

WEIVER 2.0 Player - RF Playback System / Manual

WEIVER 2.0 Player MANUAL





manual



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### **Environmental Issues**

Thank you for buying a product which contributes to a reduction in pollution and thereby helps save the environment. Our products reduce the need for travel and transport and thereby reduce pollution. Our products have either no or few consumable parts (chemicals, toner, gas, paper). Our products are low energy consuming products.

### Waste handling:

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### **Production of products:**

Our factories employ the most efficient environmental methods for reducing waste and pollution by ensuring that the products are recyclable.

# **OPERATOR SAFETY SUMMARY**

For your protection, please read these safety instructions completely before operating the equipment and keep this manual for future reference. The information in this summary is intended for operators. Carefully observe all warnings, precautions and instructions both on the apparatus and in the operating instructions.

# **Equipment Markings**

The lighting flash symbol within an equilateral triangle is intended to alert the user to the presence of un insulated "dangerous voltages" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electrical shock. The exclamation mark within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions within literature accompanying the equipment.

### Warnings

# Water and Moisture :

Do not operate the equipment under or near water - for example near a bathtub, kitchen sink, or laundry tub, in a wet basement, near a swimming poor or in areas with high humidity. Cleaning - Unplug the apparatus from the wall outlet before cleaning or polishing. Do not use liquid cleaners or aerosol cleaners. Use a lint-free cloth lightly moistened with water for cleaning the exterior of the apparatus.

# Ventilation :

Do not block any of the ventilation openings of the apparatus. Install in accordance with the installation instructions. Never cover the slots and openings with a cloth or other material. Never install the apparatus near heat sources such as radiator, heat registers, stoves, or other apparatus (including amplifiers) that produce heat. Grounding or Polarization - Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plus has two blades and a third grounding prong.

The wide blade or third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician. Power-Cord Protection - Route the power cord so as to avoid it being walked on or pinched by items placed upon or against it, paying particular attention to the plugs, receptacles, at the point where the cord exits form the apparatus.

### Attachments :

Only use attachments as recommended by the manufacture.

### Accessories :

Use only with a cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tipover.

### Lighting :

Unplug this apparatus during lightning storms or when unused for long periods of time.

### ISDN cables :

CAUTION - to reduce the risk of fire, use only No. 26 AWG or larger telecommunication line cord.

# Servicing :

Do not attempt to service the apparatus yourself as opening or removing covers may expose you to dangerous voltages or other hazards, and will void the warranty. Refer all servicing to qualified service personnel.

### Damaged Equipment :

Unplug the apparatus from the outlet and refer servicing to qualified personnel under the following conditions - When the power cord or plug is damaged or frayed If liquid has been spilled or objects have fallen into the apparatus If the apparatus has been exposed to rain or moisture If the apparatus has been subjected to excessive shock by being dropped, or the cabinet has been damaged If the apparatus fails to operate in accordance with the operating instruction

# **Warranty Period**

Lumantek Test & Measurement and Broadcasting products normally carry a 1-year limited warranty (including labor and parts) Unless noted, Lumantek Digital Media products normally carry a 1-year limited warranty (including labor and parts).

### **Return Material Authorization Policy**

No product may be returned directly to Lumantek without first contacting Lumantek for a Return Material Authorization ("RMA") Code. If it is determined that the product is defective, you will be given an RMA Code and instructions for product return for servicing or replacement. An unauthorized return such as where an RMA Code has not been issued, the product will be returned to you at your expense. Authorized returns are to be shipped prepaid and insured to the address on the RMA in an approved shipping container (original box and packaging materials or similar). To request an RMA Code, please visit on http://www.lumantek.com/ support/rma\_services\_instruction.html

### **Warranty Limitations**

Lumantek's limited warranty provides that, subject to the following limitations, each product will be free from defects in material and workmanship and will conform to Lumantek's specification for the particular product.

### **Limitation of Remedies**

Your exclusive remedy for any defective product is limited to the repair or replacement of the defective product.

Lumantek may elect which remedy or combination of remedies to provide in its sole discretion. Lumantek shall have a reasonable time after determining that a defective product exists to repair or replace a defective product. Lumantek's replacement product under its limited warranty will be manufactured from new and serviceable used parts. Lumantek's warranty applies to repaired or replaced products for the balance of the applicable period of the original warranty or ninety days from the date of shipment of a repaired or replaced product, whichever is longer.

# **Limitation of Damages**

Lumantek's entire liability for any defective product shall in no event exceed the purchase price for the defective product. This limitation applies even if Lumantek cannot or does not repair or replace any defective product and your exclusive remedy fails of its essential purpose.

### No Consequential or Other Damages

Notwithstanding anything else in this policy or otherwise, Lumantek will not be liable with respect to the products under any contract, negligence, strict liability or other legal or equitable theory (i) for any amount in excess of the purchase price for the defective product or (ii) for any general, consequential, punitive, incidental or special damages. These include loss of recorded data, interruption of use, the cost of recovery of lost data, lost profits and the cost of the installation or removal of any products, the installation of replacement products, and any inspection, testing, or redesign caused by any defect or by the repair or replacement of products arising from a defect in any product. This section does not limit liability for bodily injury of a person.

# Your Use of the Product

Lumantek will have no liability for any product returned if Lumantek determines that: The product was stolen from Lumantek.

The asserted defect:

- Is not present,

- Cannot reasonably be fixed because of damage occurring when the product is in the possession of someone other than Lumantek, or

- Is attributable to misuse, improper installation, alteration (including removing or obliterating labels and opening or removing external covers (unless authorized to do so by Lumantek), accident or mishandling while in the possession of someone other than Lumantek. The product was not sold to you as new.

The product was not used in accordance with Lumantek specifications and instructions.

The product was not used for its intended function.

# **Additional Limitations on Warranty**

Lumantek's warranty does not cover products which have been received improperly packaged, altered, or physically damaged.







# 1. INTRODUCTION

# 1.1 / WEIVER 2.0 Player System

WEIVER 2.0 Player plays back the real world RF signals which had either recorded with WEIEVR - RF capture and playback platform or other RF capture equipments. Also, it comes with a converting utility that converts the I/Q data file into a possible data format, .wpj, with WEIVER 2.0 Player. It's all for to re-generate real world RF environments that are too complex To exact simulate.

It records signals directly to external SSD, and plays back directly from external SSD, so you can carry the "hassle-free heavy RF data copy" on your own.

# FEATURES

- · Supports all universal DTV and ATV broadcasting include Broadcasting Radio protocols
- Playback of real world broadcasting signals recorded with WEIEVR R & P platform to regenerate real world conditions that are too complex to simulate
- Front-access hot swappable SSD for fast reading and writing speed
- e-SATA interface for external storages
- Support for Real-time Spectrum and GPS location with Signal Tracer

WEIVER-RF capture and playback system can plays back RF signals covering the bandwidth range from 8M to 56M, or ARB in almost any environment, such as in laboratories or during on-site testings. You can see the all information about WEIVER-RF capture and playback equipment from LUMANTEK's web site (http://www.lumantek.com/prod/prod\_detail.html?prod\_num=A0001).





# 1.2 / User System Requirements

Your PC(System) must meet the following specification.

- Computer / Processor
  - Intel Pentium 4 2.33GHz
  - Athlon 64 2800 or the faster processor
- Operating System
  - Windows XP 32 bit service pack(sp2)
  - Windows Vista 32 bit service pack(sp2)
  - Windows Vista 64 bit service pack(sp2)
  - Windows 7 32bit
  - Windows 7 64bit
- Memory
  - 2GB RAM

Hard Disk Space

-1TB GB SSD available hard disk space

- Screen
  - 1024x768, "32-bit True Color"
  - DirectX 9.0c or higher
- Graphics Card

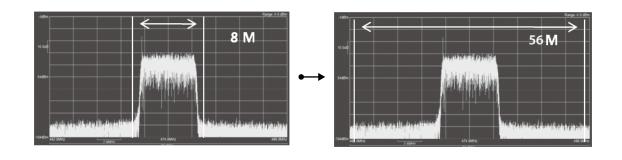
DirectX 9.0c supported

- Network
  - -10/100 Mbps network card, 10/100/1000Mbps network card(Recommend)
  - 802.11 b/g Wireless network card

# 1.3 / Optional Upgrade

# • Bandwidth

- 8M,24M,48M,56M Band Width : User can play up to Wide 56M Band Width.



# External SSD Hard disk (Optional)

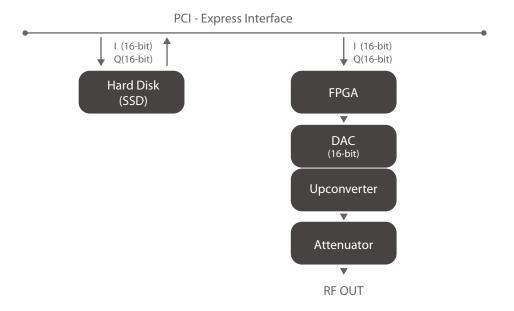
- Size : 1 TB

- TRIM : Yes

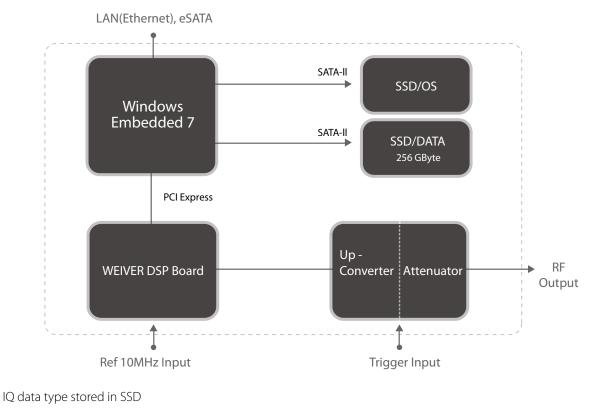
- Read Speed : 250 MB / Sec(Max.)



# 1.4 / Data Flow



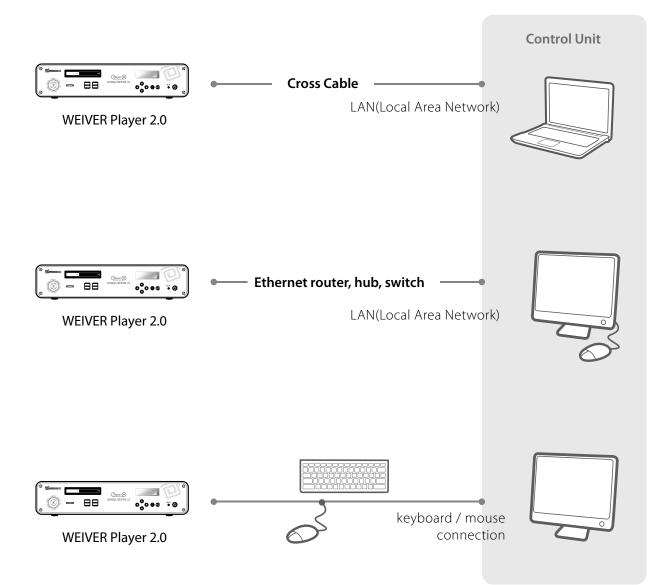
# 1.5 / Schematic Diagram



- I : signed 16-bit integers
- Q : signed 16-bit integers 10, Q0, 11, Q1, ..., In, Qn



# 1.6 / Control Configuration (Recommended)





# 1.7 / System Specification

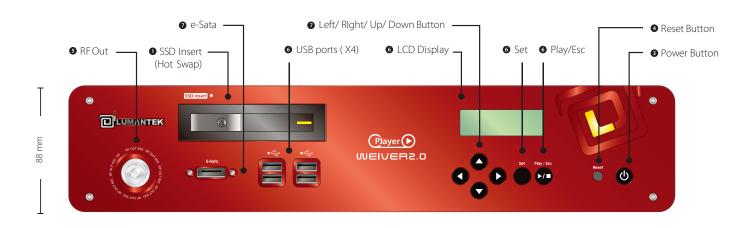
T 88 mm L	O Durate access o	478 r	wyer Control C	
Frequency			RF Output	
Frequency band Real time bandwidth	56MH variat	2700 MHz Iz max. (Arbitrary ble BW, 1Hz step)	RF output port Max. DC input Max. reverse RF power	50ohm, N type female, DC-cp ±25 VDC max. 1 W (Max.)
Frequency resolution Warm-up time Freq. Stability vs. Temp. Daily Aging	±20 p	nin. nutes (typ.) pb max. ıb max.	Environment	
Aging (PER year)	±50 p	pb max.	Operating temperature Relative humidity Storage temperature	0 to +50 ℃ 90% -20 to +70 ℃
Phase Noise@1 KHz offse	≤ -95	0 dBc/Hz (30 MHz) dBc/Hz (1 GHz) dBc/Hz (2.7 GHz)	Power	
Phase Noise@10 KHz off:	≤ -10	5 dBc/Hz (30 MHz) ) dBc/Hz (1 GHz) dBc/Hz (2.7 GHz)	Input power Lowest Power Consumptior	100-240V ~ 3-1.5A, 50-60H ז 70 Wat
Spurious Responses		≤ -50dBc	Mechanical	
3rd Harmonic other		≤ -60dBc ≤ -60dBc	Dimensions (W)478m	nm x (H)88mm x (D)462mm
RF Output Characteristic	S		Weight 5.5 kg (A	pprox.)
Gain range Amplitude resolution Amplitude accuracy Power	0.1dB step ±1dB +3 dBm m	dB (Input Level Basis) (Min.) ax.(48 to 2700 MHz) max.(0.1 to 48 MHz)		

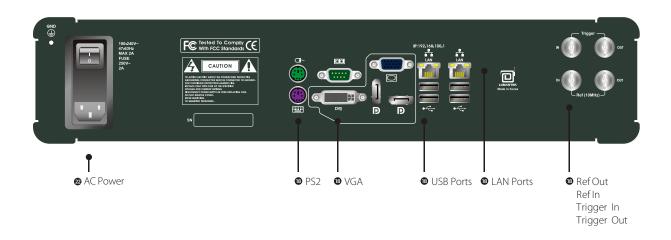


# 2. SYSTEM DESCRIPTION

# 2.1 / WEIVER 2.0 Player Components

• External Component Feature Description





450 mm



# 2.2 / WEIVER 2.0 Player System Configuration

Basic Component



WEIVER 2.0 Player Body





Weiver\_EX Program WEIVER 2.0 Player Operation Manual WEIVER 2.0 Player Test Report WEIVER 2.0 Player Restore Data



Optional Component



# 2.3 / Installation precautions

This section describes safety precautions that users shall be aware of during the system installation and operation. Not complying such precautions may result in serious harm or personal injuries. . For that reason, please keep all details here in mind before installing or using the WEIVER 2.0 Player. <u>Please carefully read the followings for safe use of Weiver 2.0 Player</u>

# General Precautions

- Must be operated and maintained free of dust or dirt.
- The cover should be securely fastened.
- Securely stow all the cables, external antennas, external SSD or any other tools away in a safe place after its use.
- Avoid wearing loose, draping clothing, and dangling jewelry when using WEIVER 2.0 Player.

- Do not open the WEIVER 2.0 Player case. Doing so may void the warranty and LUMANTEK takes no responsibility for the damages caused by such action. Should you be experiencing performance issues, please contact your local dealer for assistance.

# Power Precautions

- Make sure if it may cause overload in wiring when you connect the power source.
- Avoid wearing necklaces or watches when connecting the system to power source. These may cause electronic shocks to the system.

- Avoid operating on a wet floor out in the open (e.g., raining). Make sure the power extension cable is in satisfactory condition (e.g., not worn out).



- Disconnect the system from power source before hardware installation, rub or contact on the metal surface of the system to discharge statics from your body.

- Note: Manufacturer is not responsible for damages caused by using or replacing inappropriate components or not authorized services.

- Supplying power during installation may cause serious damages to the system and personal injuries.

# AC Power

- This unit comes with the AC power cord, grounding connection is necessary.
- In the event of a fire, please disconnect the system from power source.

# Log-off Caution



Do NOT log off while "Remote Desktop "is running. You must shut-down the program by pressing the close[x] button on top right. If you log-off the player, running program will be stopped and "Please Wait"sigh will be appeared on front panel. To recover from this state, you must log-on again after connecting the keyboard & monitor.



# 3. CONTROL

# 3.1 / Starting WEIVER 2.0 Player

The "Weiver\_Ex" program is for connecting and controlling the Weiver 2.0 player system. You will see a "remote" sign displayed on front LCD panel when the system is being connected.

State				
S/N:WEEJ07079	Mode:Play	Drive:D	Ref:INT	
Connect:Off	License:P8P24	Total:238 GB	Trigger:Off	
GPS:Off	FPGA_Ver:1.3.0.1	Free:131 GB		
Play				
File Name:SPUR_8M_ Frequency:40000000				
Gain:0 X 0.1dB				
BW:8MHz				
Spectral Inv:Off				
<< Weiver Status>>				
Update Time : 100				_
> Spectral INV:OFF				
>				
extclk:Ext Clk Disable				
12				
<< Weiver CMD >>				
modechange 0				
playfile D:\Ref_Weiver\S playspeciny 0	PUR_8M90dBm.wpj			
extclk 0				
<< CMD >>				
		LCD Control Re-	-Start OK C	ance

# 3.2 / Front Panel Operation

# [Play]

Set --> 1. Play File --> Set
 1. Play File
 2. Frequency
 3. Gain
 4. Spectrum Inv.

# --> File Select

Play File → D:\	Play File \ → REF_24M_0dBm.wpj REF_8M_0dBm.wpj
> ● Set	> ● Play
Local Ref Int T. <b>474</b> 000 MHz + 0 dBm REF_24M_0dBm.wpj	Local Ref Int Y.II <b>474</b> 000 MHz + 0 dBm REF_24M_0dBm.wpj



# [Frequency Change]

● Set --> 2. Frequency --> ● Set 1. Play File → 2. Frequency 3. Gain 4. Spectrum Inv.

- --> Change (up / down / left / right)
- --> Change (up / down / left / right)



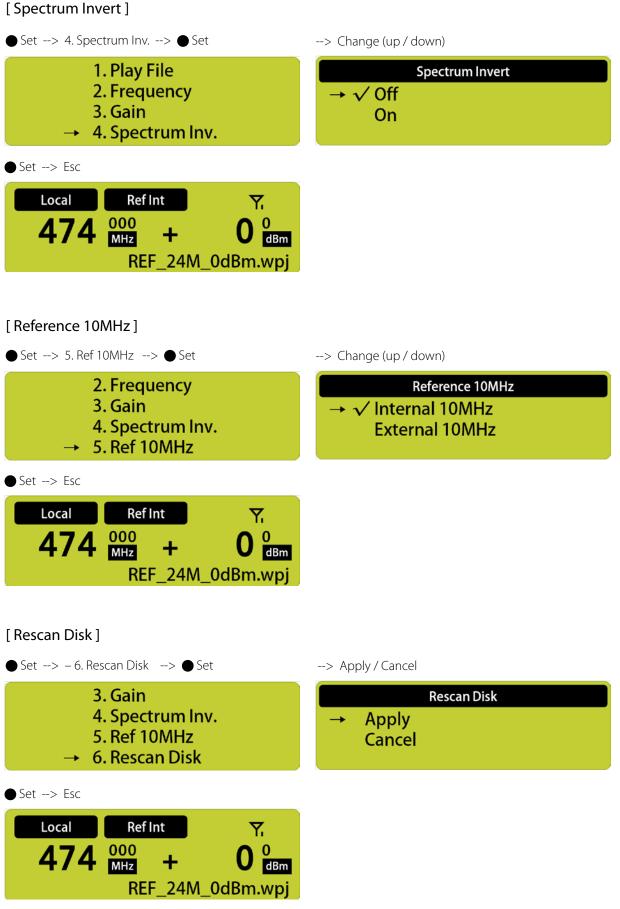
● Set --> Esc



# [Gain Change] $\bullet$ Set --> 3. Gain --> $\bullet$ Set--> Change (up / down / left / right)1. Play File<br/>2. Frequency<br/> $\rightarrow$ 3. Gain<br/>4. Spectrum Inv.Gain<br/>+00.0 dB<br/>[+30 ~ -30dB/0.1dB]

● Set --> Esc





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# [IP Setting]

● Set> 7. IP Setting> ● Set	> DHCP
4. Spectrum Inv.	IP Setting
5. Ref 10MHz	→ DHCP/Static
6. Rescan Disk	IP Address
→ 7. IP Setting	Subnet Mask

# Change (up)

--> Static

5 (1)	
DHCP/Static	IP Setting
$\rightarrow \sqrt{DHCP}$	→ DHCP/Static
STATIC	IP Address
	Subnet Mask

# Change (down)

--> IP Address

--> Subnet Mask

--> Gateway

--> Apply / Cancel

IP Setting

DHCP/Static	IP Setting
→ DHCP	DHCP/Static
√ STATIC	→ IP Address
	Subnet Mask

# --> Address Setting

**IP Address** IP Setting DHCP/Static 000.000.000.000 **IP Address** Subnet Mask

# --> Subnet Mask Setting

Subnet Mask	IP Setting
000.000.000	IP Address Subnet Mask → Def. Gateway

--> Gateway Setting



# [Version]

● Set> 8. Version> ● Set	Change ( up/down )
5. Ref 10MHz 6. Rescan Disk 7. IP Setting → 8. Version	Version           S/N : WEE000000           → S/W Ver : 2.1.1.8           FPGA Ver : 1.3.0.1
Set> Esc	
Local RefInt $\Upsilon$ 474 $\frac{000}{MHz}$ + 0 $\frac{0}{dBm}$	
KEF 24W UDBM.WDI	
REF_24M_0dBm.wpj	
[ System Default ]	
	> Apply/Cancel
[ System Default ]	> Apply / Cancel System Default → Apply Cancel
[ System Default ] ● Set> 9.System Def> ● Set 6. Rescan Disk 7. IP Setting 8. Version	System Default → Apply



# 4. SYSTEM OPERATION

# 4.1 / WEIVER 2.0 Player Operation

Connect the WEIVER 2.0 Player to a laptop or desktop PC with both Microsoft Windows OS and the 'Weiver\_EX' program installed. In case where system update is necessary, please have a monitor, keyboard and mouse ready. You may also use remote access control.

# 4.2 / Weiver\_EX Software Installation

Please visit LUMANTEK online Download Center at http://www.lumantek.com/support/download. html to download 'Weiver\_EX' program. Doubleclick on the program icon will initiate the installation.

# InstallShield Wizard



Preparing the InstallShield® Wizard which will guide you through the rest of the setup process. Please wait...





💐 WeiverEx - InstallShield Wizard 📃 🗆 🔀	🐸 WeiverEx - InstallShield Wizard
Ready to Install the Program The wizard is ready to begin installation.	Setup Status
Click Install to begin the installation.	WeiverEx Setup is performing the requested operations.
If you want to review or change any of your installation settings, click Back. Click Cancel to exit the wizard.	
	Installing WeiverEx.exe
InstallShield	InstallShield
< <u>B</u> ack Install Cancel	Cancel

The 'Weiver\_EX' program installation status will be show as pictures below with a progress bar.

Click 'Install' to begin installation.

The 'Weiver\_EX' installation is now completed; click 'Finish' to exit the program.

🍓 WeiverEx - InstallShi	ield Wizard
	InstallShield Wizard Complete The InstallShield Wizard has successfully installed WeiverEx. Click Finish to exit the wizard.
	< Back Finish Cancel

# 4.3 / Weiver\_EX Software Update



Please visit us at http://www.lumantek. com/support/download.html to download 'Weiver\_EX' program. Once downloaded, double-click to upgrade and select 'Yes' to uninstall previous version of 'Weiver\_EX'.





Once uninstallation is finished, double-click on 'Weiver\_EX\_ Setup.exe' to install the program.

# InstallShield Wizard

Click 'Install' to begin installation.

4

Preparing the InstallShield  $\hfill Wizard$  which will guide you through the rest of the setup process. Please wait...

Click 'Next' to proceed with the 'Weiver\_EX' installation process.



WeiverEx - InstallShield Wizard

Ready to Install the Program

The wizard is ready to begin installation.

Click Install to begin the installation.

If you want to review or change any of your installation settings, click Back. Click Cancel to
exit the wizard.

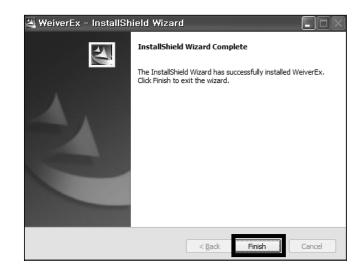
InstallShield

(Back Install Cancel

The 'Weiver\_EX' program is being installed as shown with the progress bar.

💐 WeiverEx - InstallShield Wizard	
Setup Status	
WeiverEx Setup is performing the requested operations.	
Installing WeiverEx.exe	
InstallShield	Cancel

The 'Weiver\_EX' installation is now completed. Click 'Finish' to exit the program.



2 1

# 4.4 / Ethernet Connection Method

- DHCP is default settings for the WEIVER 2.0 Player's LAN connection. The WEIVER 2.0 Player automatically receives the IP address from the Network immediately.

- Please access to the 'Internet Protocol (TCP/IP) Properties' menu in both PC and the player, make sure 'Obtain an IP address automatically' has been selected

# • Laptop and Desktop PC: TCP/IP Configuration

	utomatically if your network supports I to ask your network administrator for
) Obtain an IP address automat	ically
Use the following IP address:	
P address:	
Subnet mask:	
Default gateway:	
Obtain DNS server address a	utomatically
) Use the following DNS server	addresses:
Preferred DNS server:	
Alternate DNS server:	
	Advanced

# WEIVER 2.0 Player TCP/IP Configurations

rpet Protocol Version 4 (TCP/IPv4) Properties

Obtain an IP address aut	tomatically		
Use the following IP addr	ress:		
IP address:			
Subnet mask:			
Default gateway:			
• Obtain DNS server addre			
Preferred DNS server:	10 A.		

# 4.5 / Cross Cable Connection Method( use Gigabit LAN port : see page17-no. (1)

This section is to show cross cable connection between PC and the Player by using static IP address. Please note that the first three columns of the static IP address for both PC and the player must be identical. To control WEIVER 2.0 Player using fixed IP, move to the WEIVER 2.0 Player network setting menu and set IP address manually.

• WEIVER 2.0 Player Configuration

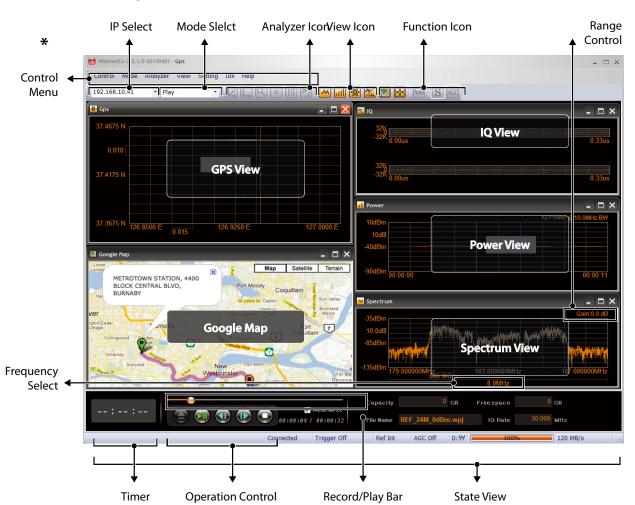
# • Laptop and Desktop PC Configuration

Internet Protocol (TCP/IP) Properties	Internet Protocol Version 4 (TCP/IPv4) Properties
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.	You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
<ul> <li>Obtain an IP address automatically</li> <li>Use the following IP address:         <ul> <li>IP address:</li> <li>Subnet mask:</li> <li>255.255.255.0</li> <li>Default gateway:</li> <li>192.168.100.254</li> </ul> </li> </ul>	C Obtain an IP address automatically C Use the following IP address: IP address: Subnet mask: Default gateway: IP2 . 168 . 100 . 1 IP2 . 168 . 100 . 254
O Dbtain DNS server address automatically O Use the following DNS server addresses: Preferred DNS server: Alternate DNS server:	Obtain DNS server address automatically     Ot use the following DNS server addresses:     Preferred DNS server:     Alternate DNS server:     Alternate DNS server:
Advanced	Validate settings upon exit     Advanced       OK     Cancel

Now, the Weiver\_EX program can be initiated to access and monitor the WEIVER 2.0 Player operations

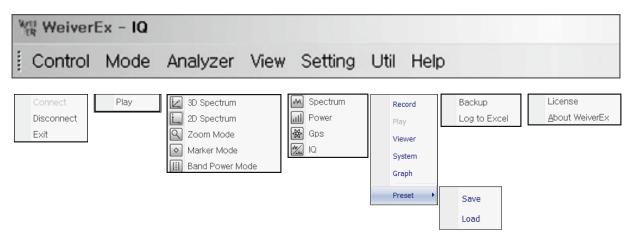
# 4.6 / Weiver\_EX Operation

To use the latest version of the 'Weiver\_EX program', please visit our S/W Download page at http://www.lumantek.com. You can find detailed features and functionalities of the 'Weiver\_EX' program.



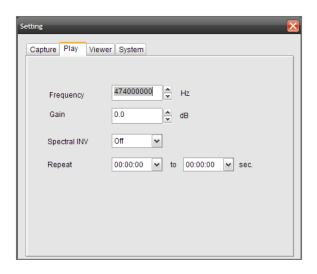
# Weiver\_EX Program(software)

★ The Weiver\_EX control menu and sub-menu is as shown below





# Setting



There are four unique tabs in 'Setting' menu.

The 'Play' tab includes Frequency, Gain, Spectrum INV and Repeat settings.

# - Frequency

Adjust the RF signal Center Frequency at user's choice.

### - Gain

Amplify or reduce the signal strength. (Input RF signal power of -30dB to +30dB). Zero (0dB) indicates that the power of the captured and playback signal are equal. The maximum output signal cannot exceed +10dBm.

# - Spectral INV

Inverting I/Q signal output function On / OFF

- Repeat

Repeated (loop) play function in specific time duration.

- Trigger \*

Activate the synchronization with the Signal Generator by external Trigger Signal.

Setting	×
Capture Play	/iewer System
ResBW	3KHz 🗸
Average	
Unit dB	dBm 💌
Marker	1
Spectrum Update	Fastest
Frequency Step	1MHz 🗸
otop	

# <u>The 'Viewer' tab includes ResBW, Average, Unit dB and Marker</u> <u>settings.</u>

- ResBW

Adjust the resolution of 'Spectrum Window'. [3 KHz, 5 KHz, 10 KHz, 20 KHz]



Capture	Play	Viewer	System	Graph			
				_			
Ref	(10MHz)	EXT		·			
	Trigger	On	•	·			
Tri	gger Out	Low	•	•			
St	torage						
۲	Internal	D:\				_	
$\odot$	Externa			Re	scan Disk		

### - Average

Enable/Disable 'Exponential' features in Spectrum Window.

### - Unit dB

The RF Power level indication unit can be changed into dBm, dBmV, dBuV individually at user's convenience.

### - Marker

Mark up to four (4) random individual points in spectrum window and display them simultaneously with power level indications.

# Spectrum Update

Change the spectrum window update interval in five different speeds. The Fastest, Faster, Normal, Slower, and the Slowest.

# - Frequency Step

From 1 to 100MHz, a user can change a frequency in every 10 MHz step. Change the frequency setting, shifting up/down will occur in spectrum window in accordance with the setting value.

### The 'System' tab includes Ref(10MHz), Trigger, and Storage settings.

# - Ref(10MHz)

Select the EXT external Clock for synchronizing with the PLL Clock by external clock signal input.

# \* Trigger Operation

In WEIVER\_Ex setting, user can choose to use an external trigger.

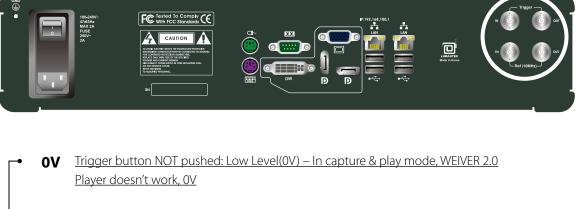
Setting	Setting
Capture Play Viewer System Graph	Capture Play Viewer System Graph
Ref(10MHz) EXT -	Ref(10MHz) EXT •
Trigger On -	Trigger Off
Trigger Out Low 🔻	Trigger Out Low •
Storage	Storage
Internal D:\     External      Rescan Disk	<ul> <li>Internal D∆</li> <li>External</li> <li>External</li> </ul>

Trigger On

Trigger Off



If the user is equipped with an external trigger and set the trigger on (in previous page),



3.3V Trigger button pushed: High Level(3.3V) – In capture & play mode, WEIVER 2.0
 Player starts to work, 3.3V

# Play Mode Scenario with trigger

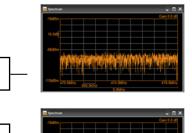
- 1. Insert a trigger in 'trigger port': Low Level(0V)
- 2. Trigger's power On

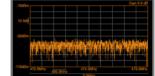
3. In WEIVER\_Ex, select the file and click on Play (start) Button

- 4. Activate (push) the Trigger: High Level(3.3V)
- 5. Playing file(iqw, wpj)

Playing... Playing

6. Deactivate(push again) the Trigger : Low Level(0V)7. In WEIVER\_Ex, Click on the stop button





Stopping

Updating

Updating-> Stopping

8. Trigger power OFF



### 🚧 Spectrum \_ 🗆 🔀 M Spectrum -27dBi M0: 473.000MHz -16.9dBm 10.0dE -77dB Peak Search -50dBr Marker 1 Marker 2 Marker 3 Marker 4 2 4 M La alta di 🚧 Spectrum M Spectrum \_ 🗆 🔀 ie:0.0 d -27dBr 10.0d -77dB الالاللأعار استريديا أشريها Kalia a Ala, UAL DI A AL IA -127dBm 2.4MH M Spectrum -27dE -77dB

# • Analyzer

### - 3D Spectrum

Spectrum window can be displayed in 3D view.

# - 2D Spectrum

The default setting is in 2D style. The Complex FFT Spectrum will display captured 8M bandwidth and captured 24M bandwidth.



	M
bde	

Zoom on the area by clicking first on the left mouse button and dragging to the preferred point and then clicking on the left mouse button. The area the user has selected will be highlighted. If you want to zoom back to the previous screen, or to the original state, click on or simultaneously press Ctrl and Z.

# - Marker Mode

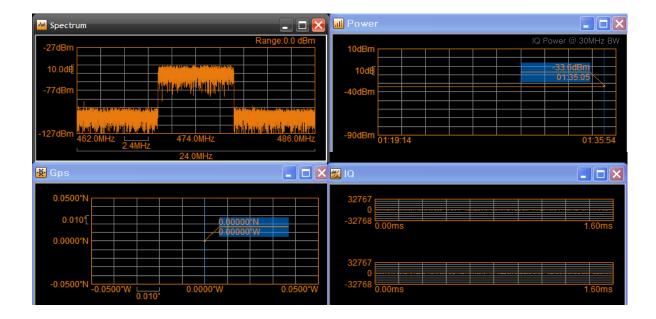
The Marker feature indicates the power level of RF signal.

### - Band Power Mode

In the Spectrum View, drag your mouse to the desired Band Power Range to see the respective measurement.



### View



# - Spectrum

By adjusting the frequency in spectrum window, user can observe in-band RF signal (within range from 8M to 56M bandwidth). By adjusting the Range Input Capture mode, the RF IN signal power can be optimized by controlling the range in a capture mode.

# - Power

The power level of RF IN signals from the Antenna or RF Cable can be observed.

# - GPS

In the Preview Mode, the current GPS coordinates is displayed. In the Capture Mode, the actual GPS coordinates of the captured data is shown and recorded.

# - IQ

The RF input signal I (In-Phase) / Q (Quad-Phase) signal is displayed separately.



# 4.7 / Weiver Utilities

🗖 Play Folder Li	ist			
		File Nam	e	File S
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System Volur	ne Informatio	on 🗌 live_dr	nb_24M.bin	
WeiverData	0	new bi	n	
Record	Сору			
WeiverDataR			ATSC.b	bin
x86				
E:\				
	0/1		1	/1
	E:\ 🗸	Сору	Cancel	
<	][:	>		
Update	Play	Delete	Сору	Т

# • Backup

Default storage for captured data is in D: \ (D Drive). When default internal storage reaches to the point where remaining storage capacity is 2GB or less, it automatically stops. To ensure continuous uninterrupted data capture, a backup external storage device (e-SATA SSD) must be enabled/connected.

# Log to Excel

Provides the functions of extracting information such as File Names, File Sizes, BW, Sample Clock, Frequency, Time, Time Based Signal power, Time Based GPS Location, and saving them in form of excel files.

All raw data gained during field testing can be harvested for documentation and reporting.

[.xls format]

			1
	Util	Help	2
	Oui	Пер	3
		Backup	4
		Dackap	5
		Log to Excel	6
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4	A	В	С	D			
1	FileName:DRV-TDMB-8M-183.008.iqw						
2	FileSize:24	065MB					
3	BW:8MHz						
4	Sample Cl	ock:100000	00Hz				
5	Frequency	:183008000	)Hz				
6	Time:601 S	Seconds					
7							
8							
9	Time(s)	Power(dBr	Longitude	Latitude			
10	1	-35.2	126.8871	37.4678			
11	2	-36.4	126.8871	37.4679			
12	3	-35.3	126.8871	37.4679			
13	4	-35.3	126.8871	37.4679			
14	5	-34.6	126.8871	37.468			
15	6	-35.2	126.8871	37.468			

# \* Weiver Signal Tracer

# Introduction

'Weiver Signal Tracer' provides a user information regarding location, power of RF signal, velocity when analyzing the data captured by WEIVER. In many cases, many circumstantial variables makes user have problem to analyze after user captured the data with RF capture equipment. Using map and captured data, Weiver Signal Tracer allows user to analyze the geographical peculiarity such as skyscrapers and tunnels and vehicle's velocity when user was capturing the data. Checking a virtual drive route before a drive test and Searching the geography with address or longitude and altitude is able to do.

Weiver Signal Tracer is based on Google Map API V3 and required the Internet connection. Microsoft Internet Explorer (IE) 7.0 or later version should be installed at user's PC. Loading time for map is varies depending on the network and PC's specification and control name in Graphic User Interface, copyrights notice, navigation, and label in map is followed by the language setting for PC's browsers. Supported language list can be found at the appendix.

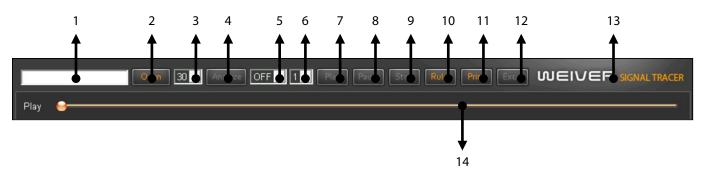


# Specification

Information Window



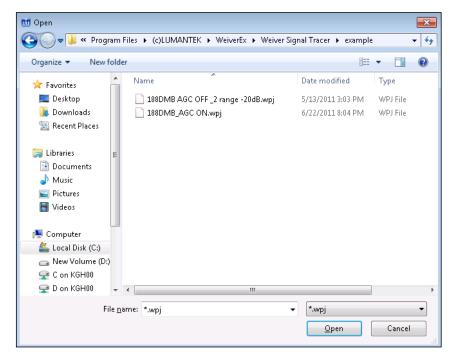
# **Control Menu**



# 1. File Window

Displaying the file's name after choosing a file.

# 2. Open button



Opening Windows to select \*.wpj file.

# 3. Sample Interval

wpj-typed(\*.wpj) file stores information in one second however, for displaying all information at the map and chart needs sufficient time. Therefore user can choose time interval from 5 to 30 seconds to selectively extract information.

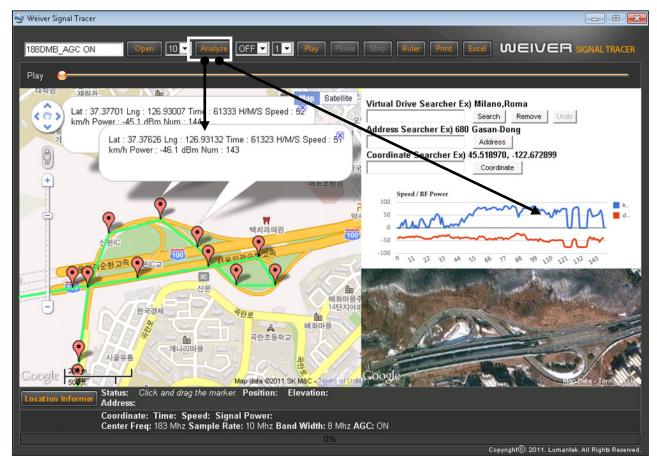
ex) 10 Sec Sample Interval

Time interval between two points in the picture above is 10 seconds (6h 13m 23s ~ 6h 13m 33s)



# 4. Analyze button

Displaying information of wpj file on map and chart, using the sample's time interval. Double-click a marker on the map shows information and click it then information disappear.



# 5. Repeat button

Selecting play mode: one time or repeat .



# 6. Play Time Interval

Play mode basically support in one second. However, increasing sample interval results of various changes since an interval between two points gets away. Play time interval can be controlled at each point by 'play time interval' function.





# 7. Play button

Being based on an analyzed data, user can follow the actual driving route and check information.



# 8. Pause button

# 9. Stop button

If stop button clicks, a map moves to start point.

# 10. Ruler button

User can find out the length with ruler. After estimating the length, if user clicks this button, label about length remains and ruler is disappear. This measurement can be used in multiple times.



Weiver 2.0 Player / Operations Manual

# 11. Print button

User can print out a result through a designated printer.

ieneral Options		-
Select Printer		
Add Printer		-
Haansoft PDF (redirected 1)		÷
HP LaserJet 5100 PCL 6 (redirected 1)		-
• []		۴.
Status: Ready	Print to file Preference	:
Location:	(	-
Comment:	Find Printer.	
Page Range		
O AJ	Number of gopies: 1 💠	
Selection		
Pages: 1	Colate	-
Enter either a single page number or a single page range. For example, 5-12	11223	3

# 12. Excel button

This function supports user to extract an analyzed data as an Excel format file(\*.csv) and open and store the file on user's demand.

	А	В	С	D	E	F	G
1	Number	Latitude	Longitude	Time[UTC]	Speed[km	RF Power[	dBm]
2	0	37.46711	126.8874	54823	0	-38	•
3	1	37.46712	126.8874	54834	0	-38.9	
4	2	37.46712	126.8874	54844	0	-33.9	
5	3	37.46678	126.8876	54855	20	-38.7	
6	4	37.46638	126.8877	5495	9	-39.5	
7	5	37.46613	126.8869	54916	26	-37.9	
8	6	37.46569	126.8859	54926	33	-38.5	
9	7	37.46548	126.8855	54937	0	-35	
10	8	37.46548	126.8855	54947	0	-34.6	
11	9	37.46548	126.8855	54958	0	-34.4	
12	10	37.46541	126.8854	5508	8	-34.7	
13	11	37.46522	126.8847	55019	25	-32.4	
14	12	37.46514	126.8844	55029	0	-37.8	
15	13	37.4651	126.8842	55040	9	-33.1	
16	14	37.4651	126.8842	55050	0	-33.3	
17	15	37.4651	126.8841	5511	0	-35.5	
18	16	37.46533	126.8839	55111	25	-34.7	
19	17	37.46603	126.8833	55122	34	-37.1	
20	18	37.46681	126.8826	55132	36	-37.4	
21	19	37.46749	126.8819	55143	21	-42.8	★
22	20	37.46751	126.8819	55153	9	-43.5	



## 13. Lumantek Webpage

Moving to Lumantek's webpage when user clicks the logo.

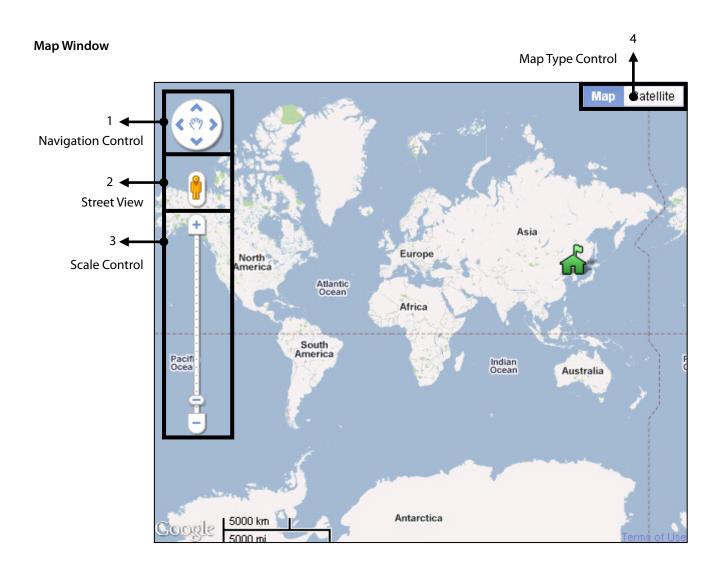
## 14. Play Bar

Displaying the current condition during playing. User can use 'drag and play' function.



## 13. Lumantek Webpage

Moving to Lumantek's webpage when user clicks the logo.



WEIVER 2.0 Player / Operations Manual

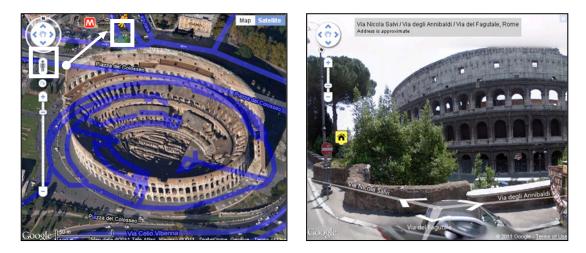
#### 1. Navigation Control

User can control left and right or top and bottom of map by clicking navigation control and the movement of map is possible with mouse's drag.



## 2. Street View

To view street-level imagery for a specific location, click and drag [man icon]  $\Box$  to the location a user wants. Roads with available street-level imagery appear with a blue border. Navigate to the location you want. Zoom in all the way. If street-level imagery is available, it appears when you zoom in all the way. To navigate along a street, a user needs to click one of the white arrows overlaid on the street to move in that direction, or use the arrow keys and to close the view, click [x] button  $\Box$ . The situation of 'Street View service' is varied over the world so please check Google map service at the appendix



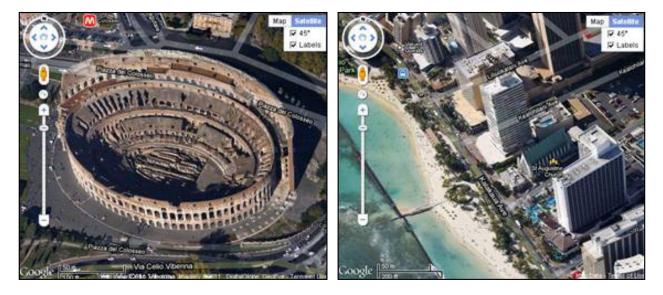
## 3. Scale Control

To expand or reduce the size of map, it can be controlled by clicking a mouse left-button and the other way is a mouse pointer with scroll function; pointing at the location where a user wants can change the size of the map. Double-clicking of mouse left-button at the location on the map makes it expand and doing of mouse right-button makes it reduce. Another way is to push 'shift' key on the map window.



## 4. Map Type Control

Weiver Signal Tracer's default map type is a normal-typed map; however, a user is able to select a satellite map, locating at the right above. A 45° slop satellite map is provided depending on country and region. A map can be rotated 360 degrees at the location where a 45° slop satellite map is provided.





## Search Menu

Virtual Drive Searcher Ex) Milano,Roma			
Search Remove Undo			
Address Searcher Ex) 680 Gasan-Dong	▶ 2		
Address			
Coordinate Searcher Ex) 45.518970, -122.672899	▶ 3		
Coordinate			

## 1. Virtual Drive Searcher

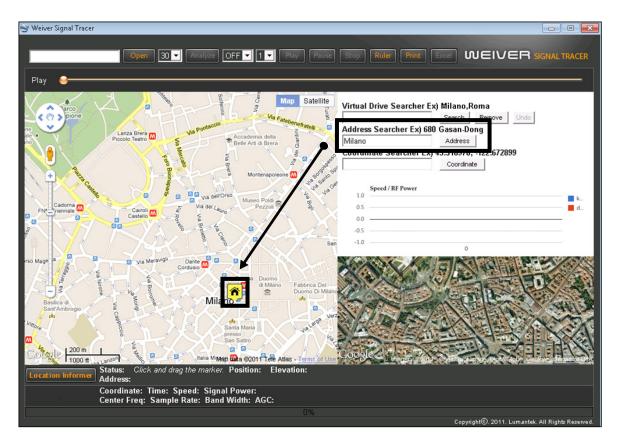
This function supports to search a driving test route before user has. At the route input window, 1) inputting a departure point and an arrival point and then 2) pushing enter or clicking 'Search button.' activates 'Virtual Drive searcher.' When it performs, a scroll bar appears on the right and, if each driving route is clicked, detailed driving routes between the departure point and the arrival point show up. If each driving point is clicked, it leads to being moved to the corresponding location. 'Virtual Drive Searcher' service is varied on each country so please refer to the appendix, 'Google map Service'.

😒 Weiver Signal Tracer	
Play Lautanne Svizzera Swizoriand Bescia Bolzano Viach. Map Satellite Swizoriand Udne Slovenia Sovenia Zagreb Novara Bescia Vicenza Treviso Theste Bescia Vicenza Treviso Rijeka Brasci Brasci Barasci Binasci B	Virtual Drive Searcher Ex) Milano,Roma Milano,Roma Search Remove Undo Address Coordinate Searcher Ex) 45.518970, -122.672899 Coordinate Searcher Ex) 45.518970, -122.672899 Coordinate Logonal Coordinate
ance Antaco Livorno Italia Ancona Spit M Uvorno Italia Ancona Tem Pescara Roha L'Aquia Adriata Sassari. Sardegna Tyrrhenian	

Ŷ	Milan, Italy		
583	3 km- about 5 hours 29 mins	Ĭ	
1.	Head southwest on Via Torino toward Via Spadari	0.6 m	
2.	Continue onto Carrobbio	67 m	
З.	Continue onto Via Cesare Correnti	0.2 km	

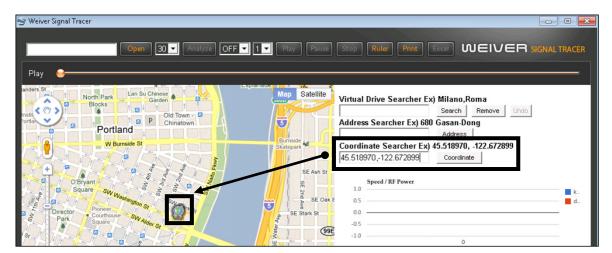
#### 2. Address Searcher

After inputting information regarding the location a user likes to see, pushing 'enter' or clicking 'Address button' activates 'Address searcher' and the searched result displays on the map with a marker. Address searcher service is varied for each country so please refer to the appendix, 'Google map Service'.



#### 3. Coordinate Searcher

After inputting a coordinates which user wants to see at input window, pushing 'enter' or clicking 'coordinate button' activates 'Coordinate Searcher' and the searched result displays on the map with a marker. Entering a coordinates should follow 'WGS-84 Decimal Number Format.'

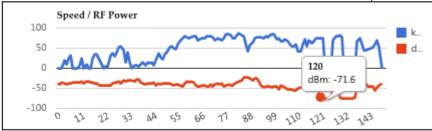




#### **Chart Window**

Chart window displays after analyze. The blue-colored graph is for a velocity of the vehicle and the red-colored graph is for RF signal's power. According to the chart in the above, the signal sharply dropped in two times, approaching mouse pointer to these points makes information of each point indicate at the note. Clicking the note allows it to move the corresponding location in the map (In the tunnel, GPS coordinates cannot be received, therefore clicking any points of tunnel leads to display the latest GPS coordinates).

😂 Weiver Signal Tracer	
188DMB AGC ON Open 10 Analyze OFF 1 Play Pause	
188DMB_AGC ON Open 10 Analyze OFF 1 Play Pause	
Play 😔	
Map         Satellite           Lat: 37.36995 Lng: 126.88718 Time: 6922 H/M/S Speed: 75 km/m           Power: -71.6 dBm Num: 120	Virtual Drive Searcher Ex) Milano,Roma Search Remove Undo Address Searcher Ex) 680 Gasan-Dong Address
	Coordinate Searcher Ex) 45.518970, -122.672899
	50 50 50 50 50 50 50 50 50 50
3 유 안산초등학교 고 200 m 기상사 1000 ft Map data ©2011 SK M&C - Terms of Us	Congle Mep Data - Terms of Use
Location Informer Status: Click and drag the marker. Position: Elevation: Address:	
Coordinate: Time: Speed: Signal Power: Center Freq: 183 Mhz Sample Rate: 10 Mhz Band Width: 8 Mhz	AGC: C N
0%	Copyright© 2011, Lumantek, All Rights Reserved.





#### **Satellite Window**

It is difficult for user to analyze geographical features only with map, in this case, 'Satellite Window' helps user analyze, providing satellite map which shares same center with a map. 'Satellite window' is automatically controlled by map window and, depending on user's needs, can be controlled by mouse drag or wheel (Satellite Window can perform when zoom level of map window is above the certain level).

Image: Control of the control of th	😂 Weiver Signal Tracer	
Play Play		
Play Play	Open 30 - Analyze OFF - 1 - Play Pause	
Percent and a construction of the service of the s		
Virtual Drive Searcher Ex) Miliano,Roma Search Remove Undo Address Searcher Ex) 680 Gasan-Dong Address Searcher Ex) 680 Gasan-Dong Address Searcher Ex) 680 Gasan-Dong Coordinate Search Remove Undo Address Searcher Ex) 680 Gasan-Dong Coordinate Search Remove Undo Address Searcher Ex) 680 Gasan-Dong Main Don Search Remove Undo Address Searcher Ex) 680 Gasan-Dong Main Don Address Searcher Ex) 680 Gasan-Dong Material Searcher Ex) 680 Gasan-Dong Address Searcher Ex) 680 Gasan-Dong Address Searcher Ex) 680 Gasan-Dong Address Searcher Ex) 680 Gasan-Dong Material Searcher Ex) 680 Gas	Play 😝	
Virtual Drive Searcher Ex) Millano, Roma <u>Bearch</u> Romove Undo Address Searcher Ex) Stello Gasan.Domy Milano Address Coordinate Searcher Ex) 45.518970, 122.672899 <u>Coordinate</u> Searcher Ex) 45.518970, 122.67289 <u>Coordinate</u> Searcher E		
Address Searcher Ex) 680 Gasan-Dong Miano Address Cordinate Searcher Ex) 45.518970, 122.672899 Cordinate Speed / RF Power	Via Tivo Var	
Address         Address         Cordinate         Speed / RF Power	( ( ) ) June	
Image: State of the state	June Car	
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Image: diagonal and the product of the data give marker. Position:       Everation:		
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Image: Coreso Magenta       Image: Voltage Magenta       Im	Foro Buonaparte	
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Corso Magenta  vo Meravigli Cordue 200 m Cor		
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Cordus Dante Dante Cordus Dante		
Store Click and drag the marker. Position: Elevation:	Corso Magenta 😁 — Vo Meravigin Dante M	
		GOOSIC Lineary 02911, Cresis Himage Diata Glace, Cebbye - Terms of Use
Address.	Location Informer Status: Click and drag the marker. Position: Elevation: Address:	
Coordinate: Time: Speed: Signal Power: Center Freq: Sample Rate: Band Width: AGC:		
0% Copyright©, 2011, Lumantek, All Rights Reserved		

#### **Information Window**

Location Informer Status: Drag ended Position: 37.46809, 126.88129000000003 Elevation: 11.30368804931641 meter: Address: South Korea Gyeonggi-do Gwangmyeong-si Haan 4(sa)-dong 809-1	6	•-	<b>→</b>	▶ 1
Coordinate: 37.46809,126.88129 Time: 55235 H/M/S Speed: 32 km/h Signal Power: -42.2 dBm Center Freq: 183 Mhz Sample Rate: 10 Mhz Band Width: 8 Mhz AGC: ON		•-		▶ 2
0%		•		▶ 3

- 1. Location Informer Window
- 2. Play & File Information Window
- 3. Progress Bar

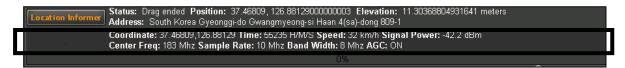
#### 1. Location Informer Window

If a user wants to know address and coordinates of the certain location, clicking 'Location informer button' makes a maker appear in the center of a map. It indicates the coordinates for the nearest address and the altitude based on the average 0 sea level. The marker can be moved by drag & drop of mouse and whenever it moves, it displays new information.

😌 Weiver Signal Tracer 📃 📃
Open 30 V Analyze OFF V 1 V Pause Stop Ruler Print Excel WEIVER SIGNAL TRACES
Cordinate Searcher Ex) Milano,Roma Satellite Satellit
Speed / RJ Power
FINA Trenale Castello
Mar and 200 m Corso Magenta 66 Via Meravigi
Location Informer Address: Piazza Castello, 2, 20121 Milan, Italy
Containate, Time, Speed, Signal Fower. Center Freq: Sample Rate: Band Width: AGC:
0% Copyright©. 2011. Lumantek All Rights Reserv

#### 2. Play & File Information Window

During analyzing, this part shows information (Center Frequency, Sample Rate, Band Width, and AGC) of captured file and, during playing, indicates coordinates, time, velocity, and RF signal power of each point.



#### 3. Progress Bar

During analyzing, progress displays at the 'progress bar'

	Location Informer Status: Drag ended Position: 37.46809, 126.88129000000003 Elevation: 11.30368804931641 meters Address: South Korea Gyeonggi-do Gwangmyeong-si Haan 4(sa)-dong 809-1
	Coordinate: 37.46809,126.88129 Time: 55235 H/M/S Speed: 32 km/h Signal Power: -42.2 dBm Center Free: 183 Mbz Sample Rate: 10 Mbz Rand Width: 8 Mbz AGC: ON
ĺ	0%

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country/region	map tiles	geocoding	street	driving directions
Afghanistan	Yes (Major Roads Only)	Yes (same as tiles)	No	No
Albania	Yes (MapMaker Only)	Yes (same as tiles)	No	Yes (Major Cities Only)
Algeria	Yes	Yes (same as tiles)	No	Yes
American Samoa	Yes (MapMaker Only)	Yes (same as tiles)	No	Yes
Andorra	Yes	Yes (same as tiles)	No	Yes (Major Cities Only)
Anguilla	Yes (MapMaker Only)	Yes (same as tiles)	No	No
Angola	Yes (Major Roads Only)	Yes (same as tiles)	No	Yes
Antigua and Barbuda	Yes	Yes (same as tiles)	No	Yes
Argentina	Yes	Yes (same as tiles)	No	Yes
Armenia	Yes (MapMaker Only)	Yes (same as tiles)	No	Yes
Aruba	Yes (MapMaker Only)	Yes (same as tiles)	No	Yes
Australia	Yes	Yes (same as tiles)	Yes	Yes
Austria	Yes	Yes (same as tiles)	No	Yes
Azerbaijan	Yes (MapMaker Only)	Yes (same as tiles)	No	Yes
Bahamas	Yes (MapMaker Only)	Yes (same as tiles)	No	Yes
Bahrain	Yes (Major Roads, MapMaker Additions)	Yes (same as tiles)	No	Yes
Bangladesh	Yes (Major Roads Only)	Yes (same as tiles)	No	No
Barbados	Yes (Lacks street names)	Yes (same as tiles)	No	Yes
Belarus	Yes (MapMaker Only)	Yes (same as tiles)	No	No
Belgium	Yes	Yes (same as tiles)	No	Yes
Belize	Yes (Major Roads, MapMaker Additions)	Yes (same as tiles)	No	Yes
Benin	Yes (Major Roads, MapMaker Additions)	Yes (same as tiles)	No	Yes
Bermuda	Yes (MapMaker Only)	Yes (same as tiles)	No	Yes
Bhutan	Yes (Major Roads, MapMaker Additions)	Yes (same as tiles)	No	Yes
Bolivia	Yes (Major Roads, MapMaker Additions)	Yes (same as tiles)	No	Yes
Bosnia and Herzegovina	Yes (MapMaker Only)	Yes (same as tiles)	No	No
Botswana	Yes (Major Roads, MapMaker Additions)	Yes (same as tiles)	No	Yes
Brazil	Yes	Yes (same as tiles)	No	Yes
British Indian Ocean Territory	Yes (MapMaker Only)	Yes (same as tiles)	No	No
Brunei	Yes (Major Roads Only)	Yes (same as tiles)	No	No
Bulgaria	Yes (Major Roads Only)	Yes (same as tiles)	No	Yes (Major Cities Only)

# \* Appendix. Google Map Service



Burkina Faso	Yes (Major Roads, MapMaker Additions)	Yes (same as tiles)	No	Yes
Burundi	Yes (Major Roads, MapMaker Additions)	Yes (same as tiles)	No	Yes
Cambodia	Yes (Major Roads, MapMaker Additions)	Yes (same as tiles)	No	No
Cameroon	Yes (Major Roads, MapMaker Additions)	Yes (same as tiles)	No	Yes
Canada	Yes	Yes (same as tiles)	Yes	Yes
Cape Verde	Yes (Major Roads, MapMaker Additions)	Yes (same as tiles)	No	Yes
Cayman Islands	Yes (Major Roads, MapMaker Additions)	Yes (same as tiles)	No	Yes
Central African Republic	Yes (Major Roads, MapMaker Additions)	Yes (same as tiles)	No	Yes
Chad	Yes (Major Roads, MapMaker Additions)	Yes (same as tiles)	No	Yes
Chile	Yes	Yes (same as tiles)	No	Yes
China	Yes	Yes (same as tiles)	No	Yes (Domain-restricted)
Christmas Island				
	Yes (MapMaker Only)	Yes (same as tiles)	No	No
Cocos Islands	Yes (MapMaker Only)	Yes (same as tiles)	No	No
Colombia	Yes	Yes (same as tiles)	No	No
Comoros	Yes (Major Roads, MapMaker Additions	Yes (same as tiles)	No	Yes
Cook Islands	Yes (MapMaker Only)	Yes (same as tiles)	No	Yes
Congo	Yes (Major Roads, MapMaker Additions)	Yes (same as tiles)	No	Yes
Costa Rica	Yes (MapMaker Only)	Yes (same as tiles)	No	Yes
Côte d'Ivoire	Yes (Major Roads Only)	Yes (same as tiles)	No	Yes
Croatia	Yes	Yes (same as tiles)	No	No
Cuba	Yes	Yes (same as tiles)	No	No
Cyprus	No	No	No	No
Czech Republic	Yes	Yes (same as tiles)	Yes	Yes
Denmark	Yes	Yes (same as tiles)	Yes	Yes
Djibouti	Yes (Major Roads, MapMaker Additions)	Yes (same as tiles)	No	Yes
DRC	Yes (Major Roads, MapMaker Additions)	Yes (same as tiles)	No	Yes
Dominica	Yes (Major Roads, MapMaker Additions)	Yes (same as tiles)	No	Yes
Dominican Republic	Yes (Major Roads, MapMaker Additions)	Yes (same as tiles)	No	Yes
Ecuador	Yes	Yes (same as tiles)	No	No
Egypt	Yes	Yes (same as tiles)	No	Yes

El Salvador	Yes (MapMaker Only)	Yes (same as tiles)	No	Yes
Equatorial Guinea	Yes (Major Roads Only)	Yes (same as tiles)	No	Yes
Eritrea	Yes (Major Roads, MapMaker Additions)	Yes (same as tiles)	No	Yes
Estonia	Yes	Yes (same as tiles)	No	Yes (Major Cities Only
Ethiopia	Yes (Major Roads, MapMaker Additions)	Yes (same as tiles)	No	Yes
Fiji	Yes (Major Roads, MapMaker Additions)	Yes (same as tiles)	No	Yes
Finland	Yes	Yes (same as tiles)	Yes	Yes
France	Yes	Yes (same as tiles)	Yes	Yes
French Guiana	Yes (Major Roads Only)	Yes (same as tiles)	No	Yes
Gabon	Yes (Major Roads, MapMaker Additions)	Yes (same as tiles)	No	Yes
Gambia	Yes (Major Roads, MapMaker Additions)	Yes (same as tiles)	No	Yes
Germany	Yes	Yes (same as tiles)	No	Yes
Ghana	Yes (Major Roads, MapMaker Additions)	Yes (same as tiles)	No	Yes
Greenland	Yes (MapMaker Only)	Yes (same as tiles)	Yes	Yes
Greece	Yes	Yes (same as tiles)	No	Yes (Major Cities Only
Grenada	Yes (Lacks street names)	Yes (same as tiles)	No	Yes
Guam	Yes (Major Roads, MapMaker Additions)	Yes (same as tiles)	No	No
Guadeloupe	Yes (MapMaker Only)	Yes (same as tiles)	No	Yes
Guatemala	Yes	Yes (same as tiles)	No	No
Guinea	Yes (Major Roads, MapMaker Additions)	Yes (same as tiles)	No	Yes
Guinea-Bissau	Yes (Major Roads Only)	Yes (same as tiles)	No	Yes
Guyana	No	No	No	Yes
Haiti	Yes	Yes (same as tiles)	No	Yes
Honduras	Yes	Yes (same as tiles)	No	No
Hong Kong	Yes	Yes (same as tiles)	No	Yes
Hungary	Yes	Yes (same as tiles)	No	Yes
Iceland	Yes (Major Roads, MapMaker Additions)	Yes (same as tiles)	Yes	Yes
India	Yes	Yes (same as tiles)	No	No
Indonesia	Yes	Yes (same as tiles)	No	Yes
Iran	Yes (Major Roads, MapMaker Additions)	Yes (same as tiles)	No	Yes
Iraq	Yes (Major Roads Only)	Yes (same as tiles)	No	No
Ireland	Yes	Yes (same as tiles)	No	Yes
Israel	No	No	No	No
Italy	Yes	Yes (same as tiles)	Yes	Yes
Ivory Coast	Yes (MapMaker Only)	Yes (same as tiles)	No	No
Jamaica	Yes	Yes (same as tiles)	No	Yes

Japan	Yes	Yes (same as tiles)	Yes	No
Jordan	Yes (Lacks street names)	Yes (same as tiles)	No	Yes
Kazakhstan	Yes (Major Roads Only)	Yes (same as tiles)	No	No
Kenya	Yes (Major Roads Only)	Yes (same as tiles)	No	No
Kiribati	No	No	No	No
Kuwait	Yes (Major cities only)	Yes (same as tiles)	No	No
Kyrgyzstan	Yes (Major Roads, MapMaker Additions)	Yes (same as tiles)	No	Yes
Laos	Yes (MapMaker Only)	Yes (same as tiles)	No	Yes
Latvia	Yes	Yes (same as tiles)	No	Yes (Major Cities Only
Lebanon	Yes	Yes (Lacks street numbers/some towns)	No	Yes
Lesotho	Yes (Major Roads Only)	Yes (same as tiles)	No	No
Liberia	Yes (Major Roads Only)	Yes (same as tiles)	No	Yes
Libya	Yes	Yes (same as tiles)	No	Yes
Liechtenstein	Yes	Yes (same as tiles)	No	Yes
Lithuania	Yes	Yes (same as tiles)	No	Yes (Major Cities Only
Luxembourg	Yes	Yes (same as tiles)	No	Yes
Macau	Yes	Yes (same as tiles)	No	No
Macedonia	Yes (MapMaker Only)	Yes (same as tiles)	No	Yes (Major Cities Only
Madagascar	Yes (Major Roads, MapMaker Additions)	Yes (same as tiles)	No	Yes
Malawi	Yes (Major Roads, MapMaker Additions)	Yes (same as tiles)	No	Yes
Malaysia	Yes	Yes (same as tiles)	No	Yes
Maldives	No	No	No	Yes
Mali	Yes (MapMaker Only)	Yes (same as tiles)	No	Yes
Malta	No	No	No	Yes
Marshall Islands	Yes (MapMaker Only)	Yes (same as tiles)	No	Yes
Martinique	Yes (MapMaker Additions)	Yes (same as tiles)	No	Yes
Mauritania	Yes (Major Roads, MapMaker Additions)	Yes (same as tiles)	No	Yes
Mauritius	Yes (Major Roads, MapMaker Additions)	Yes (same as tiles)	No	Yes
Mexico	Yes	Yes (same as tiles)	Yes	No
Micronesia	Yes (MapMaker Only)	Yes (same as tiles)	No	No
Moldova	Yes (MapMaker Only)	Yes (same as tiles)	No	Yes (Major Cities Only
Monaco	Yes	Yes (same as tiles)	No	Yes (Major Cities Only
Mongolia	Yes (Major Roads, MapMaker Additions)	Yes (same as tiles)	No	No



Montenegro	Yes (MapMaker Only)	Yes (same as tiles)	No	Yes (Major Cities Only			
Montserrat	Yes (MapMaker Only)	Yes (same as tiles)	No	Yes			
Morocco	Yes (Lacks street names)	Yes (same as tiles)	No	Yes			
Mozambique	Yes (Major Roads, MapMaker Additions)	Yes (same as tiles)	No	Yes			
Myanmar	Yes (MapMaker Only)	Yes (same as tiles)	No	No			
Namibia	Yes (Major Roads Only)	Yes (same as tiles)	No	Yes			
Nauru	Yes (MapMaker Only)	Yes (same as tiles)	No	No			
Nepal	Yes (Major Roads Only)	Yes (same as tiles)	No	No			
Netherlands	Yes	Yes (same as tiles)	Yes	Yes			
Netherlands Antilles	Yes (MapMaker Only)	Yes (same as tiles)	No	Yes			
New Zealand	Yes	Yes (same as tiles)	Yes	Yes			
Nicaragua	Yes	Yes (same as tiles)	No	No			
Niger	Yes (Major Roads, MapMaker Additions)	Yes (same as tiles)	No	Yes			
Nigeria	Yes (Major Roads, MapMaker Additions)	Yes (same as tiles)	No	Yes			
Niue	Yes (MapMaker Only)	Yes (same as tiles)	No	Yes			
Northern Mariana Islands	Yes (MapMaker Only)	Yes (same as tiles)	No	Yes			
North Korea	No	No	No	No			
Norway	Yes	Yes (same as tiles)	Yes	Yes			
Oman	Yes (Major cities only)	Yes (same as tiles)	No	No			
Pakistan	Yes (Major Roads, MapMaker Additions)	Yes (same as tiles)	No	No			
Palau	No	No	No	Yes			
Panama	Yes	Yes (same as tiles)	No	No			
Papua New Guinea	Yes (Major Roads Only)	Yes (same as tiles)	No	Yes			
Paraguay	Yes (Major Roads, MapMaker Additions)	Yes (same as tiles)	No	Yes			
Peru	Yes (Major Roads, MapMaker Additions)	Yes (same as tiles)	No	Yes			
Philippines	Yes (Major Roads, MapMaker Additions)	Yes (same as tiles)	No	No			
Pitcairn Islands	Yes (MapMaker Only)	Yes (same as tiles)	No	No			
Poland	Yes	Yes (same as tiles)	No	Yes			
Portugal	Yes	Yes (same as tiles)	Yes	Yes			
Qatar	Yes (Major cities only)	Yes (same as tiles)	No	Yes			
Reunion	Yes (MapMaker Only)	Yes (same as tiles)	No	Yes			
Romania	Yes (MapMaker Only)	Yes (same as tiles)	No	No			
Russia	Yes	Yes (In local character set only)	Yes	Yes (Moscow + Suburk Only)			

Rwanda	Yes (Major Roads, MapMaker Additions)	Yes (same as tiles)	No	Yes		
Saint Helena	Yes (MapMaker Only)	Yes (same as tiles)	No	No		
Saint Kitts and Nevis	Yes	Yes (same as tiles)	No	No		
Saint Vincent and the Grenadines	Yes (MapMaker Only)	Yes (same as tiles)	No	Yes		
Saint Lucia	Yes	Yes (same as tiles)	No	Yes		
Samoa	Yes (MapMaker Only)	Yes (same as tiles)	No	Yes		
San Marino	Yes	Yes (same as tiles)	No	Yes (Major Cities Only)		
São Tomé and Príncipe	Yes (Major Roads, MapMaker Additions)	Yes (same as tiles)	No	Yes		
Saudi Arabia	Yes (Major cities only)	Yes (same as tiles)	No	No		
Senegal	Yes (Major Roads, MapMaker Additions)	Yes (same as tiles)	No	Yes		
Serbia	Yes (MapMaker Only)	Yes (same as tiles)	No	Yes (Major Cities Only)		
Seychelles	Yes (Major Roads, MapMaker Additions)	Yes (same as tiles)	No	Yes		
Sierra Leone	Yes (Major Roads, MapMaker Additions)	No	Yes			
Singapore	Yes	Yes (same as tiles)	Yes	Yes		
Slovakia	Yes	Yes (same as tiles)	No	Yes (Major Cities Only)		
Slovenia	Yes	Yes (same as tiles)	No	No		
Solomon Islands	Yes (MapMaker Only)	Yes (same as tiles)	No	Yes		
Somalia	Yes (Major Roads, MapMaker Additions)	Yes (same as tiles)	No	Yes		
South Africa	Yes	Yes (same as tiles)	No	Yes		
South Korea	Yes (Domain-restricted)	Yes (same as tiles)	No	No		
Spain	Yes	Yes (same as tiles)	Yes	Yes		
Sri Lanka	Yes (Major Roads, MapMaker Additions)	Yes (same as tiles)	No	No		
Sudan	Yes (Major Roads Only)	Yes (same as tiles)	No	Yes		
Suriname	No	No	No	Yes		
Swaziland	Yes (Major Roads Only)	Yes (same as tiles)	No	Yes		
Sweden	Yes	Yes (same as tiles)	Yes	Yes		
Switzerland	Yes	Yes (same as tiles)	Yes	Yes		
Syria	Yes (Major Roads Only)	Yes (same as tiles)	No	No		
Taiwan	Yes	Yes (In local character set only)	Yes	Yes		
Tajikistan	Yes (Major Roads, MapMaker Additions)	Yes (same as tiles)	No	Yes		
Tanzania	Yes (Major Roads, MapMaker Additions)	Yes (same as tiles)	No	Yes		
Thailand	Yes	Yes (same as tiles)	No	Yes		
Timor-Leste	Yes (Major Roads Only)	Yes (same as tiles)	No	Yes		
Tokelau	Yes (MapMaker Only)	Yes (same as tiles)	No	No		

# \* Appendix. Google Map Language Service

language code	language name	v3				
ar	ARABIC	Yes				
eu	BASQUE	Yes				
bg	BULGARIAN	Yes				
bn	BENGALI	Yes				
са	CATALAN	Yes				
CS	CZECH	Yes				
da	DANISH	Yes				
de	GERMAN	Yes				
el	GREEK	Yes				
en	ENGLISH	Yes				
en-AU	ENGLISH (AUSTRALIAN)	Yes				
en-GB	ENGLISH (GREAT BRITAIN)	Yes				
es	SPANISH	Yes				
eu	BASQUE	Yes				
fa	FARSI	Yes				
fi	FINNISH	Yes				
fil	FILIPINO	Yes				
fr	FRENCH	Yes				
gl	GALICIAN	Yes				
gu	GUJARATI	Yes				
hi	HINDI	Yes				
hr	CROATIAN	Yes				
hu	HUNGARIAN	Yes				
id	INDONESIAN	Yes				
it	ITALIAN	Yes				
iw	HEBREW	Yes				
ja	JAPANESE	Yes				
kn	KANNADA	Yes				
ko	KOREAN	Yes				
lt	LITHUANIAN	Yes				
lv	LATVIAN	Yes				
ml	MALAYALAM	Yes				
mr	MARATHI	Yes				
nl	DUTCH	Yes				
nn	NORWEGIAN NYNORSK	No				
no	NORWEGIAN	Yes				
or	ORIYA	No				
pl	POLISH	Yes				
pt	PORTUGUESE	Yes				

pt-BR	PORTUGUESE (BRAZIL)	Yes
pt-PT	PORTUGUESE (PORTUGAL)	Yes
rm	ROMANSCH	No
ro	ROMANIAN	Yes
ru	RUSSIAN	Yes
sk	SLOVAK	Yes
sl	SLOVENIAN	Yes
sr	SERBIAN	Yes
SV	SWEDISH	Yes
tl	TAGALOG	Yes
ta	TAMIL	Yes
te	TELUGU	Yes
th	THAI	Yes
tr	TURKISH	Yes
uk	UKRAINIAN	Yes
vi	VIETNAMESE	Yes
zh-CN	CHINESE (SIMPLIFIED)	Yes
zh-TW	CHINESE (TRADITIONAL)	Yes



## • Play File Converting Util

S Internet Explorer	
Twindows Update	Weiver
XPS Viewer	
📗 (c)LUMANTEK	Documents
🐌 T-Pump	Pictures
📗 WeiverCom	Fictures
🍌 WeiverEx	Music
🛃 Uninstall WeiverEx	
🚾 WeiverEx	Games
🚾 WeiverFileConverterUtil	
Accessories	Computer
📔 Games	
퉲 Lumantek	Control Panel
📗 Maintenance	
🕼 Startup	Devices and Printers
Subsystem for UNIX-based Applications	
🎼 VideoLAN	Default Programs
	Help and Support
	Help and Support
	Windows Security

Click the start button on your OS and select WeiverFlleConverterUtil inside Weiver\_EX Program.

Once you get the window for converting, 'Complex type' files can be played on WEIVER 2.0 Player.

For Real type file, WeiverFileConverterUtil converts it into a Complex type file and generates Log data. For the Complex type file, Log data is generated.

When Real type file is converted, two files generate with \*.iqw and \*.wpj extensions. In case of converting the Complex type file, Log data will be generated and one file with wpj extension.

ŵ	Weiver2File	eConverte	rUtil-2.0.0.4-2013070	)5			×
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	No		File	Format	I Rate(Hz)	Frequency(Hz)	Result
	Click I Ra	ite, Freque	ency		Add list	Remove Lis	t Remove All
				Start Conve	erter		

## 4.8 / Weiver\_EX Program Introduction

When the Weiver\_EX program is initiated, the WEIVER unit is not yet connected. To proceed with connecting the WEIVER 2.0 Player, follow the following sequence:

WeiverEx-2.2.1.0-20130401 - Gps - 🗆 X Control Mode Analyzer View Setting Util Help 192.168.10.41 · ELQOMD Play \* 14/ 🙀 Gps 10 Weiver IP List Weiver IP WeiverCom Ver HW Ver Description License State 1.1.0.1(V:4) 192.168.10.58 WEEC10013 Capture(8M,24M),Play(8M,24M) Unlock 2.1.1.6 37.3675 N Google Ma METROTOWN BLOCK CENTR BURNABY IP Update New We 0 GB 0 GB Capacity Freespace ✓ Auto Next 000 MHz IQ Rate 00:00:04 / 00:00:32 File Name REF 24M 0dBm.wp Ref Int 120 MB/

#### Select Main Menu -> Control-> Connect the device and search WEIVER 2.0 Player

To connect with WEIVER 2.0 Player, a separate WEIVER 2.0 Player IP List sub-window will appear. There are various methods of connecting the WEIVER 2.0 Player. To connect through IP, the subnet of the WEIVER 2.0 Player unit and control PC must be matched to connect for security purposes properly.



Once the WEIVER 2.0 Player has successfully connected another window will display "<u>Connected!</u>"



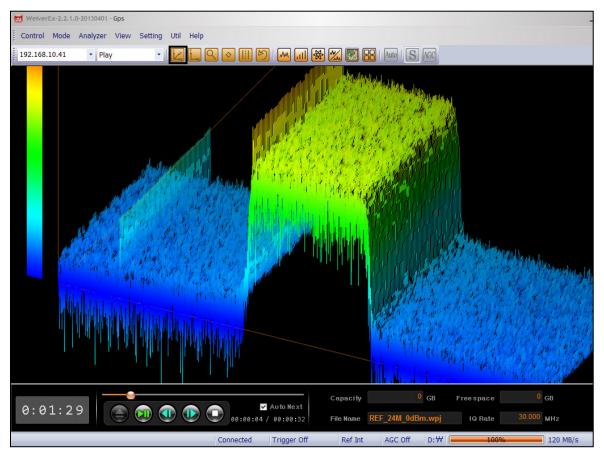
Once the WEIVER 2.0 Player has successfully connected.

## Analyzer Menu



The Analyzer Menu has five kinds of features in measuring or observing the Spectrum from Zoom to Undo. (3D Spectrum Analyzer, 2D Spectrum Analyzer, Spectrum Zoom in Analyzer, Spectrum Power Marker, Band Power Analyzer, State Undo)





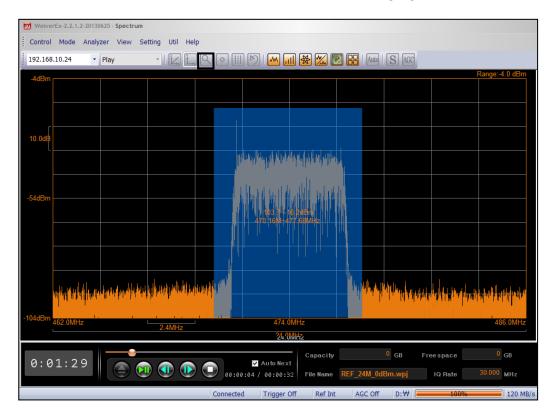


WEIVER 2.0 Player / Operations Manual

Control Mode Analyzer View Setting Util Help 192.168.10.24 • Play • C • E • M • • • • • • • • • • • • • • • •	WeiverEx-2.2.1.2-20130625 - Spec	strum					
4dBm       Range-4.0 d         10.0d8       Image: 4.0 d         10.0d8       Image: 4.0 d         -54dBm       Image: 4.0 d         -54dBm       Image: 4.0 d         -104dBm       Image: 4.0 d         462.0MHz       Image: 4.0 d         2.4MHz       474.0MHz         486.0M         24.0MHz       486.0M	Control Mode Analyzer View	w Setting Util Help					
10.0d8	192.168.10.24 • Play	- I [k] [L Q 📀.	💷 🕑   📶 🔂	) 💹 💽 🔡 🗠	to S AGC		
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-54dBm -54dBm -104dBm 462.0MHz 2.4MHz 2.4MHz 486.0M 486.0M 486							
-54dBm -54dBm -104dBm 462.0MHz 2.4MHz 2.4MHz 486.0M 486.0M 486							
-54dBm -54dBm -54dBm -104dBm 452.0MHz 2.4MHz -104dBm 422.0MHz -104dBm 422.0MHz -104dBm 422.0MHz -104dBm 422.0MHz -104dBm -1	г — — — — — — — — — — — — — — — — — — —						
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0:01:29       Image: Constraint of the state of the stat		•		Capacity	0 GB	Freespace	0
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Connected Trigger Off Ref Int AGC Off D: W							

3 Spectrum Zoom in Analyzer

Zoom on the area by clicking first on the left mouse button and dragging to the preferred point and then clicking on the left mouse button. The area the user has selected will be highlighted.





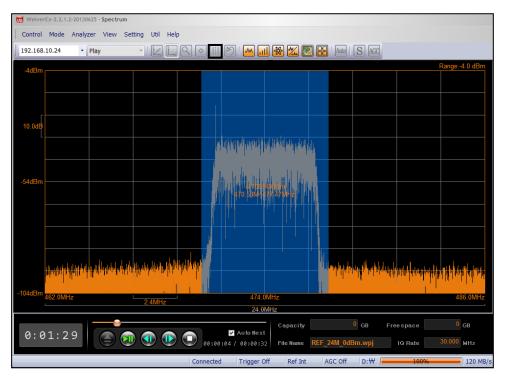
If you want to zoom back to the previous screen, or to the original state, click of Marco Ctrl and Z.

or simultaneously press

WeiverEx-2.2.	1.2-20130625 - Spec	etrum							-
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		-20.4dBm 471.31MHz							
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-200DIII							النكارانيا		
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0:01:2		) 💽 💽 🕕		Auto Ne:	xt	REF_24M_0c			30.000 MH

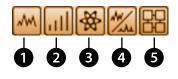
5 Band Power Analyzer

The Band Power can be measured by clicking the left mouse button and dragging. Once the area has been selected, clicking the left mouse button will disengage and the results will be shown.



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View Menu



Weiver\_EX has four sub-windows (with dedicated functions) in the main window. Each sub-window can be repositioned and resized. Further, the Auto Window Position function will automatically resize and reposition the five windows by Auto Win Position. (Spectrum Window, Power Window, GPS Window, I/Q Window, Auto Window Position)

# 2 Power Graph

I,Q data power values and the down converter's actual gain value will be calculated in second by second and displayed. Values in the power graph are the actual coming RF IN power.

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		lyzer View Se								
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					-9.6dBm 00:06:15					
10dB										
-40dBm										
-90dBm	00:00:00									00:16:40
								<sup>0</sup> GB Fre		0 <sub>GB</sub>
0:0	91:29		) 🕕 🕩	00:00	✓ Auto Next 0:04 / 00:00:32	Capacity File Name	REF_24M_0dE		espace IQ Rate	<sup>0</sup> GB 30.000 <sub>MHz</sub>
				Connected	d Trigger O	ff Ref Int	AGC Off	D:₩	100%	120 MB/s





Displays current location (latitude, longitude) coordinates updated in every second.

9 WeiverEx:2.1.2-20130425-GPS
Control Mode Analyzer View Setting Util Help
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0:01:29 Capacity 0 GB Free space 0 GB File Name REF_24M_0dBm.wpj IQ Rate 300000 MHz
ne sizes of the Spectrum Graph 🚧 , IQ Graph 搣 Power Graph 📶 , GPS Graph 🙀 can be adjusted at th Ime time.



In the capture mode, there is an advantage to capture while the user's looking at I, Q graphs. I, Q is assigned 16bit integer value (maximum value 32,767, the minimum -32,768) and when transmitting arbitrary I, Q files created by users, WEIVER 2.0 Player will produce the most excellent RF signal when I/Q 16 bit signal has full swing.

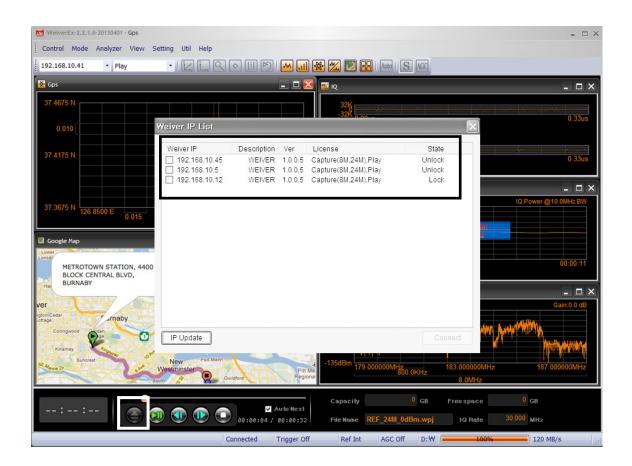
192.168.		Analy.	zer \ Play	View	Set					) [ <		][		M 🔒	1	2	<u>(</u>			Auto	S	AG	3					
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	0.00ms																											1.09

• Play Mode

The data files stored in a capture mode are generated in two types(File Name.iqw, File Name.log). File Name.iqw is stored in the order of [I : 2Bytes, Q 2Bytes], File Name.log includes the records of Name.iqw file additional information. If File Name.log doesn't exist, Bandwidth is represented by the ARB, you can play the file by typing IQ rate and the Center Frequency.

To play back the captured RF data files. Please open the list of captured data files.

Click on the File Open button



Сору	
	ATSC_Capture.bin
	]
0/1	1/1
Select 🗸	Copy Cancel

To delete a saved file, check the box next to the file name and click the Delete button.

To backup or to copy the files, check the boxes adjacent to the file name and click the Copy button. Select the save path (e.g., E:\)

To play, check the relevant box adjacent to the file and click the play butto

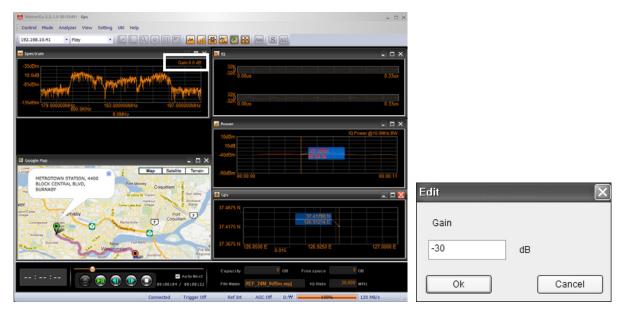


To stop play, click on the Stop buttor



Werver(Ex-2.2.1.0-20130401-Gps Control Mode Analyzer View Setting Util Help	. ¤ ×	
192.168.10.41 🔻 Play 🔹 🛃 🔍 🔿 🔠 🖄 📷 🛃	8 🔀 🛃 🔤 IS 💷	
🔐 Spectrum 📃 🗆 🗙	- D X	
3668m Cain 0.0 d8	300 1 40	
-135480m 175 0000000 80 04042 185 0000000452 187 0000000472		
	Power _ D X	
Coople Plap - C X	10 Power @ 10 MHz BW 10 dBm 40 dBm 90 dBm b0 00 00 00 00 00 00 11	
METROTOWN STATION, 4400 BLOCK CENTRAL BLVD, BUCKABY Coguitam		
Har BUNNEDT	📓 Gps 📃 🗖 🔀	Edit 🗙
Ver Come Lan Are Vilage Maint	37.4675 N	
Consention Consentita Consentita Consentita Consentita Consentita Consentita	37.4175 N	Center Frequency
New Porter Print Name	37.3675 N 126.8500 E 0.015 126.9250 E 127.0000 E	474.000000 MHz
:	Capacity         0         GB         Freespace         0         GB           File Name         REF_24M_0dDm.wpj         10 Rate         30.000         MHz	Ok Cancel
Connected Trigger Off	Ref Int AGC Off D:W 100% 120 MB/s	

The frequency can be changed with the mouse wheel or by double-clicking and entering in the figures.



The transmission power can be changed with the mouse wheel or by double-clicking and entering the figures.

# **API** for WEIVER & WEIVER 2.0 Player



By LUMANTEK



## 5. API OPERATION

## 5.1 / API Description

There are three ways to control the Weiver 2.0 Player

- 1. Using the buttons at the front panel
- 2. Using an operating software, the Weiver\_Ex
- 3. Using API

The first and second methods are supported all previous versions of the WeiverPlayer software, however, the third method can be supported from the WeiverPlayer software version 2.1.2.0. Hence, if previous version is installed in the WeiverPlayer, API function is not able to use.



[ WEIVER 2.0 Player ]



[ WEIVER 2.0 Player Software ]

## 5.2 / WeiverPlayer API Performance Property

The Weiver\_Ex software connects the Weiver 2.0 Player software as IP and send UDP packets to run the Weiver 2.0 Player.

We have opened the WeiverPlayer API example program and packet information because the purpose of the WeiverPlayer API is to control the Weiver 2.0 Player without the Weiver\_Ex software. You can download reference sources at Lumantek website. ( http://www.lumantek.com/support/download.html )



The contents in the below are the structure of API packets (ref.:WvPlayerRemoteAPI.h).

#define	WEIVER_PLAYER_ID	0x057b50b7
#define	WEIVER_PLAYER_API_RX_PORT	50504
#define	REMOTE_STRING_SUCCESS _T("Rec	ceived")
#define	REMOTE_STRING_INVALIDE_PARAN	∕I _T("Invalid Param")
typedef enu	m _WvPlayerRemoteCMD_e	
{		
WV_PL	AYER_REMOTE_CMD_SET_STRING,	
WV_PL	AYER_REMOTE_CMD_MAX	
}WvPlayerRe	moteCMD_t;	
typedef struc	ct _WvPlayerRemotePacket_t	
{		
unsigne	ed int u4_ID;// WEIVER_PLAYER_ID	
unsigne	ed int u4_Reserved;//WV_PLAYER_RE	MOTE_CMD_SET_STRING
unsigne	ed int u4_DataSize;	
unsign	ed char u1a_Data[1000];	
}WvPlayerRe	motePacket_t, *WvPlayerRemotePack	ket_tp;

For controlling the WeiverPlayer via API, an UDP Port (50504) has been opened. Hence, if data is added to 'WvPlayerRemotePacket' structure, the WeiverPlayer program is running with these packet data.

These open sources are for Windows but can be applied to other OSs. Before explaining the command list, we have five conditions of the program (WeiverPlayerRemoteAPI.exe).

- 1. IP address of the WeiverPlayer is 192.168.100.1.
- 2. An opened port number for API control is 50504 (fixed).
- 3. After sending packet to the WeiverPlayer 1.0, a receiving port number is 50000 (variable).
- 4. One letter accounts for 2 byte respectively.
- 5. After sending the packet, 'Time out' occurs if there is no response.

## 5.3 / Data Packet Structure

# [ connect 50000 ]

Туре	ID	Reserved	Data Size	Data
Data	0x057b50b7	0	26	L"connect 50000"
Size(Byte)	4	4	4	13x2

# [ disconnect ]

Туре	ID	Reserved	Data Size	Data
Data	0x057b50b7	0	10x2	L"disconnect"
Size(Byte)	4	4	4	10x2

# [ rescandisk ]

Туре	ID	Reserved	Data Size	Data
Data	0x057b50b7	0	20	L"rescandisk"
Size(Byte)	4	4	4	10x2

# [ openfile test.wpj ]

Туре	ID	Reserved	Data Size	Data
Data	0x057b50b7	0	34	L"openfile test.wpj"
Size(Byte)	4	4	4	17x2

# [get openfile]

Туре	ID	Reserved	Data Size	Data
Data	0x057b50b7	0	24	L"get openfile"
Size(Byte)	4	4	4	12x2

# [ play start ]

Туре	ID	Reserved	Data Size	Data
Data	0x057b50b7	0	24	L"get openfile"
Size(Byte)	4	4	4	12x2



# [ play stop ]

Туре	ID	Reserved	Data Size	Data
Data	0x057b50b7	0	18	L"play stop"
Size(Byte)	4	4	4	9x2

# [ play pause ]

Туре	ID	Reserved	Data Size	Data
Data	0x057b50b7	0	20	L"play pause"
Size(Byte)	4	4	4	10x2

# [ play resume ]

Туре	ID	Reserved	Data Size	Data
Data	0x057b50b7	0	22	L" play resume"
Size(Byte)	4	4	4	11x2

# [ get play\_status ]

Туре	ID	Reserved	Data Size	Data
Data	0x057b50b7	0	30	L"get play_status"
Size(Byte)	4	4	4	15x2

# [ set freq 40000000 ]

Туре	ID	Reserved	Data Size	Data
Data	0x057b50b7	0	36	L"set freq 400000000"
Size(Byte)	4	4	4	18x2

# [ set freq 40000000 hz ]

Туре	ID	Reserved	Data Size	Data
Data	0x057b50b7	0	42	L"set freq 400000000 hz"
Size(Byte)	4	4	4	21x2



# [ set freq 400 mhz ]

Туре	ID	Reserved	Data Size	Data
Data	0x057b50b7	0	38	L"set freq 400000 khz"
Size(Byte)	4	4	4	19x2

# [ set freq 400000 khz ]

Туре	ID	Reserved	Data Size	Data
Data	0x057b50b7	0	38	L"set freq 400000 khz"
Size(Byte)	4	4	4	19x2

# [get freq]

Туре	ID	Reserved	Data Size	Data
Data	0x057b50b7	0	16	L"get freq"
Size(Byte)	4	4	4	8x2

# [ get gain\_min ]

Туре	ID	Reserved	Data Size	Data
Data	0x057b50b7	0	24	L"get gain_max"
Size(Byte)	4	4	4	12x2

[ get gain ]

Туре	ID	Reserved	Data Size	Data
Data	0x057b50b7	0	16	L"get gain"
Size(Byte)	4	4	4	8x2

# [ get rf\_out\_level 1 ]

Туре	ID	Reserved	Data Size	Data
Data	0x057b50b7	0	36	L"get rf_out_level 1"
Size(Byte)	4	4	4	18x2



# [ set gain 100 ]

Туре	ID	Reserved	Data Size	Data
Data	0x057b50b7	0	24	L"set gain 100"
Size(Byte)	4	4	4	12x2

# [ set gain -100 ]

Туре	ID	Reserved	Data Size	Data
Data	0x057b50b7	0	26	L"set gain -100"
Size(Byte)	4	4	4	13x2

# [ get play\_time\_total ]

Туре	ID	Reserved	Data Size	Data
Data	0x057b50b7	0	38	L"get play_time_total"
Size(Byte)	4	4	4	19x2

# [ get play\_time\_current ]

Туре	ID	Reserved	Data Size	Data
Data	0x057b50b7	0	42	L"get play_time_current"
Size(Byte)	4	4	4	21x2

# [ set play\_time\_current 5 ]

Туре	ID	Reserved	Data Size	Data
Data	0x057b50b7	0	46	L"set play_time_current 5"
Size(Byte)	4	4	4	23x2

# [ get play\_section ]

Туре	ID	Reserved	Data Size	Data
Data	0x057b50b7	0	32	L"get play_section"
Size(Byte)	4	4	4	16x2

# [ get play\_section ]

Туре	ID	Reserved	Data Size	Data
Data	0x057b50b7	0	32	L"get play_section"
Size(Byte)	4	4	4	16x2

# [ set play\_section 10 20 ]

Туре	ID	Reserved	Data Size	Data
Data	0x057b50b7	0	44	L"set play_section 10 20"
Size(Byte)	4	4	4	22x2

# [ get spec\_inv ]

Туре	ID	Reserved	Data Size	Data
Data	0x057b50b7	0	24	L"get spec_inv"
Size(Byte)	4	4	4	12x2

# [ set spec\_inv off ]

Туре	ID	Reserved	Data Size	Data
Data	0x057b50b7	0	32	L"set spec_inv off"
Size(Byte)	4	4	4	16x2

## [ set spec\_inv on ]

Туре	ID	Reserved	Data Size	Data
Data	0x057b50b7	0	30	L"set spec_inv on"
Size(Byte)	4	4	4	15x2

# [ get sample\_rate ]

Туре	ID	Reserved	Data Size	Data
Data	0x057b50b7	0	30	L"get sample_rate"
Size(Byte)	4	4	4	15x2

# [ set sample\_rate 10000000 ]

Туре	ID	Reserved	Data Size	Data
Data	0x057b50b7	0	48	L"set sample_rate 10000000"
Size(Byte)	4	4	4	24x2

## [ set sample\_rate 1000000 hz ]

Туре	ID	Reserved	Data Size	Data
Data	0x057b50b7	0	54	L"set sample_rate 10000000 hz"
Size(Byte)	4	4	4	27x2

# [ set sample\_rate 10 mhz ]

Туре	ID	Reserved	Data Size	Data
Data	0x057b50b7	0	44	L"set sample_rate 10 mhz"
Size(Byte)	4	4	4	22x2

# [ set sample\_rate 10000 khz ]

Туре	ID	Reserved	Data Size	Data
Data	0x057b50b7	0	54	L"set sample_rate 10000 khz"
Size(Byte)	4	4	4	27x2

## [ set trigger\_out\_level low ]

Туре	ID	Reserved	Data Size	Data
Data	0x057b50b7	0	50	L"set trigger_out_level low"
Size(Byte)	4	4	4	25x2

# [ set trigger\_out\_level high ]

Туре	ID	Reserved	Data Size	Data
Data	0x057b50b7	0	52	L"set trigger_out_level low"
Size(Byte)	4	4	4	26x2

# [ get trigger\_out\_level ]

Туре	ID	Reserved	Data Size	Data
Data	0x057b50b7	0	42	L"get trigger_out_level"
Size(Byte)	4	4	4	21x2

# [ set extclk off ]

Туре	ID	Reserved	Data Size	Data
Data	0x057b50b7	0	28	L"set extclk off"
Size(Byte)	4	4	4	14x2

# [ set extclk on ]

Туре	ID	Reserved	Data Size	Data
Data	0x057b50b7	0	26	L"set extclk on"
Size(Byte)	4	4	4	13x2

# [ get extclk ]

Туре	ID	Reserved	Data Size	Data
Data	0x057b50b7	0	20	L"get extclk"
Size(Byte)	4	4	4	10x2

# [ get trigger\_in ]

Туре	ID	Reserved	Data Size	Data
Data	0x057b50b7	0	28	L"get trigger_in"
Size(Byte)	4	4	4	14x2

# [ set trigger\_in off ]

Туре	ID	Reserved	Data Size	Data
Data	0x057b50b7	0	36	L"set trigger_in off"
Size(Byte)	4	4	4	18x2

# [ set trigger\_in on ]

Туре	ID	Reserved	Data Size	Data
Data	0x057b50b7	0	34	L"set trigger_in on"
Size(Byte)	4	4	4	17x2

# [ set current\_directory d:\ ]

Туре	ID	Reserved	Data Size	Data
Data	0x057b50b7	0	50	L"set current_directory d:\"
Size(Byte)	4	4	4	25x2

# [ set current\_directory d:\WeiverData ]

Туре	ID	Reserved	Data Size	Data
Data	0x057b50b7	0	70	L"set current_directory d:\WeiverData"
Size(Byte)	4	4	4	35x2

# [ get current\_directory ]

Туре	ID	Reserved	Data Size	Data
Data	0x057b50b7	0	42	L"get current_directory"
Size(Byte)	4	4	4	21x2

# [ get file\_count ]

Туре	ID	Reserved	Data Size	Data
Data	0x057b50b7	0	28	L"get file_count"
Size(Byte)	4	4	4	14x2

# [get filename 0]

Туре	ID	Reserved	Data Size	Data
Data	0x057b50b7	0	28	L"get filename 0"
Size(Byte)	4	4	4	14x2



# [ get folder\_count ]

Туре	ID	Reserved	Data Size	Data
Data	0x057b50b7	0	32	L"get folder_count"
Size(Byte)	4	4	4	16x2

# [get foldername 0]

Туре	ID	Reserved	Data Size	Data
Data	0x057b50b7	0	32	L"get foldername 0"
Size(Byte)	4	4	4	16x2



## 5.4 / Command List

- Connect, disconnect command,
  - Example) 1. connect 50000, 2. disconnect

D:\Weiver\SW\EXE\WeiverPlayerRemoteAPI.exe

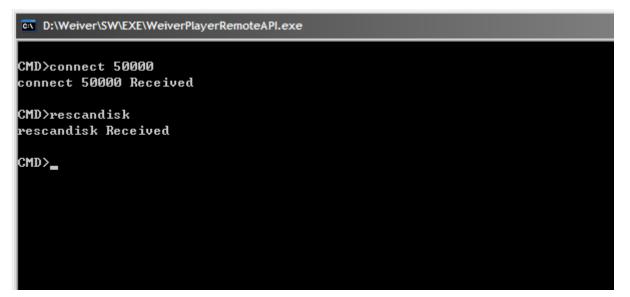
CMD≻connect 50000 connect 50000 Received

CMD>disconnect disconnect Received

CMD>

• rescandisk command,

Example) 1. rescandisk



Weiver 2.0 Player / Operations Manual

 set current\_directory, get current\_directory command get file\_count, get filename, get folder\_count, get foldername command openfile, get openfile command

Example) 1. set current\_directory f:\ 2. get current\_directory 3. get file\_count 4. get filename 0 5. get filename 1 6. get folder\_count 7. get foldername 0 8. get foldername 1 9. openfile testrecordtest.wpj 10. get openfile

#### D:\Weiver\SW\EXE\WeiverPlayerRemoteAPI.exe

CMD>connect 50000 connect 50000 Received

CMD>rescandisk rescandisk Received

CMD>set current\_directory f:\ set current\_directory f:\ Received

CMD>get current\_directory get current\_directory f:₩

CMD>get file\_count get file\_count 2

CMD≻get filename Ø get filename Ø testrecordtest.wpj

CMD≻get filename 1 get filename 1 Trigger.wpj

CMD>get folder\_count get folder\_count 2

CMD≻get foldername Ø get foldername Ø WeiverData

CMD>get foldername 1 get foldername 1 x86

CMD≻openfile testrecordtest.wpj openfile testrecordtest.wpj Received

CMD≻get openfile get openfile testrecordtest.wpj

CMD>\_

Weiver 2.0 Player / Operations Manual

• play start, play stop, play pause, play resume, get play\_status command

Example) 1. play start

- 2. get play\_status
- 3. play pause
- 4. play resume
- 5. play stop

D:\Weiver\SW\EXE\WeiverPlayerRemoteAPl.exe

CMD>get foldername 1 get foldername 1 x86

CMD>openfile testrecordtest.wpj openfile testrecordtest.wpj Received

CMD≻get openfile get openfile testrecordtest.wpj

CMD>play start play start Received

CMD>get play\_status get play\_status play

CMD>play pause play pause Received

CMD>play resume play resume Received

CMD>play stop play stop Received

CMD>

WEIVER 2.0 Player / Operations Manual

### • set freq, get freq command

Example) 1. set freq 400000000 (400MHz setting)

2. get freq

- 3. set freq 400 MHz (400MHz setting)
- 4. set freq 400000 KHz (400MHz setting)
- 5. set freq 40000000 Hz (400MHz setting)

D:\Weiver\SW\EXE\WeiverPlayerRemoteAPI.exe

CMD>get freq get freq 400000000 (hz)

CMD>set freq 400000000 set freq 400000000 Received

CMD>set freq 400000000 hz set freq 400000000 hz Received

CMD>set freq 400.000 mhz set freq 400.000 mhz Received

CMD≻set freq 400000 khz set freq 400000 khz Received

CMD>get freq get freq 400000000 (hz)

CMD≻set freq 400.124 mhz set freq 400.124 mhz Received

CMD>get freq get freq 400124000 (hz)

### CMD>

WEIVER 2.0 Player / Operations Manual

• get gain\_min, get gain\_max, get rf\_out\_level 0, get gain, set gain command

Example) 1. get gain\_min 2. get gain\_max 3. get rf\_out\_level 0 4. set gain 100 5. get rf\_out\_level 0 6. get gain

D:\Weiver\SW\EXE\WeiverPlayerRemoteAPI.exe set freq 400.124 mhz Received CMD>get freq get freq 400124000 (hz) CMD>get gain\_min get gain\_min -300 (x 0.1dB) CMD>get gain\_max get gain\_max 300 (x 0.1dB) CMD>get rf\_out\_level 0 get rf\_out\_level 0 -448 (x 0.1dBm) CMD≻set gain 100 set gain 100 Received CMD>get rf\_out\_level 0 get rf\_out\_level 0 -348 (x 0.1dBm) CMD>get gain get gain 100 (x 0.1dB) CMD>\_

• get play\_time\_total, get play\_time\_current, set play\_time\_current, get play\_section, set play\_section command

```
Example) 1. get play_time_total
2. get play_time_current
3. set play_time_current 5
4. set play_section 6 10
5. get play_section
```

### D:\Weiver\SW\EXE\WeiverPlayerRemoteAPI.exe

```
CMD>get play_time_total
get play_time_total 125 (sec)
CMD>play start
play start Received
CMD>get play_time_current
get play_time_current 20 (sec)
CMD>set play_time_current 5
set play_time_current 5 Received
CMD>set play_section 6 10
set play_section 6 10 Received
CMD>get play_section
get play_section 6 10 (sec)
```

```
CMD>
```

CMD>

• set spec\_inv off/on, get spec\_inv command

Example) 1. set spec\_inv off 2. set spec\_inv on

D:\Weiver\SW\EXE\WeiverPlayerRemoteAPI.exe

```
CMD>set play_time_current 5
set play_time_current 5 Received
CMD>set play_section 6 10
set play_section 6 10 Received
CMD>get play_section
get play_section 6 10 (sec)
CMD>set spec_inv off
set spec_inv off Received
CMD>set spec_inv on
set spec_inv on Received
CMD>get spec_inv
get spec_inv on
```

WEIVER 2.0 Player / Operations Manual

• set sample\_rate, get sample\_rate command

Example) 1. set sample\_rate 12000000, set sample\_rate 12 mhz, set sample\_rate 12000 khz 2. get sample\_rate

D:\Weiver\SW\EXE\WeiverPlayerRemoteAPl.exe
CMD>set spec_inv off
set spec_inv off Received
CMD>set spec_inv on
set spec_inv on Received
CMD>get spec_inv
get spec_inv on
CMD>get sample_rate
get sample_rate 30000000 (hz)
CMD>set sample_rate 12 mhz
set sample_rate 12 mhz Received
CMD>get sample_rate
get sample_rate 12000000 (hz)
CMD>

• set trigger\_out\_level, get trigger\_out\_level command

Example) 1. set trigger\_out\_level low 2. set trigger\_out\_level high

D:\Weiver\SW\EXE\WeiverPlayerRemoteAPI.exe

```
CMD>get sample_rate
get sample_rate 30000000 (hz)
CMD>set sample_rate 12 mhz
set sample_rate 12 mhz Received
CMD>get sample_rate
get sample_rate 12000000 (hz)
CMD>set trigger_out_level low
set trigger_out_level low Received
CMD>set trigger_out_level high
set trigger_out_level high
Received
CMD>get trigger_out_level
get trigger_out_level
get trigger_out_level
```

Weiver 2.0 Player / Operations Manual

```
• set extclk, get extclk command
```

Example) 1. set extclk off 2. set extclk on 3. get extclk

CMD>set trigger\_out\_level low set trigger\_out\_level low Received CMD>set trigger\_out\_level high set trigger\_out\_level high Received CMD>get trigger\_out\_level get trigger\_out\_level get trigger\_out\_level high CMD>set extclk off set extclk off Received CMD>set extclk on set extclk on Received CMD>get extclk get extclk on

• set trigger\_in, get trigger\_in command

Example) 1. set trigger\_in off 2. set trigger\_in on 3. get trigger\_in

#### D:\Weiver\SW\EXE\WeiverPlayerRemoteAPI.exe

CMD≻set extclk off set extclk off Received

CMD≻set extclk on set extclk on Received

CMD>get extclk get extclk on

CMD>set trigger\_in off set trigger\_in off Received

CMD≻set trigger\_in on set trigger\_in on Received

CMD>get trigger\_in get trigger\_in on

```
CMD>
```



### 5.5 / WeiverPlayer Remote API source

```
CWinApp theApp;
using namespace std;
const unsigned short u2_WeiverPlayerPort = WEIVER_PLAYER_API_RX_PORT;
const unsigned short u2_RecvPortFromWeiverPlayer = 50000;
const char s1a_WeiverPlayerIP[] = "192.168.100.1";
//const char s1a_WeiverPlayerIP[] = "127.0.0.1";
//const char s1a_WeiverPlayerIP[] = "192.168.10.15";
int _tmain(int argc, TCHAR* argv[], TCHAR* envp[])
{
        int nRetCode = 0;
        if (!AfxWinInit(::GetModuleHandle(NULL), NULL, ::GetCommandLine(), 0))
        {
                 _tprintf(_T("AfxWinInit failed.\n"));
                 nRetCode = 1;
        }
        else
        {
                 wchar_t wCmdLine[1000];
                 wchar_t wSendCmd[1000];
                 WSADATA wsaData;
                 WSAStartup(MAKEWORD(2,2), &wsaData);
                 while(nRetCode == 0)
                 ł
                         memset(wCmdLine, 0, 1000);
                         memset(wSendCmd, 0, 1000);
                         wprintf(_T("\nCMD>"));
                         _getws_s(wCmdLine, 1000);
```

```
if(wcsncmp(wCmdLine, _T("exit"), wcslen(_T("exit"))) == 0)
                         {
                                 nRetCode = 1;
                         }
                         else
                         {
                                 SendToStringCMD((char*)wCmdLine, 2*wcslen(wCmdLine));
                         }
                         wprintf(_T("\n"));
                }
                 WSACleanup();
        }
        return nRetCode;
void SendToStringCMD(char *s1p_Data, unsigned int u4_Size)
        SOCKET h_Socket;
        SOCKADDR_IN Addr;
        int SentBytes;
        WvPlayerRemotePacket_t t_Packet;
        WvPlayerRemotePacket_tp tp_Packet;
        char *pSendData = (char *)&t_Packet;
        char message[2000];
        memset(message, 0, 2000);
```

int clntAddrSize = sizeof(Addr);

}

{



h\_Socket = socket(PF\_INET, SOCK\_DGRAM, IPPROTO\_UDP);

memset(&Addr, 0, sizeof(Addr)); Addr.sin\_family = AF\_INET; Addr.sin\_port = htons(u2\_RecvPortFromWeiverPlayer); Addr.sin\_addr.s\_addr = htonl(INADDR\_ANY);

struct timeval timeout; timeout.tv\_sec = 2;//2 seconds timeout.tv\_usec = 0; int optlen = sizeof(timeout);

```
setsockopt(h_Socket, SOL_SOCKET, SO_RCVTIMEO, (const char *)&timeout, optlen);
if(bind(h_Socket, (SOCKADDR*)&Addr, sizeof(Addr)) == SOCKET_ERROR)
```

wprintf(\_T("bind() Error"));
closesocket(h\_Socket);
return;

```
}
```

{

t\_Packet.u4\_ID = WEIVER\_PLAYER\_ID; t\_Packet.u4\_Reserved = WV\_PLAYER\_REMOTE\_CMD\_SET\_STRING; t\_Packet.u4\_DataSize = u4\_Size;

memset(t\_Packet.u1a\_Data, 0, 1000); memcpy(t\_Packet.u1a\_Data, s1p\_Data, u4\_Size);

memset(&Addr, 0, sizeof(Addr)); Addr.sin\_family = AF\_INET; Addr.sin\_port = htons(u2\_WeiverPlayerPort); Addr.sin\_addr.s\_addr = inet\_addr(s1a\_WeiverPlayerIP);

```
SentBytes = sendto(h_Socket
                                  ,pSendData
                                  ,4/*sizeof(t_Packet.u4_ID)*/
                                  + 4/*sizeof(t_Packet.u4_Reserved)*/
                                  + 4/*sizeof(t_Packet.u4_DataSize)*/ + u4_Size
                                  ,0, (SOCKADDR*)&Addr, sizeof(SOCKADDR_IN));
        if(SentBytes == SOCKET_ERROR)
        {
                 wprintf(_T("\nSend Fail"));
        }
        else
        {
                 memset(&Addr, 0, sizeof(Addr));
                 int length = recvfrom(h_Socket
, message, 2000, 0, (SOCKADDR*)&Addr, &cIntAddrSize);
                 if(length == -1)
                 {
                          wprintf(_T("Time Out"));
                 }
                 else
                 {
                          tp_Packet = (WvPlayerRemotePacket_tp)(message);
                          wprintf(_T("%s"), tp_Packet->u1a_Data);
                }
        }
        closesocket(h_Socket);
```

}



# Appendix. A

A-1. Recorded Output File [FileName.iqw, FileName.log]

## • FileName.iqw

	Data	Point	Data I	Point	Data	Point	Data F	oint	Data P	Point
		<u> </u>								
Hex	ff ff C	06 00	00 00	fd ff	03 00	00 00	02 00	0c 00	fb ff 0	04 00
	$ \  \  \  \  \  \  \  \  \  \  \  \  \ $		$ \  \  \  \  \  \  \  \  \  \  \  \  \ $	$\Box$	$\Box$	${}^{\Box}\!$	$\Box$	$\square$	$\sqsubseteq \!$	${ } { \ } { } { \ } { } { } { } { } { } $
Decimal	I Data -1	Q Data 6	I Data 0	Q Data -3	I Data 3	Q Data 0	I Data 2	Q Data 12	I Data -5	Q Data 4

## • FileName.wpj

Line 1: \$Ver,1,IQ FileName,Cap\_20110510\_090927.iqw,IQ Rate,30000000,Center,474000000,Tracking, 1,AGC,0 Line 2: \$GAIN,22.3,POWER,-42.1,,,TIME,1 Line 3: \$GPRMC,214614.036,V,,,,,0.00,0.00,060180,,,N\*43 Line 4: \$GAIN,22.3,POWER,-42.1,,,TIME,2 Line 5: \$GPRMC,214615.036,V,,,,,0.00,0.00,060180,,,N\*42

Line 1: File Info. Ver: 1 IQ FileName:Cap\_20110510\_090927.iqw IQ Rate:3000000(30MHz : BW 24M) Center:474000000(474MHz) Tracking:1(0:Disable, 1:Enable) AGC:0(0:Off, 1:On)

Line 2: Gain Info. Ling 3: GPS Info.

Line 1: \$Ver,1,IQ FileName,Cap\_20110510\_090924.iqw,IQ Rate,10000000,Center,474000000,Tracking, 1,AGC,0

Line 2: \$GAIN,22.3,POWER,-52.2,,,TIME,1

Line 3: \$GPRMC,214605.036,V,,,,,0.00,0.00,060180,,,N\*43

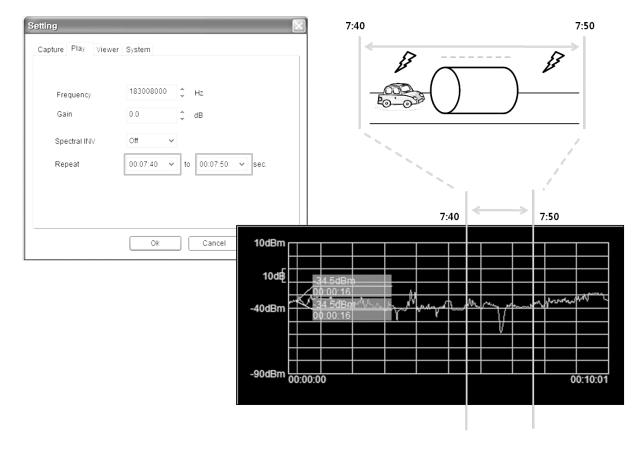
Line 4: \$GAIN,22.3,POWER,-52.2,,,TIME,2 Line 5: \$GPRMC,214606.036,V,,,,,0.00,0.00,060180,,,N\*40

... Line 1: File Info. Ver: 1 IQ FileName: Cap\_20110510\_090924.iqw IQ Rate:1000000(10MHz : BW 8M) Center:474000000(474MHz) Tracking:1(0:Disable, 1:Enable) AGC:0(0:Off, 1:On) Line 2: Gain Info.

Ling 3: GPS Info.



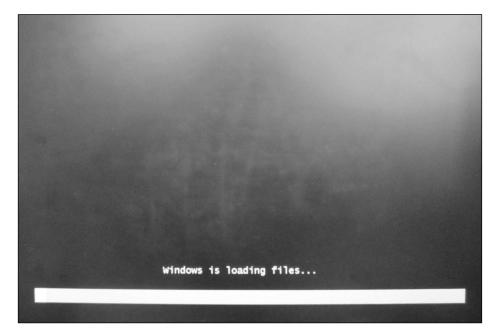
# A-2. Configurable Repeat Play



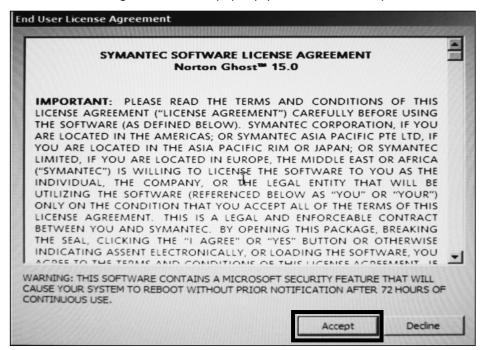


# Appendix. B Ghost 15.0 Restoration

- Please insert the USB Recovery Disk into USB port of WEIVER 2.0 Player system. Before the Recovery process, WEIVER 2.0 Player system must be set to use Boot from USB CD-ROM at BIOS configuration.



- Once the License Agreement screen pops up, please click the Accept button.





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- Please click the Recover My Computer button on Home tap

	Welcome to the Symantec Recovery Disk
lome	When you can no longer start Windows, you can recover your computer from here, provided that you have a recovery point that is accessible, such as on a working hard disk drive, or on a network drive.
ecover	
nalyze	Recover My Computer Recover my computer to a specific time and day when it was working correctly.
letwork	Back Up My Computer Back up one or more drives from my computer.
	Help Open the Symantec Recovery Disk help system
tilities	

- Please click the Next button.





# - Please click the OK button.

Recover My Computer Wiz	zard	
E	Welcome to the Recover My Computer Wizard	
	Use this wizard to recover your system drive, the drive where your operating system is installed (typically, drive C). Or use it to recover a secondary drive, which is any drive othe than the system drive.	r
Recover	My Computer Wizard vailable. Be ry point was	
0	No recovery points were automatically detected for this computer. Click OK to browse to a location that contains recovery points.	
	Onvenetiers onder the symantee the covery bisk might not match those in the	
	Windows environment.	
3 symantec.	To continue, click Next	
	< Back Next > Cancel Help	,

## - Please click the Browse button.

Recover My Computer Wizard			2
Select a Recovery Point to Restore Select a recovery point that you want to restore.			lè
View recovery points by:			
Recovery point folder and filename:			Map a network drive Browse
Recovery point details:			-
			-1
	< Back	Next>	Cancel Help

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🛞 Recover My Comput	er Wizard					X
Select a Recovery F	oint to Restor	9				
Vie Fik Rer Recent Places Desktop SYSTEM SYSTEM Computer	CD Drive ( Name A AUTORUN DOCS EFI MANAGER SUPPORT WEIVER_C.	Date 🗐 🕇 Type	V Size BOOT DRIVER VALI SOURCES UPDATELOCA			itve 
	File name: Files of type:	WEIVER_C.V2I Recovery Points	(*.v2),*.iv2),*.pqi)	-	Ope	
	10 september		< Back	lext>	Cancel	Help

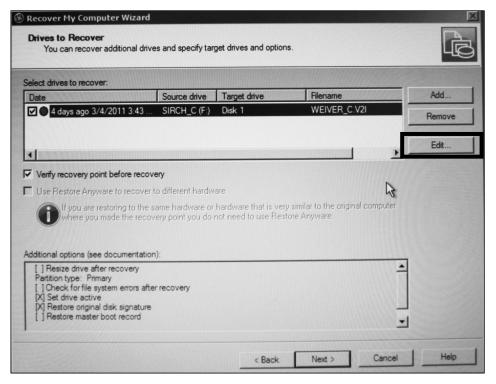
- Please select the Weiver\_Player\_C.V2I file in CD(USB-CD) Drive

- Please click the Next button.

lecover My Computer Wizard	ALALIA CONTRACTOR			
You can recover additional drive	es and specify tar	get drives and optior	15.	
lect drives to recover:				
Date	Source drive	Target drive	Filename	Add
4 days ago 3/4/2011 3:43	SIRCH_C (F:)	Disk 1	WEIVER_C.V2I	Remove
				Edit
				-
Verify recovery point before recov	ery			
Use Restore Anyware to recover	o different hardw	are		3
If you are restoring to the s where you made the recov	ame hardware or ery point you do	hardware that is ver not need to use Res	y similar to the original comput tore Anyware.	ler
Iditional options (see documentation	ı):			
[ ] Resize drive after recovery Partition type: Primary [ ] Check for file system errors afte [X] Set drive active [X] Restore original disk signature [ ] Restore master boot record	r recovery			
		< Back	Next > Can	cel Help



### - Please click the Edit button.



### - Please select target to C drive

Edit Tar	get Drive and Opti	ons					
Date Drive Size:	to recover: 4 days ago 3/4/201: SIRCH_C (F:) 18.6 GB a target drive or unal						
Disk	Volume Label	Size	File System	Туре	Source	drive	Delete Drive
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	SIRCH_C SIRCH_D size drive after recov. Size 19076	18.6 GB 192 KB 18.6 GB 4.46 MB	Unallocated	Primary Primary Primary Primary Primary	SIRCH.	<u>c (F;)</u>	Undo Delete
6	on type: Primary partition Cogical partition						
א בין א בין ג	heck for file system en et drive active (for boo estore original disk sig lestore master boot re	oting OS) nature	very				
					ок	Cancel	Help



- Please click the Next button.

ecover My Computer Wizard				
You can recover additional driv	es and specify tar	get drives and optior	15.	L
lect drives to recover:				
Date	Source drive	Target drive	Filename	Add
4 days ago 3/4/2011 3:43	SIRCH_C (F:)	Disk 1	WEIVER_C.V2I	Remove
1				Edit
Verify recovery point before recov	very			
Use Restore Anyware to recover	to different hardw	are		
If you are restoring to the where you made the reco			v similar to the original comput ore Anyware.	ter
dditional options (see documentatio	n):			_
[] Resize drive after recovery Partition type: Primary [] Check for file system errors after [X] Set drive active				-
[X] Restore original disk signature				
[X] Restore original disk signature [X] Restore master boot record				-

- Please click the Finish button.

🛞 Recover My Computer W	izard D
2J	Completing the Recover My Computer Wizard
	Source recovery point: E:\WEIVER_C.V2I Created: 3/4/2011 3:43 PM Split across multiple files: No Computer name: kycpc Restore Anyware: Not permitted Drive: SIRCH_C (F:) Size: 18.6 GB File system: NTFS
	Recovery point description: None
V -	Target drive: Disk 1 Drive: Size: 18.6 GB
200	Options: [X] Verify recovery point before recovery
	Additional options: [] Resize drive after recovery Partition type: Primary [] Check for file system errors after recovery
	Reboot when finished
S symantec.	To begin recovery, click Finish.
	< Back Finish Cancel Help



- When you click the Yes button, recovery process will be start.

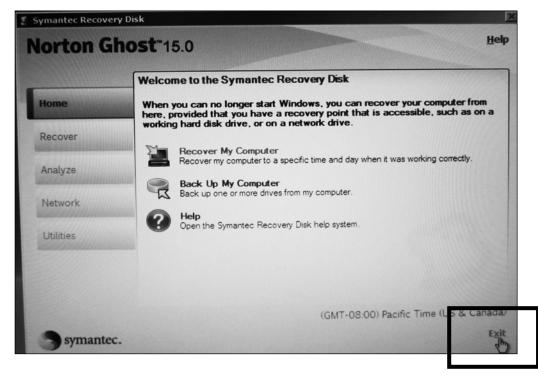
2D	Completing the Recover My Computer Wizard	
	Source recovery point: E:\WEIVER_C.V2I Created: 3/4/2011 3:43 PM Split across multiple files: No Computer name: kycpc Restore Anyware: Not permitted Drive: SIRCH C (F:)	4
Recover	r My Computer Wizard	
Â	You will lose all changes that have been made to the drive since the recovery point was created. Your current data will be overwritten with the data in the recovery point.	
	Do you want to continue and start the recovery?	
	Yes No Partition type: Primary	
	[] Check for file system errors after recovery	-1
	Reboot when finished	
symantec.	To begin recovery, click Finish.	
	< Back   Finish,   Cancel   +	Help
Recover My Computer Wi		
	Completing the Recover My Computer Wizard	
Ð	Source recovery point: E:\WEIVER_C.V2I	
	Source recovery point: E:\WEIVER_C.V2I Created: 3/4/2011 3:43 PM Split across multiple files: No Computer name: kycpc Restore Annware: Not comitted	2
Recover	Source recovery point: E:\WEIVER_C.V2I Created: 3/4/2011 3:43 PM Split across multiple files: No Computer name: kycpc	4
10	Source recovery point: E:\WEIVER_C.V2I Created: 3/4/2011 3:43 PM Split across multiple files: No Computer name: kycpc Restore Annware: Not comitted	
Calculat Recover Analyzir Enumera	Source recovery point: E:\WEIVER_C.V2I Created: 3/4/2011 3:43 PM Split across multiple files: No Computer name: kycpc Restore Annuare: Not nomitted r My Computer Wizard - Progress (0%)	A
Calculat Recover Analyzir Enumera	Source recovery point: E:\WEIVER_C.V2/ Created: 3/4/2011 3:43 PM Split across multiple files: No Computer name: kycpc Restore Annuare: Not normitted r My Computer Wizard - Progress (0%) Into 101010101010101111	1
Calculat Recover Analyzir Enumera	Source recovery point: E:\WEIVER_C.V2/ Created: 3/4/2011 3:43 PM Split across multiple files: No Computer name: kycpc Restore Answare: Not nemitted <b>My Computer Wizard - Progress (0%)</b> inter the storage management stack ating the storage management stack ating devices ing kernel symbolic links	*
Calculat Recover Analyzir Enumera	Source recovery point: E:\WEIVER_C.V2I Created: 3/4/2011 3:43 PM Split across multiple files: No Computer name: kycpc Pactore Annuare: Not namitted <b>My Computer Wizard - Progress (0%)</b> international for the storage management stack ating time remaining r: E:\WEIVER_C.V2I ng the storage management stack ating devices ng kernel symbolic links Cancel	

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- When recovery process finished, please click the Close button.

Recover My Computer Wiz	zard	L. L.
20	Completing the Recover My Computer Wizard	
	Source recovery point: E:\WEIVER_C.V2I Created: 3/4/2011 3:43 PM Split across multiple files: No Computer name: kycpc Bactora Annumae: Not committed	-
Recover	My Computer Wizard - Progress	
Recover	ry complete: 00:02:38	
	Close	
	[] Check for file system errors after recovery	-
	Reboot when finished	
Symantec.	To begin recovery, click Finish.	
	< Back Finish Cancel	lelp

### - Please click the Exit button.





Symantec Recovery	Disk
Norton Gh	OSt <sup>*</sup> 15.0
	Welcome to the Symantec Recovery Disk
Home	When you can no longer start Windows, you can recover your computer from here, provided that you have a recovery point that is accessible, such as on a working hard disk drive, or on a network drive.
Recover	mantec Recovery Disk
Analyze	ng correctly.
Network	
Utilities	Yes No
	(GMT-08:00) Pacific Time (US & Canada)
Symantec.	Exit

- Please click the Yes button. After this process, WEIVER 2.0 Player system must be reboot.



# Appendix. C

C-1. Remote Desktop Connection method

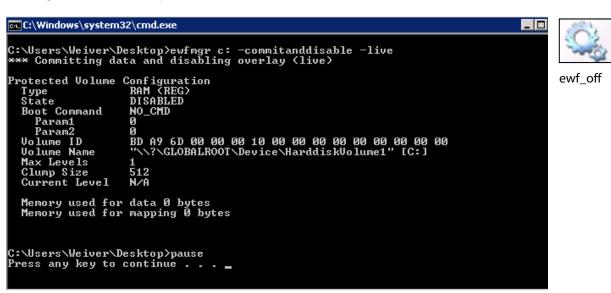
Factory Default Value for Remote Desktop Connection (ID: Weiver / Password: Lumantek) \* Case Sensitive

Windows XP OS	Remote Desktop Connection
Start > Programs-> Accessories-> communications	Remote Desktop Connection
->Remote Desktop Connection	Computer: IP Address
	Connect Cancel Help Options >>
Windows 7 OS	Remote Desktop Connection
Start > All Programs-> Accessories	
->Remote Desktop Connection	Computer: IP Address
	User name: None specified
Start Start	The computer name field is blank. Enter a full remote computer name.
	<u>O</u> ptions     Connect     Help

C-2. Weiver EWF (Enhanced Write Filter) Control[Disable/Enable/State]

Please run ewf\_off file on Weiver's desktop for the EWF disablement.

\* Note : Before the WEIVER 2.0 Player installation or upgrade, EWF must be a disable state. Also, EWF Function must be Working on Weiver's desktop screen



After the WEIVER 2.0 Player Installation or Upgrade, Please run ewf\_on file on Weiver's desktop for the EWF enablement.

Please reboot the Weiver's system for applying EWF enablement.

📾 C:\Windows\system32\cmd.exe	
C:\Users\Weiver\Desktop>ewfmgr c: -enable *** Enabling overlay	
Protected Volume Configuration Type RAM (REG) State DISABLED Boot Command ENABLE Param1 0 Param2 0 Volume ID BD A9 6D 00 00 10 00 00 00 00 00 00 00 00 Volume Name "\\?\GLOBALROOT\Device\HarddiskVolume1" [C:] Max Levels 1 Clump Size 512 Current Level N/A	ewf_on
Memory used for data 0 bytes Memory used for mapping 0 bytes	
Please reboot!!!	
C:\Users\Weiver\Desktop>pause Press any key to continue	

Please run ewf\_state file on Weiver's desktop for the EWF state.

State EN Boot Command NO Param1 Ø Param2 Ø Volume ID BD	top>ewfmgr c: figuration M (REG) ABLED _CMD A9 6D 00 00 00 10 00 00 00 00 00 00 00 00 00 \?\GLOBALROOT\Device\HarddiskVolume1" [C:] 2 ta 28328448 bytes	ewf_state
C:\Users\Weiver\Desk Press any key to con		

END



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