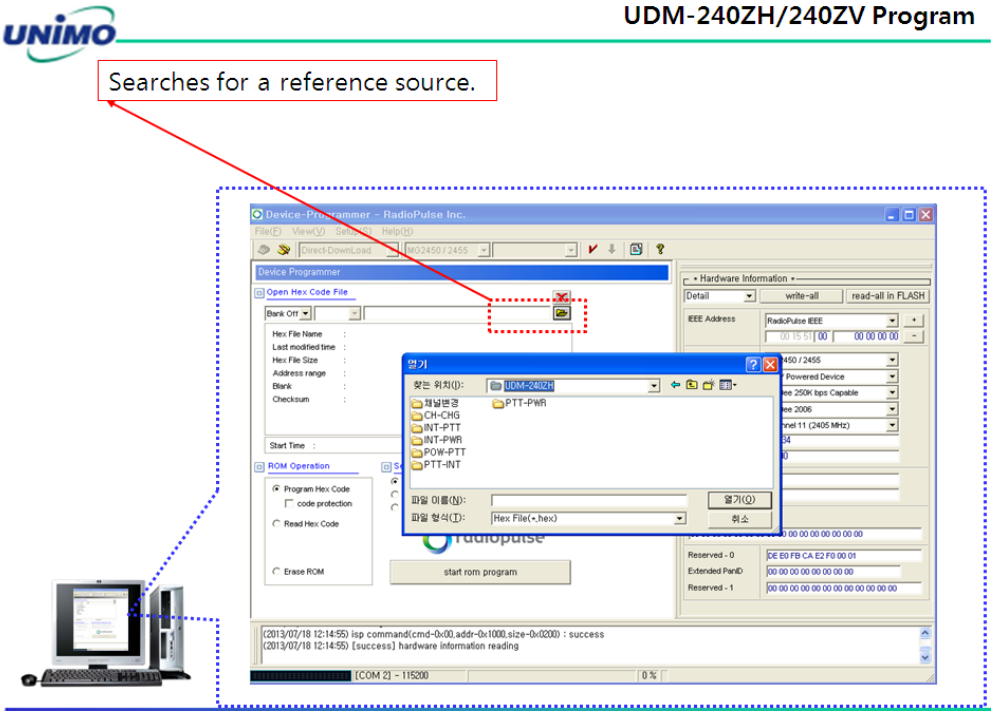


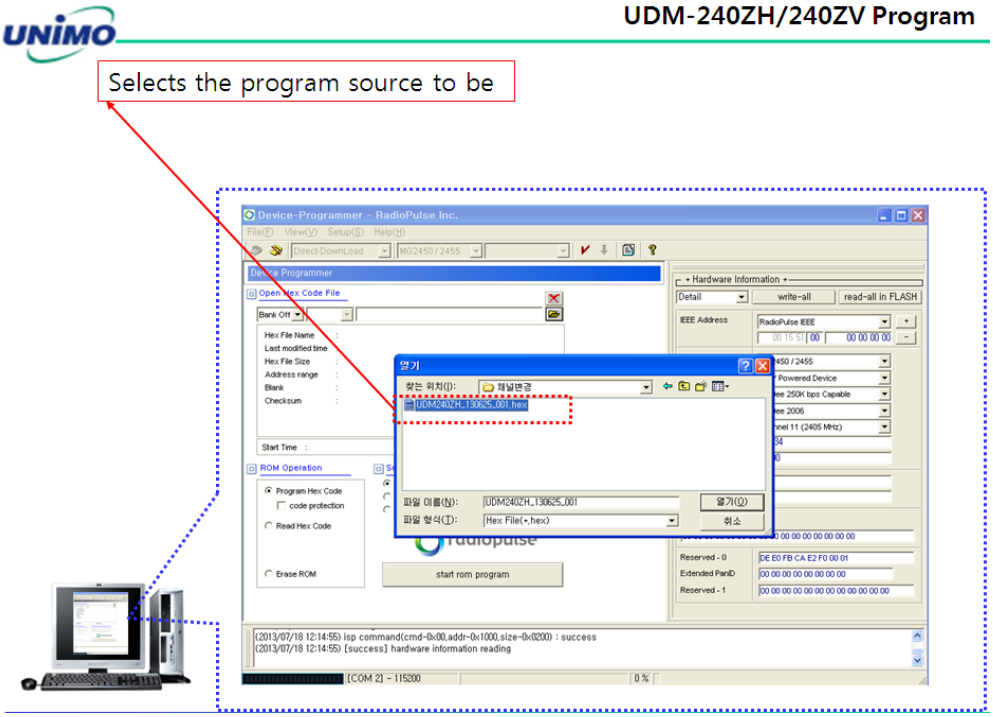

UDM-240ZH/240ZV Program
Flash parameter values
Hardware Information
Detail
write-all
read-all in FLASH
IEEE Address
RadioPulse IEEE
Chip Identifier
MG2450 / 2455
Power Identifier
1.5V Powered Device
Modem Identifier
ZigBee 250K bps Capable
ZigBee Stack Ver
ZigBee 2006
RF Channel
Channel 11 (2405 MHz)
PAN Identifier
AA 34
NWK Address
80 00
Security Level
00
PreConfig-Mode
00
Network Key
Reserved - 0
DE E0 FB CA E2 F0 00 01
Extended PanID
Reserved - 1

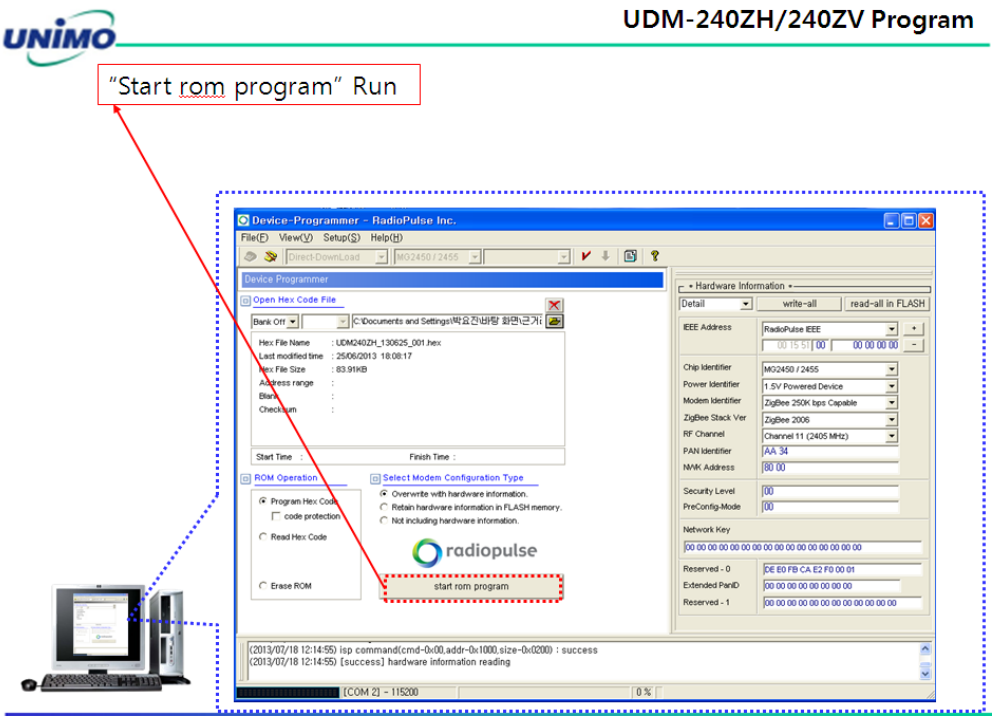

UDM-240ZH/240ZV Program
"Warning" If the parameter value should not be changed arbitrarily
Hardware Information
Detail
write-all
read-all in FLASH
IEEE Address
RadioPulse IEEE
Chip Identifier
MG2450 / 2455
Power Identifier
1.5V Powered Device
Modem Identifier
ZigBee 250K bps Capable
ZigBee Stack Ver
ZigBee 2006
RF Channel
Channel 11 (2405 MHz)
PAN Identifier
AA 34
NWK Address
80 00
Security Level
00
PreConfig-Mode
00
Network Key
Reserved - 0
DE E0 FB CA E2 F0 00 01
Extended PanID
Reserved - 1

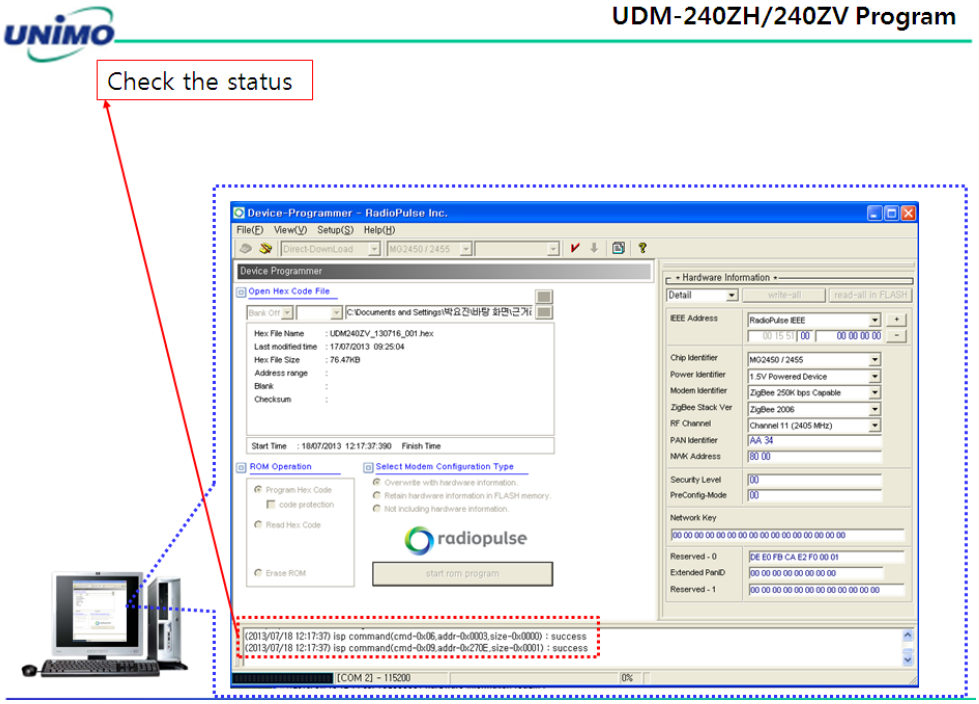

UDM-240ZH/240ZV Program
UDM-240ZV Program
Change the parameter values set group ID(00~99)
* Hardware Information *
Detail
write-all
read-all in FLASH
IEEE Address
RadioPulse IEEE
Chip Identifier
MG2450 / 2455
Power Identifier
1.5V Powered Device
Modem Identifier
ZigBee 250K bps capable
ZigBee Stack Ver
ZigBee 2006
RF Channel
PAN Identifier
AA 34
NWK Address
80 00
Security Level
00
PreConfig-Mode
00
Network Key
Reserved - 0
DE E0 FB CA E2 F0 00 01
Extended PanID
Reserved - 1
3. UDM-240ZV
TX Microphone Input
Level A, B, C Set
- DC
- E4
- E6
- EB
- F0
- F5
- FA
- FF (maximum)
2. UDM-240ZV
Rx Audio Input
Level A,B,C Set
- DC
- E4
- E6
- EB
- FO
- F5
- FA
- FF (maximum)


UDM-240ZH/240ZV Program
UDM-240ZH Program
Change the parameter values set group ID(00~99)
2. UDM-240ZH
Rx Audio Output
Volume value of
standby Level Set
- 01
- 02
- 03
- 04
- 05
- 06
- 07
- 08 (maximum)
3. UDM-240ZH
TX Microphone Output
Level A, B, C Set
- DC
- E4
- E6
- EB
- FO
- F5
- FA
- FF (maximum)
* Hardware Information *
Detail
write-all
read-all in FLASH
IEEE Address
Chip Identifier
Power Identifier
Modem Identifier
ZigBee Stack Ver
RF Channel
PAN Identifier
NWK Address
Security Level
PreConfig-Mode
Network Key
Reserved - 0
Extended PanID
Reserved - 1
0C 13 08 F5 00 00 00 00


UDM-240ZH/240ZV Program
Searches for a reference source.
Device-Programmer - RadioPulse Inc.
Device Programmer
Open Hex Code File
ROM Operation
Program Hex Code
code protection
Read Hex Code
Erase ROM
start rom program
* Hardware Information *
write-all
read-all in FLASH
열기
UDM-240ZH
PTT-PWR
CH-CHG
INT-PTT
INT-PWR
POW-PTT
PTT-INT
Hex File(*.hex)

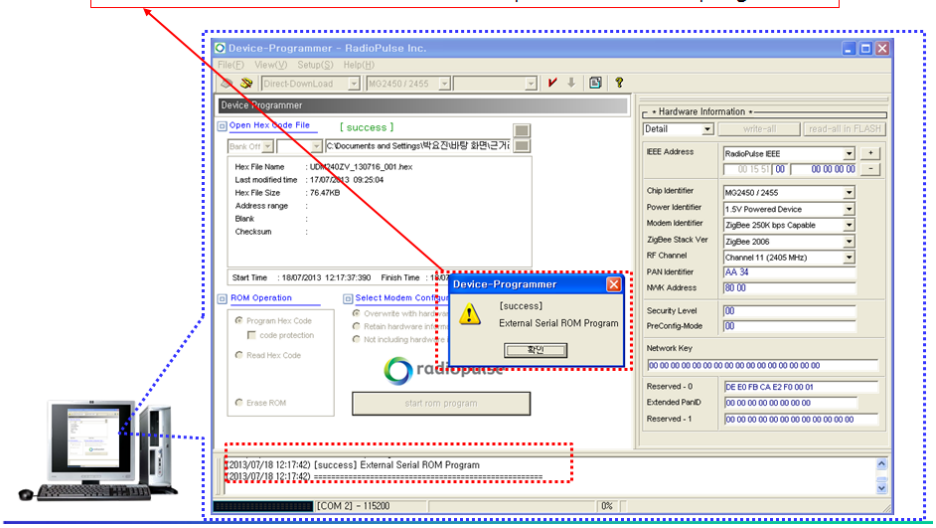

UDM-240ZH/240ZV Program
Selects the program source to be
Device-Programmer - RadioPulse Inc.
Device Programmer
Open Hex Code File
ROM Operation
Program Hex Code
code protection
Read Hex Code
Erase ROM
start rom program
Hardware Information
write-all
read-all in FLASH
열기
파일 이름(N):
파일 형식(T):
Hex File(*.hex)
열기(O)
취소


UDM-240ZH/240ZV Program
"Start rom program" Run
Device-Programmer - RadioPulse Inc.
start rom program


UDM-240ZH/240ZV Program
Check the status
Device-Programmer - RadioPulse Inc.
(2013/07/18 12:17:37) isp command(cmd-0x06,addr-0x0003,size-0x0000) : success
(2013/07/18 12:17:37) isp command(cmd-0x09,addr-0x270E,size-0x0001) : success

UDM-240ZH/240ZV Program

1. Click the "확인" button
2. Switch off the power supply to the product program
3. Disconnect the cable between the product and the program.

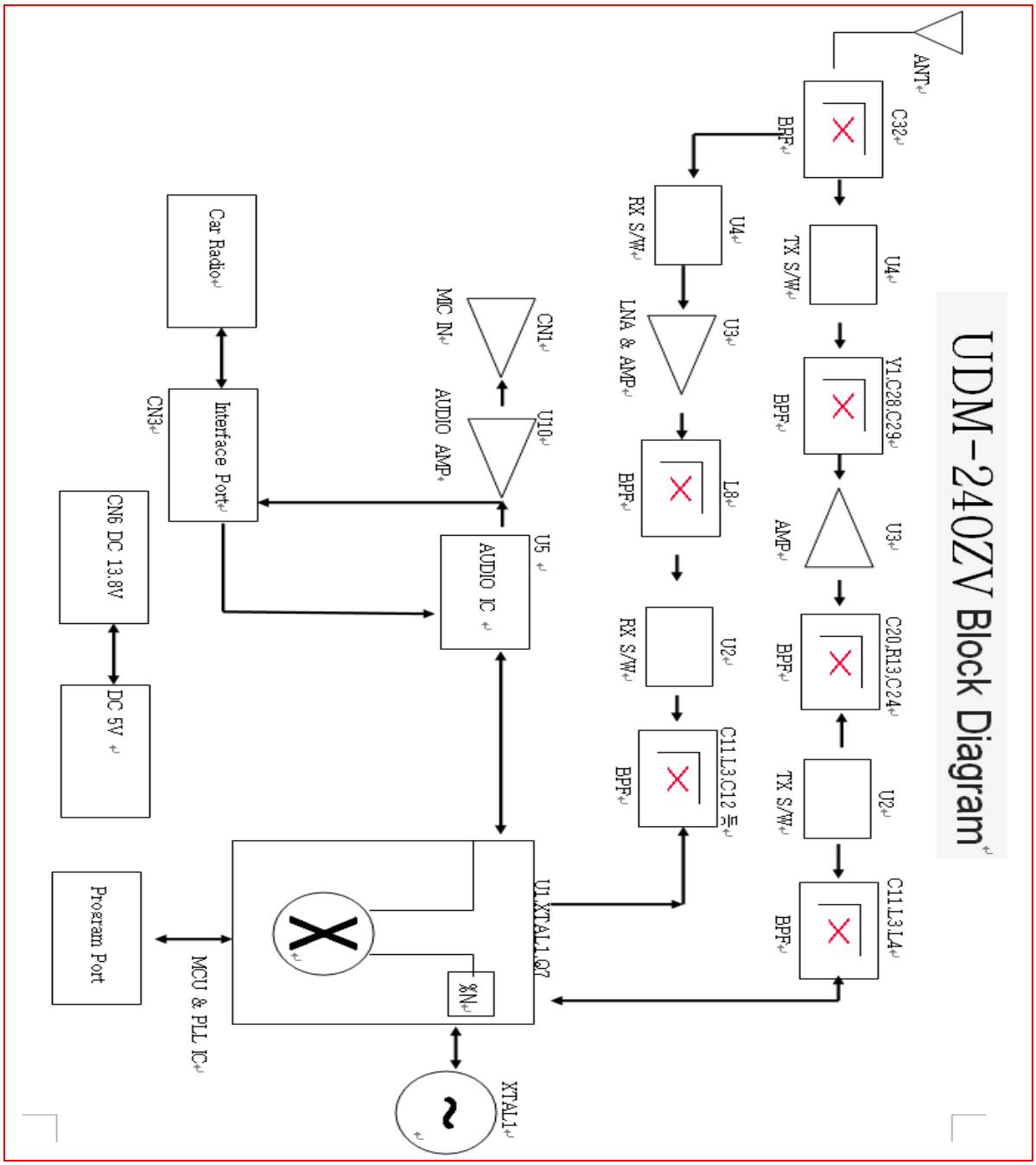


Functional differences between the version of the program

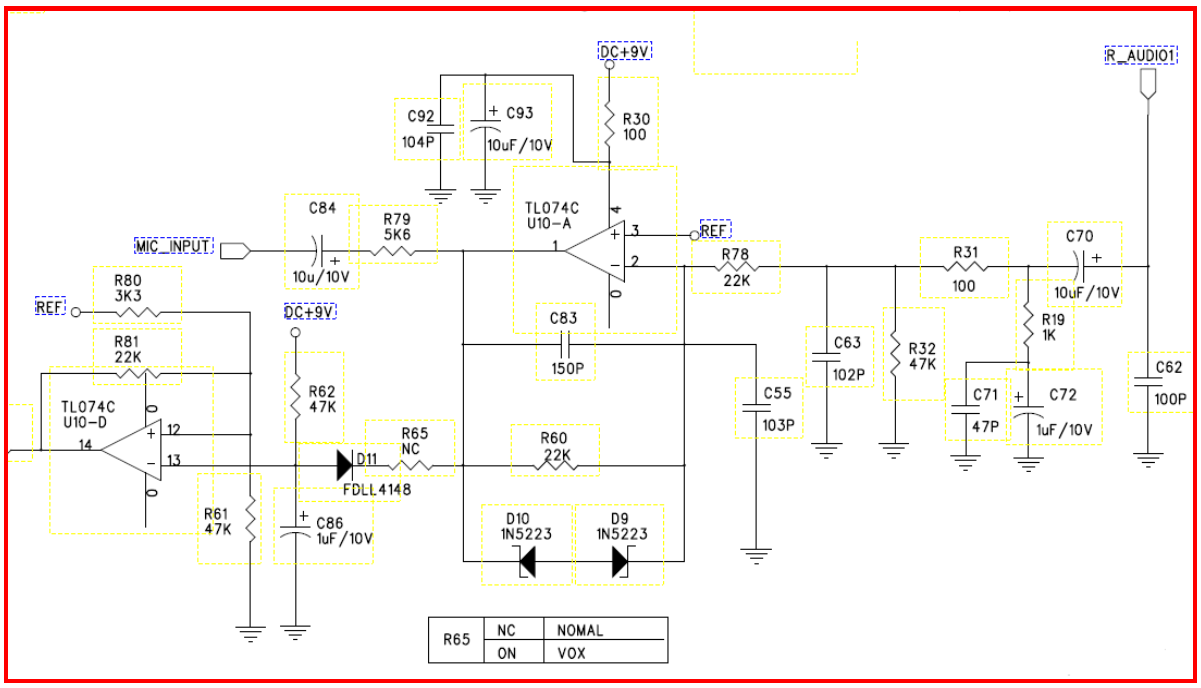
Model Name	Features	The source file name	
UDM-240ZV	Vehicle ,Base, Receive automatic, Check busy	UDM240ZV_V1_1_송신무선처리.hex	New
	Vehicle , Base, Receive automatic, Check VOX	UDM240ZV_VOX_level60_retry0.hex	신형
	Vehicle, Base, Check busy	UDM240ZV_노이즈개선_001.hex	New
UDM-240ZBV	Marine, Base, Receive automatic, Check busy	UDM240ZV_V1_1_송신무선처리.hex	New
	Marine, Base, Receive automatic, Check VOX	UDM240ZV_VOX_level60_retry0.hex	New
UDM-240ZH	Vehicle, Main- PTT, Sub-PTT	UDM240ZH_V2_1car_retry_0.hex	New
	Vehicle, Main- PTT, Sub-PTT, Automatic connection	UDM240ZH_V2_1car_retry_1.hex	New
	Vehicle, Main- PTT, Alarm Coverage	UDM240ZH_1308-INT.hex	Old
	Vehicle, Main- INT, Alarm Coverage	UDM240ZH_1308-PTT.hex	Old
UDM-240ZBH	Marine, Scan, INT-Toggle	UDM240ZH_V2_1boat_retry_0_Toggle_INT.hex	New
	Marine, Scan, INT-Push	UDM240ZH_V2_1boat_Allscan_retry_0_NoINT.hex	New
	Marine, Automatic connection, Scan, INT-Toggle	UDM240ZH_V2_1boat_retry_1_Toggle_INT.hex	New
	Marine, Automatic connection, Scan, INT-Push	UDM240ZH_V2_1boat_Allscan_retry_1_NoINT.hex	New
PZ-400SZ	PZ-400SZ Zigbee	PZ-400SZ(Zigbee)-UDM240_130225_0.hex	Old
	PZ-400SZ	PZ_Rev_03_24_200NW400_Zigbee.hex	Old

Please note that between the old and new version of the program, the UDM-240ZV[ZH] are not compatible each other.

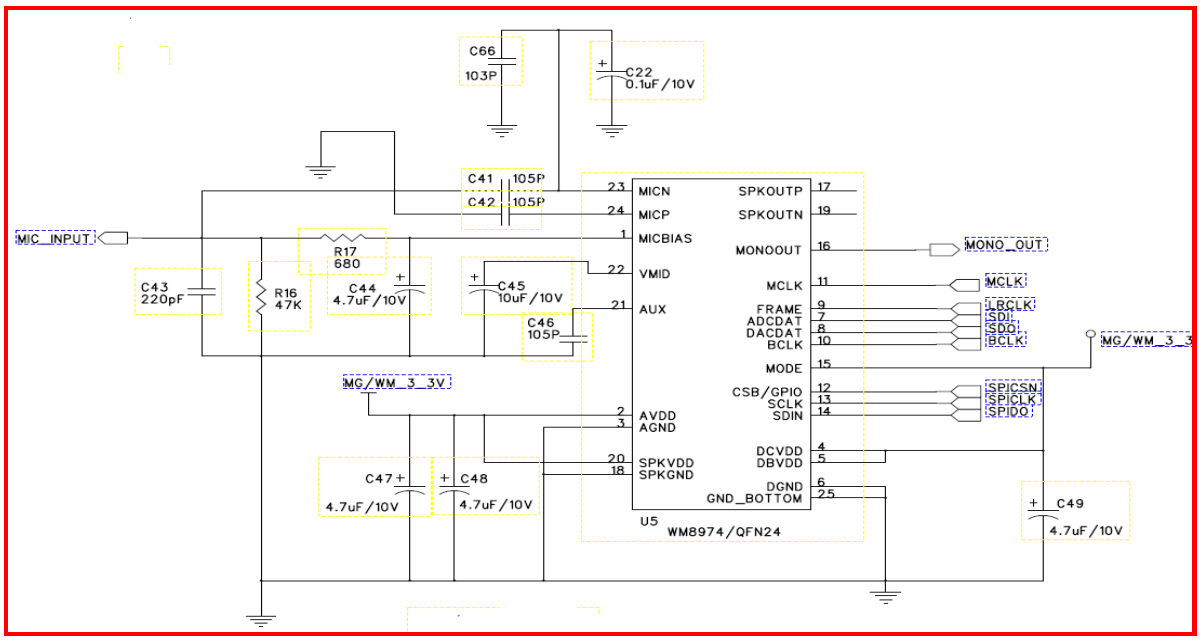
6 CIRCUIT DESCRIPTION



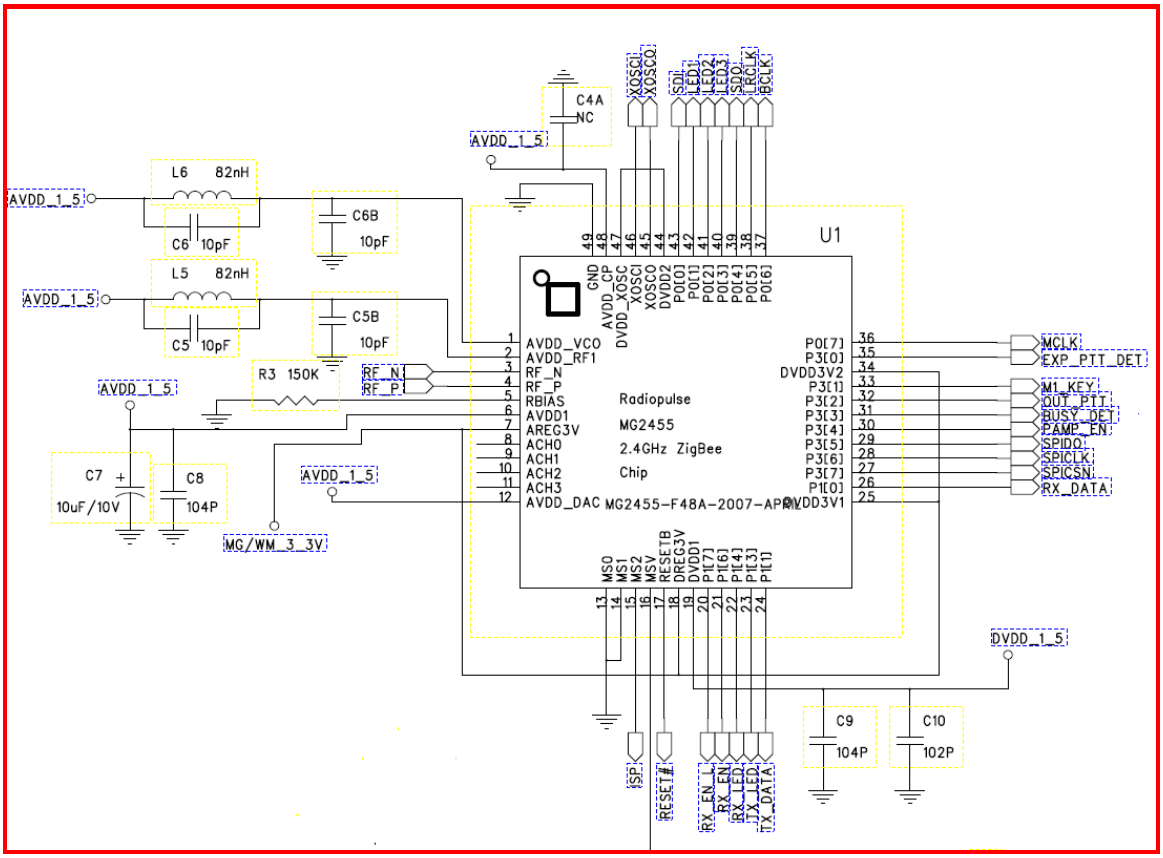
Audio Amp


DC+9V
R_AUDIO1
C92
104P
C93
10uF/10V
R30
100
C84
R79
5K6
TL074C
U10-A
MIC_INPUT
10u/10V
REF
R78
22K
R31
100
C70
10uF/10V
R80
3K3
REF
R81
22K
DC+9V
C83
150P
R19
1K
C63
102P
R32
47K
C62
100P
TL074C
U10-D
R62
47K
C55
103P
C71
47P
C72
1uF/10V
R65
NC
D11
FDLL4148
R60
22K
R61
47K
C86
1uF/10V
D10
1N5223
D9
1N5223
R65 NC NOMAL
ON VOX

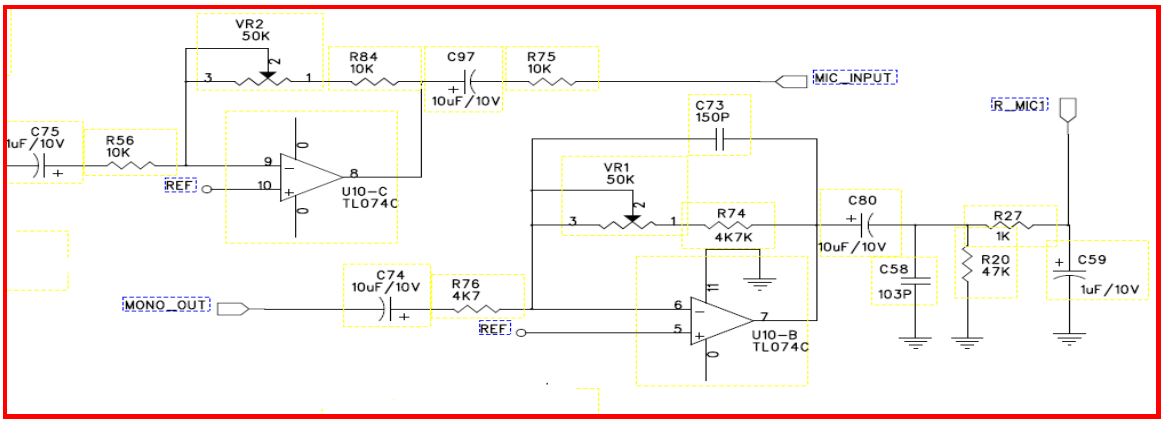
Code


C66
103P
C22
0.1uF/10V
C41 105P
C42 105P
MIC_INPUT
R17
680
C43
220pF
R16
47K
C44
4.7uF/10V
C45
10uF/10V
C46
105P
MG/WM_3_3V
C47
4.7uF/10V
C48
4.7uF/10V
C49
4.7uF/10V
MICN
MICP
MICBIAS
VMID
AUX
AVDD
AGND
SPKVDD
SPKGND
DCVDD
DBVDD
DGND
GND_BOTTOM
SPKOUTP
SPKOUTN
MONOOUT
MCLK
FRAME
ADCDAT
DACDAT
BCLK
MODE
CSB/GPIO
SCLK
SDIN
MONO_OUT
MCLK
LRCLK
SDI
SDO
BCLK
MG/WM_3_3
SPICSN
SPICLK
SPIDO
U5
WM8974/QFN24

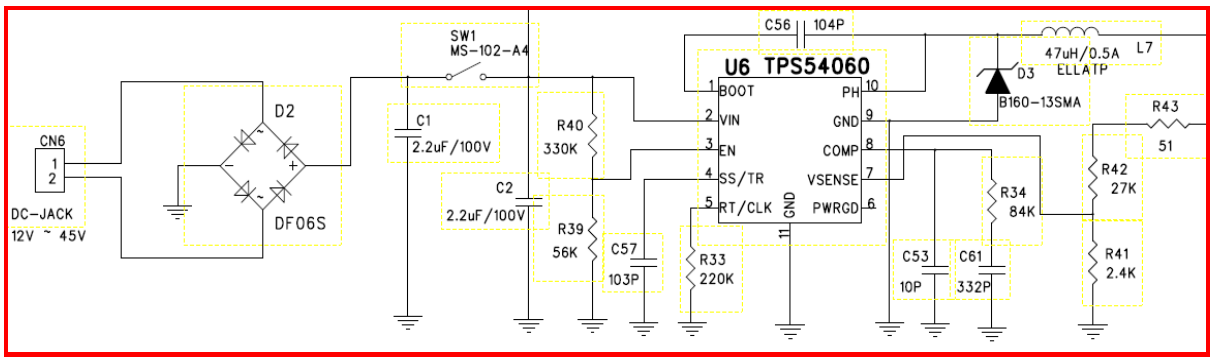
Main Chip



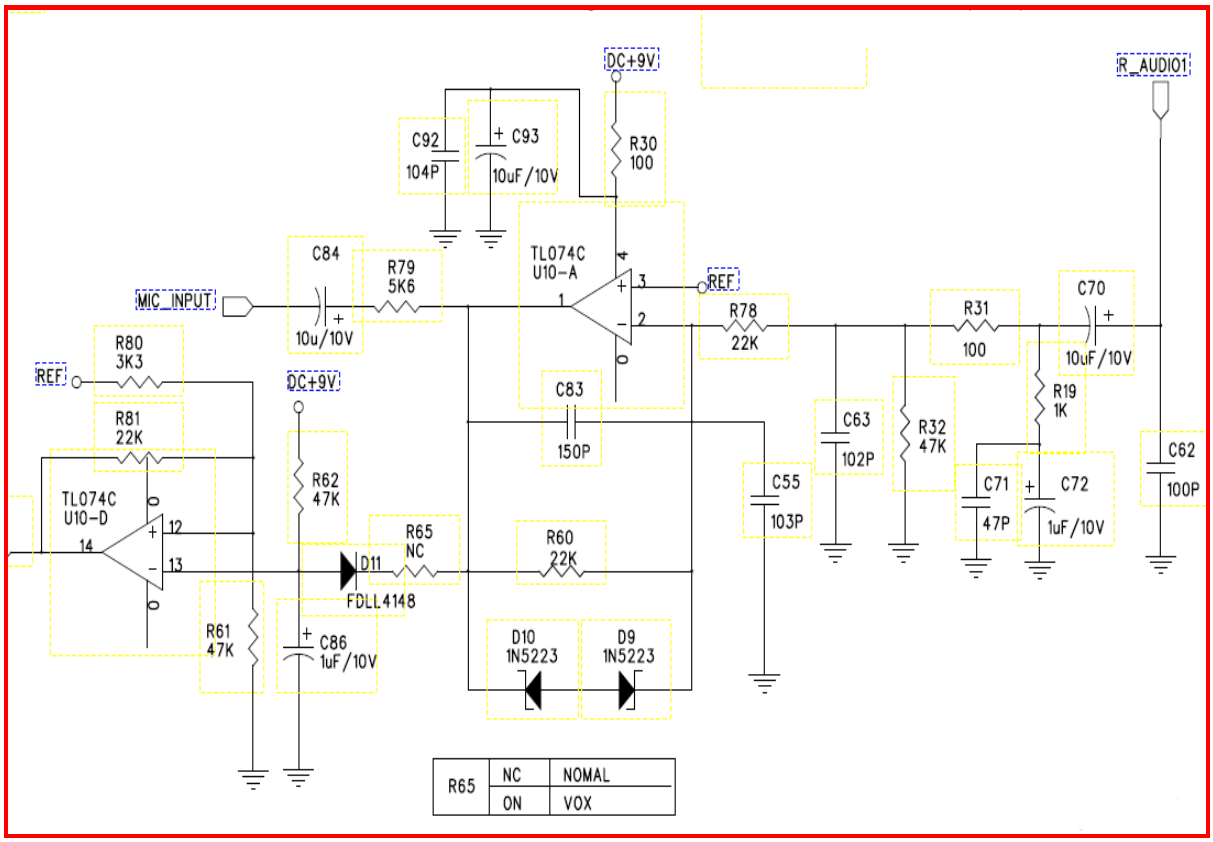
MIC Amp



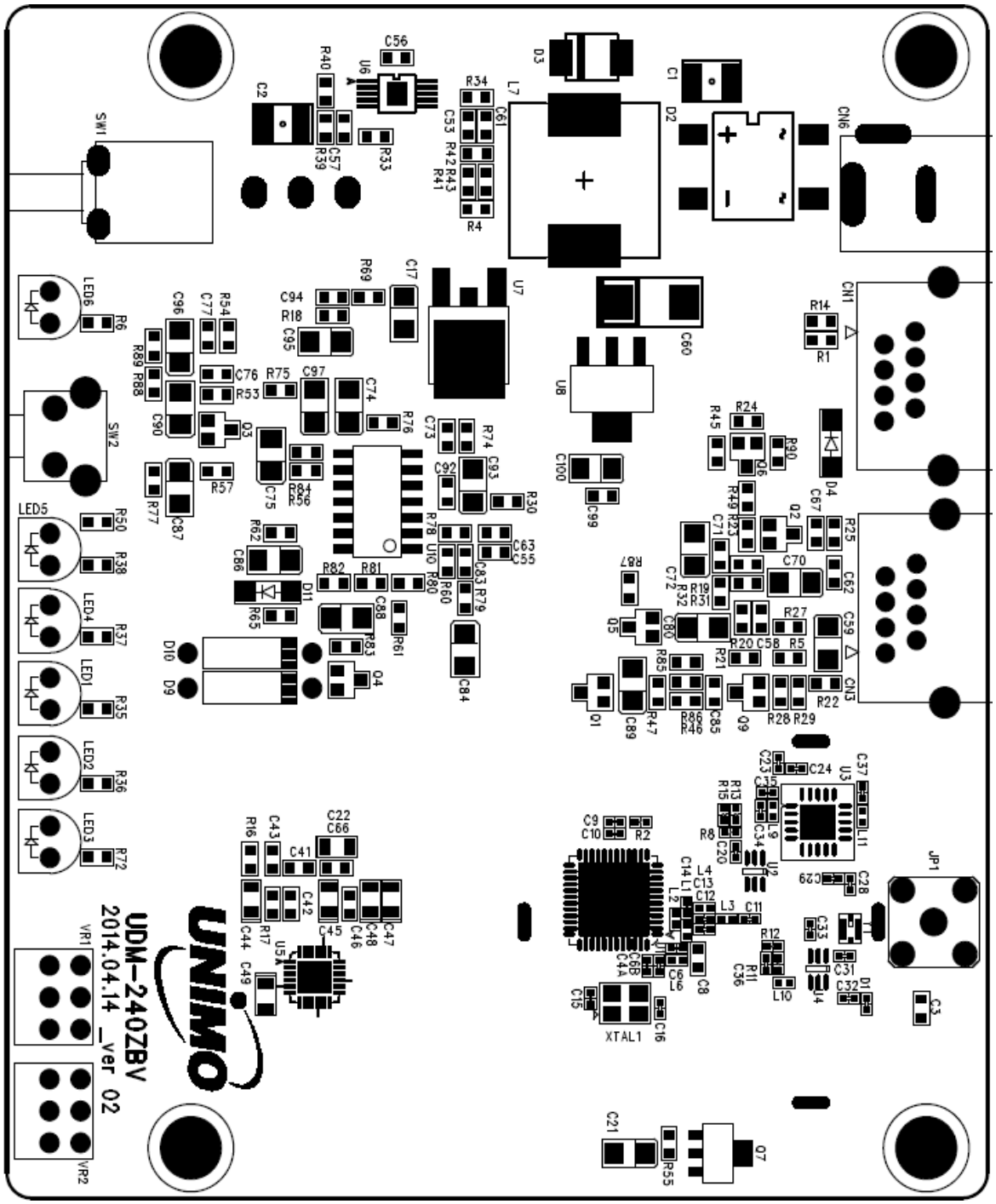
Power Supply



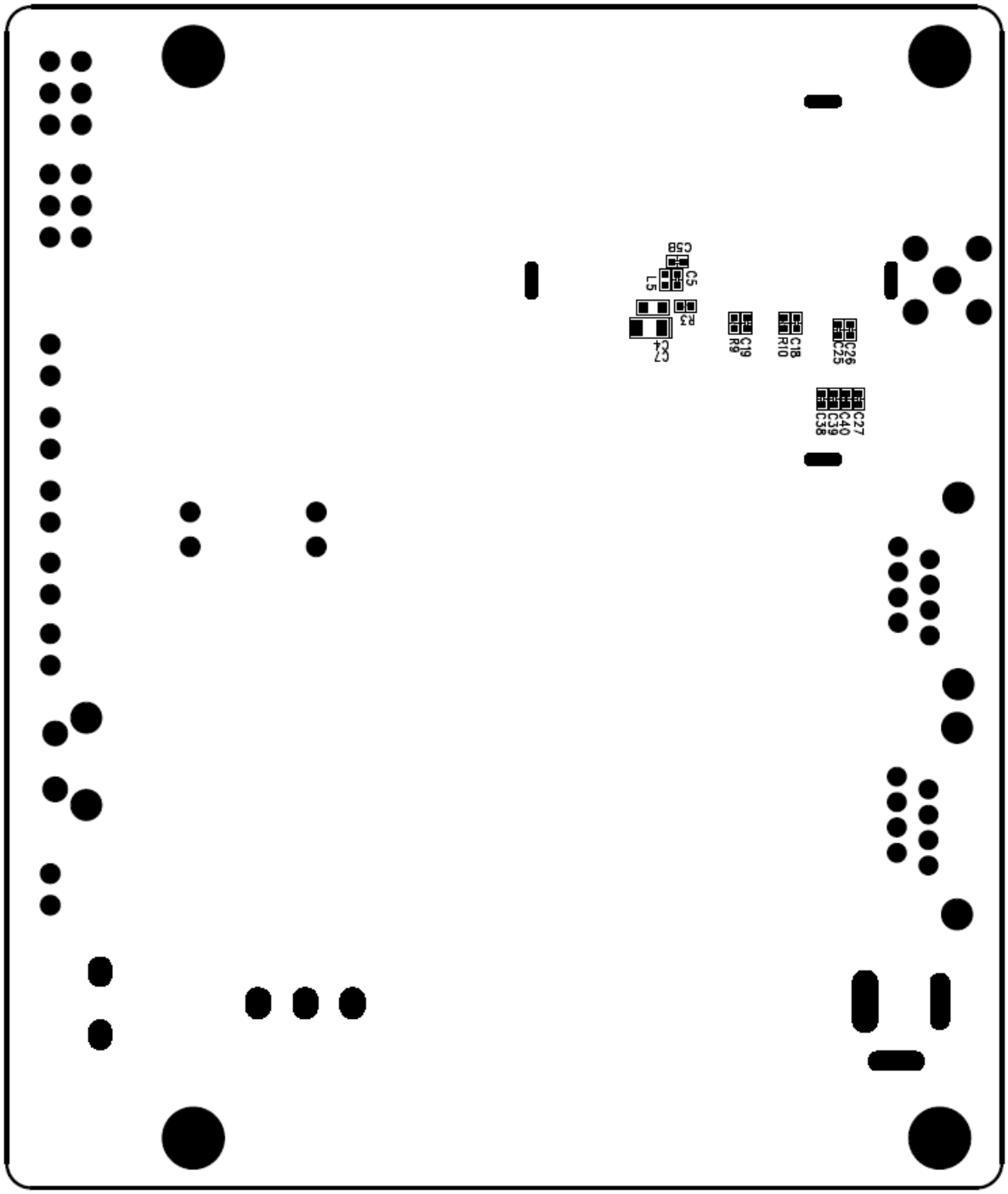
Audio AMP



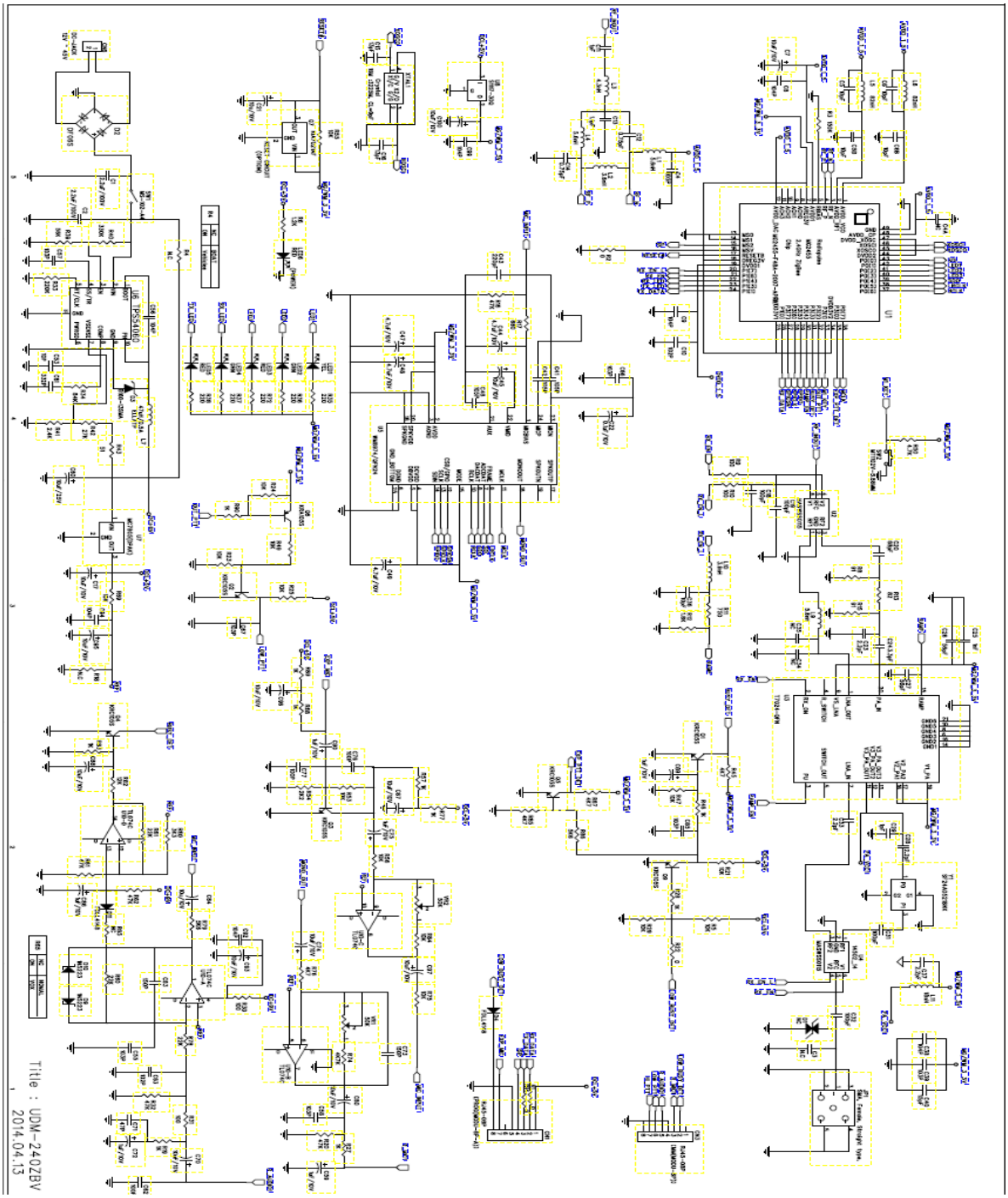
Parts Layout (top)



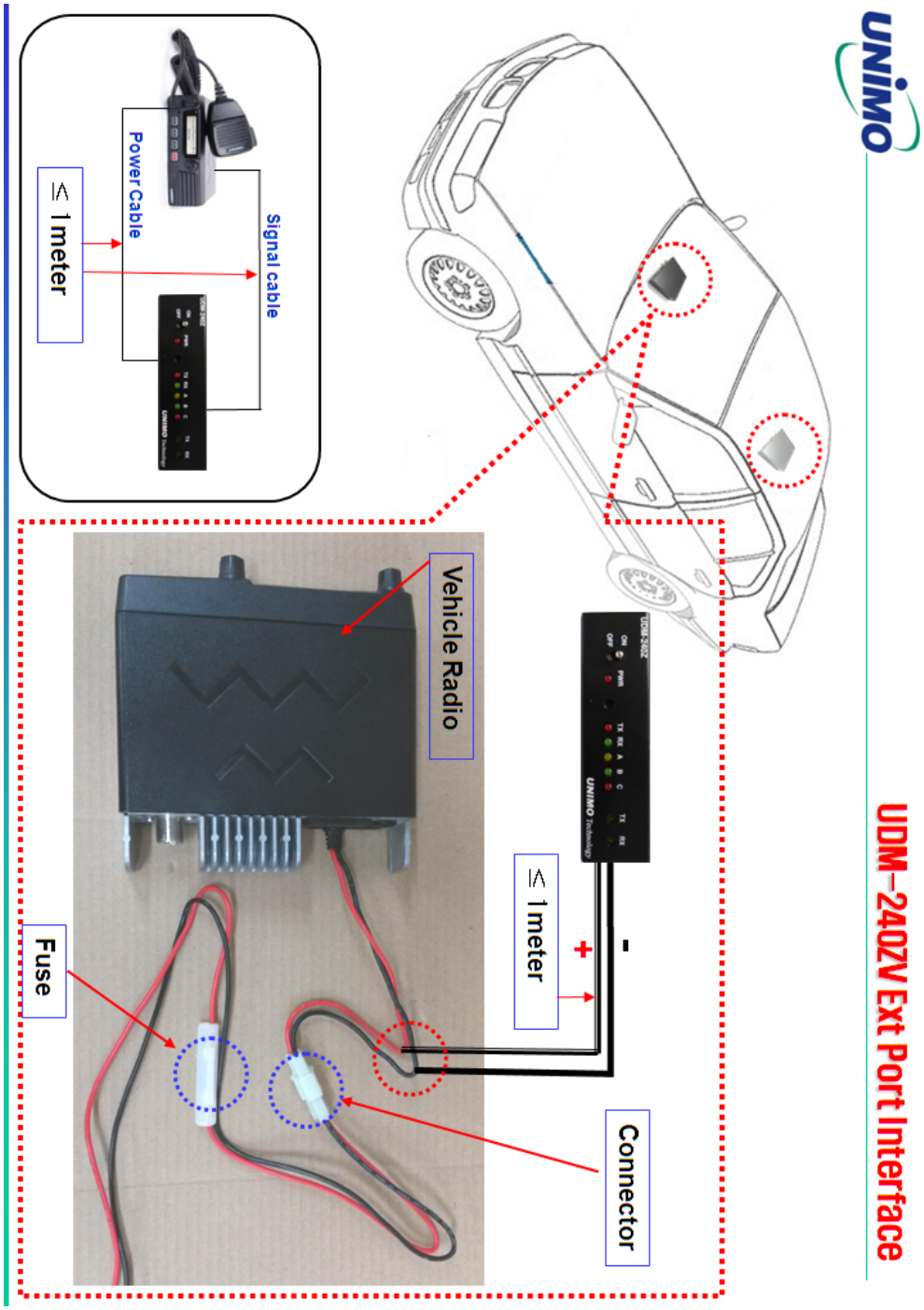
Parts Layout (bottom)



7 CIRCUIT DIAGRAM

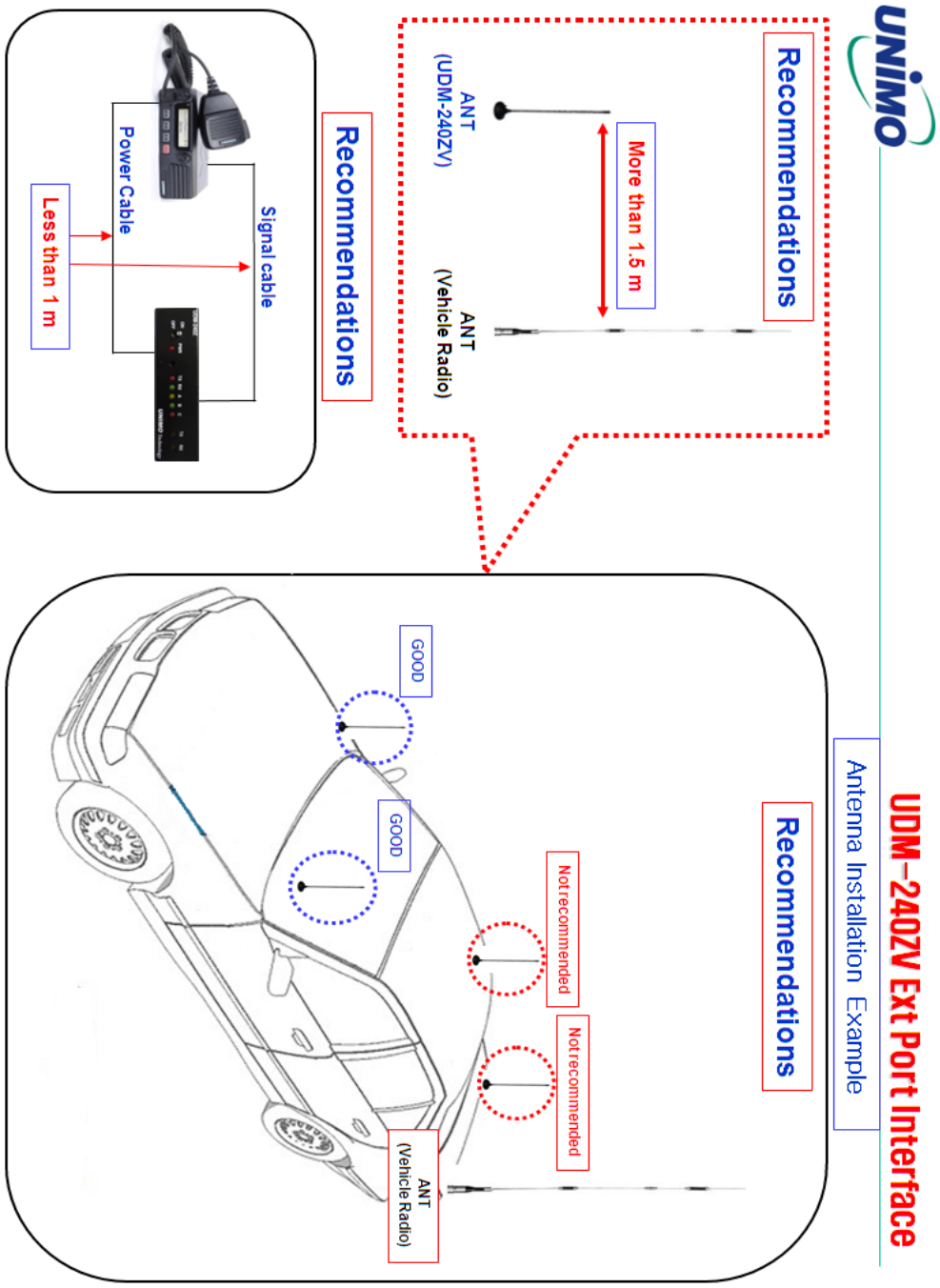


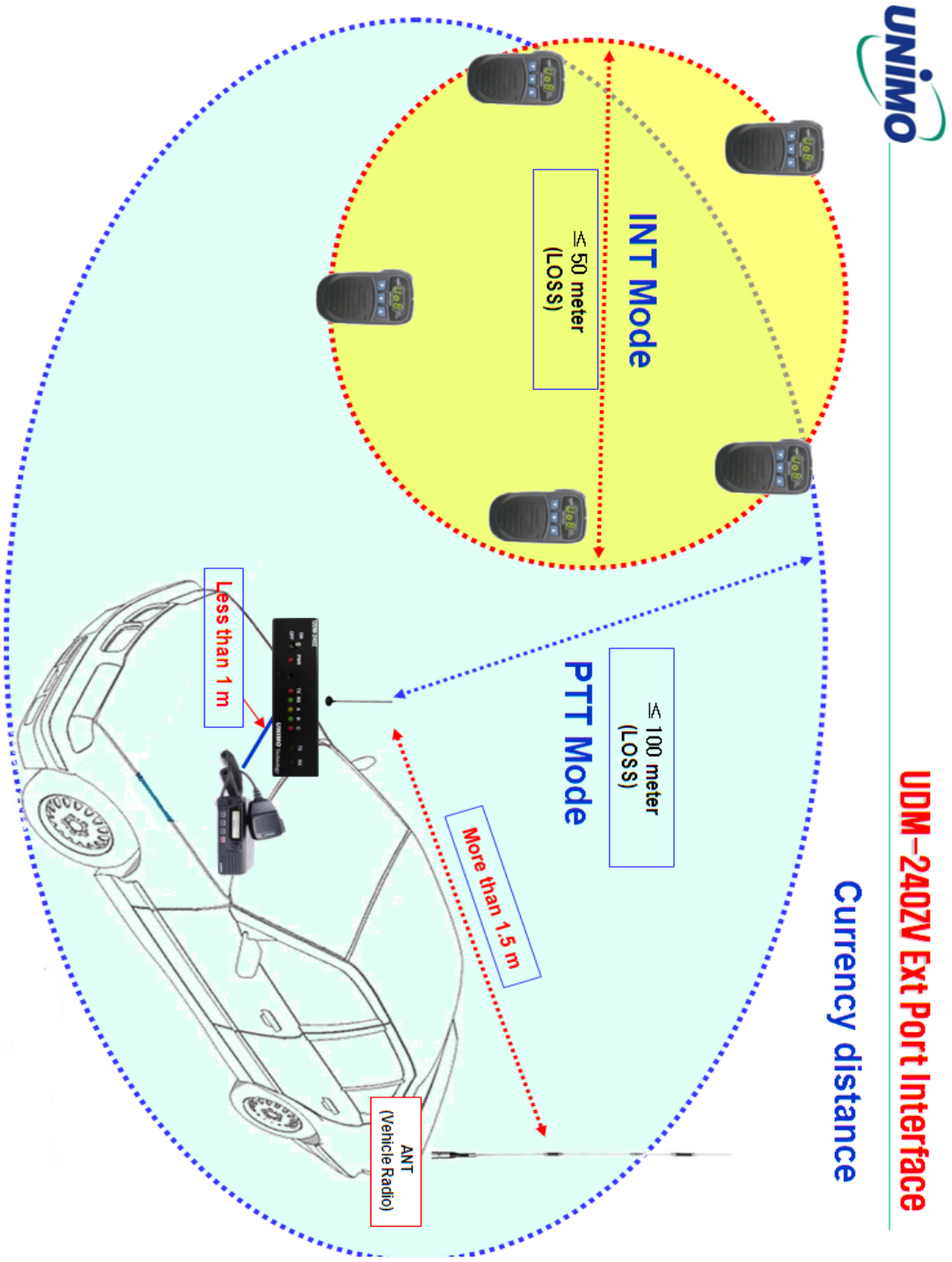
8 INSTALLATION



UDM-240ZV/ZBV

9 CONSIDERATIONS FOR INSTALLING




UNIMO
UDM-240ZV Ext Port Interface
Currency distance
INT Mode
≦ 50 meter
(LOSS)
PTT Mode
≦ 100 meter
(LOSS)
Less than 1 m
More than 1.5 m
ANT
(Vehicle Radio)

FCC Information to User

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 con-nected.

• Consult the dealer or an experienced radio/TV technician for help.

Caution

Modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

FCC Compliance Information : 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

IMPORTANT NOTE:

FCC RF Radiation Exposure Statement:

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.