

# MP5010

Smartphone Connectivity Test Station

PRODUCT BROCHURE

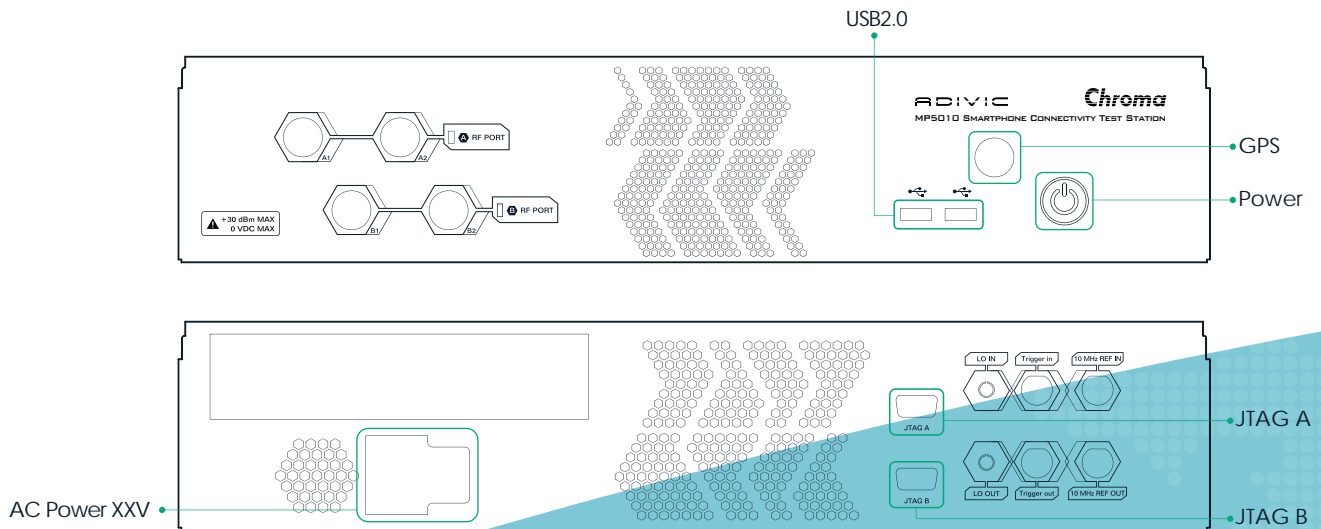
**ADIVIC**  
— RF TEST & MEASUREMENT —

# MP5010

Smartphone Connectivity Test Station

## Features

1. Software Defined Radio(SDR) architecture with VSG/VSA in one box
2. Support 802.11ac, 802.11a/b/g/n standards
3. Support Bluetooth V1.x/V2.x/V3.x EDR/V4.x BLE
4. Support up to 8 channel GPS simulator
5. Signal measurement engine in box
6. User friendly GUI for R&D/QA applications
7. API for production automation programming
8. Turn-key production automation software support upon request



**Mechanical**  
 Dimensions : L:480mm X W:425mm X H:89mm  
 Weight : 12Kg

# MP5010 General Technical Specifications

## >> RF Analyzer

Parameter	Specifications
Input Frequency Range	2150~2600 MHz, 4900~6000 MHz optional 300KHz~6GHz full band
RF Port number	2 Ports
IF bandwidth	120 MHz
Max input power	+30 dBm peak, +20 dBm average
Input power accuracy @(+20 to -75 dBm)	+/-0.75 dB (+/-0.5 dB Typ) +/-1.0 dB @ 0 °C ~ 50°C
Phase Noise	Phase noise < -100dBc: 1 KHz offset @2.4 GHz Phase noise < -95dBc: 1 KHz offset @5.8 GHz
LO Leakage (after self-calibration)	< -50 dBc
sideband image (IQ-imbalance) @after self-calibration	<-50dBc @ 2.4GHz, -10dBm <-50dBc @ 5.8GHz, -10dBm
Third order input inter-modulation distortion(IMD3)	< -70dBc@-10 dBm
Input Return loss	> 10 dB 2150~2600 MHz > 12 dB 4900~6000 MHz
ADC resolution	16 Bits
Sample rate	160 MS/s
Initial achievable accuracy	+/-50 ppb maximum (OCXO) @25 °C, after 60 minutes warm up
Temperature stability	+/-20 ppb maximum(OCXO) @0 °C ~50 °C
Aging	+/-1 ppb / day maximum (OCXO) +/-100 ppb / yr maximum (OCXO)
Operating Temperature	0 °C to 50 °C
Operating Voltage	100 V to 240 V
Warm-up time	> 30 minute

## >> RF Generator

Parameter	Specifications
Output Frequency Range	4900~6000 MHz, 2150~2600 MHz optional 300KHz~6GHz full band
IF bandwidth	120 MHz
Max Output power@ CW	+10 dBm @ 2150~2600 MHz +7 dBm @ 4900 ~ 6000 MHz
Power Accuracy@(0 to -95 dBm)	+/-0.75 dB (+/-0.5 dB Typ) +/-1.0 dB @ 0 °C ~ 50 °C
Phase Noise	Phase noise < -100 dBc: 1 KHz offset @ 2.4 GHz Phase noise < -95 dBc: 1 KHz offset @ 5.8 GHz
LO leakage(DC offset) @after self-calibration	< -50 dBc @ 2.4 GHz, -10 dBm < -50 dBc @ 5.8 GHz, -10 dBm
sideband image (IQ-imbalance) @after self-calibration	< -50 dBc @ 2.4 GHz, -10 dBm < -50 dBc @ 5.8 GHz, -10 dBm
Third order inter -modulation distortion(IMD3)	<-60dBc@-10dBm(two -13dBm Tone)
Return loss	> 10 dB 2150 ~ 2600 MHz > 12 dB 4900 ~ 6000 MHz
DAC resolution	16 Bits
Sample rate	960 MS/s
Initial achievable accuracy	+/- 50 ppb maximum (OCXO) @ 25 °C, after 60 minutes warm up
Temperature stability	+/- 20 ppb maximum (OCXO) @ 0 °C ~ 50 °C
Aging	+/-1 ppb / day maximum (OCXO) +/-100 ppb / yr maximum (OCXO)
Operating Temperature	0 °C to 50 °C
Operating Voltage	100 V to 240 V
Warm-up time	> 30 minute

\* Test condition Temperature : 15 °C ~ 35°C  
Voltage : 100 V to 240 V

Frequency Characteristics		RF Output Characteristics		Overload protection on RF output	
Frequency Range	1575.42 MHz	Normal output level	-90 dBm to -160 dBm	Maximum reverse RF power	1 Watt maximum
Warm-up time (typical)	30 minutes	Channel Attenuation range	-31.5 dB to 0 dB (refer to normal output level)	Maximum DC input	± 25 VDC
Frequency Accuracy	± 100 ppb maximum			<b>Calibration</b>	
Temperature stability	± 100 ppb maximum	Power level range	-90 dBm to -145 dBm in 1 dB step, -145 dBm to -160 dBm in 0.5 dB step.	Calibration	1 year
Aging (Per year)	± 100 ppb maximum			<b>Environmental</b>	
Aging (Per day)	± 1 ppb maximum			Operating temperature	0 to 50 °C
<b>Channels</b>		Amplitude Resolution	1 dB step	Relative Humidity	10 % to 90 %
Number	1CH, Opt : 8CH	Amplitude Accuracy	< ±1 dB	Storage temperature	-20 to 70 °C
Navigation data	GPS C/A @ 1.023 MHz with 50 bps	Output Impedance	50 Ω	Relative Humidity	5 % to 95 %
Modulation	BPSK	Doppler Shift	± 30 KHz (1 CH option)		
<b>Spectral purity</b>		<b>Voltage Standing Wave Ratio</b>			
Phase Noise @ 1 KHz offset	< -80 dBc/Hz	1575.42 MHz	< 1.2		
Harmonic	< -70 dBc				

# MP5010

Smartphone Connectivity Test Station

The MP5010 deploys state-of-the-art Software Defined Radio (SDR) architecture that consists of full extendibility to all current and future Wifi / Bluetooth/GPS standards. By upgrading firmware and hardware, it will be capable to support LTE and other wireless standards in the future.

The MP5010 contains high quality VSA (Vector Signal Analyzer) & VSG (Vector Signal Generator) to provide a complete and versatile test environment. A highly integrated GUI is both intuitive and user-friendly which can run simple test of wi-fi/ Bluetooth/GPS signal within few clicks. Supported measurement items include EVM, power, frequency error, IQ imbalance, 20dB Bandwidth, FM Demodulator Output, etc.

The MP5010 comes fully programmed test waveforms for wi-fi 802.11a/b/g/n/ac & Bluetooth V.1.x/2.x/3.x EDR/4.x BLE & 8 channel GPS simulator which allows immediate testing for DUTs. Moreover, a built-in waveform generator utility let users being to establish arbitrary Wi-Fi/Bluetooth testing signals& Set GPS signal location point arbitrarily. Automatic mass production turnkey software is also available upon request.

The MP5010 support up to 8 channel GPS simulator and allow to create arbitrary GPS location signal. Furthermore, it provides adjustable output power level for each every satellite.



# MP5010

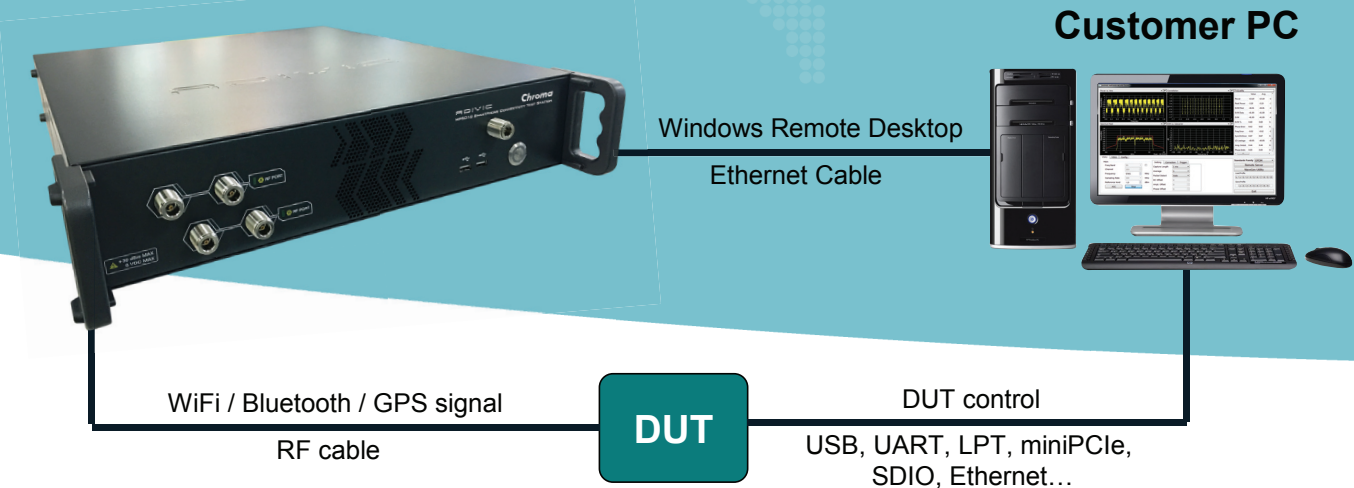
Smartphone Connectivity Test Station



# MP5010 R&D / QA Graphic Program

## MP5010 Full Test Setup for R&D/QA

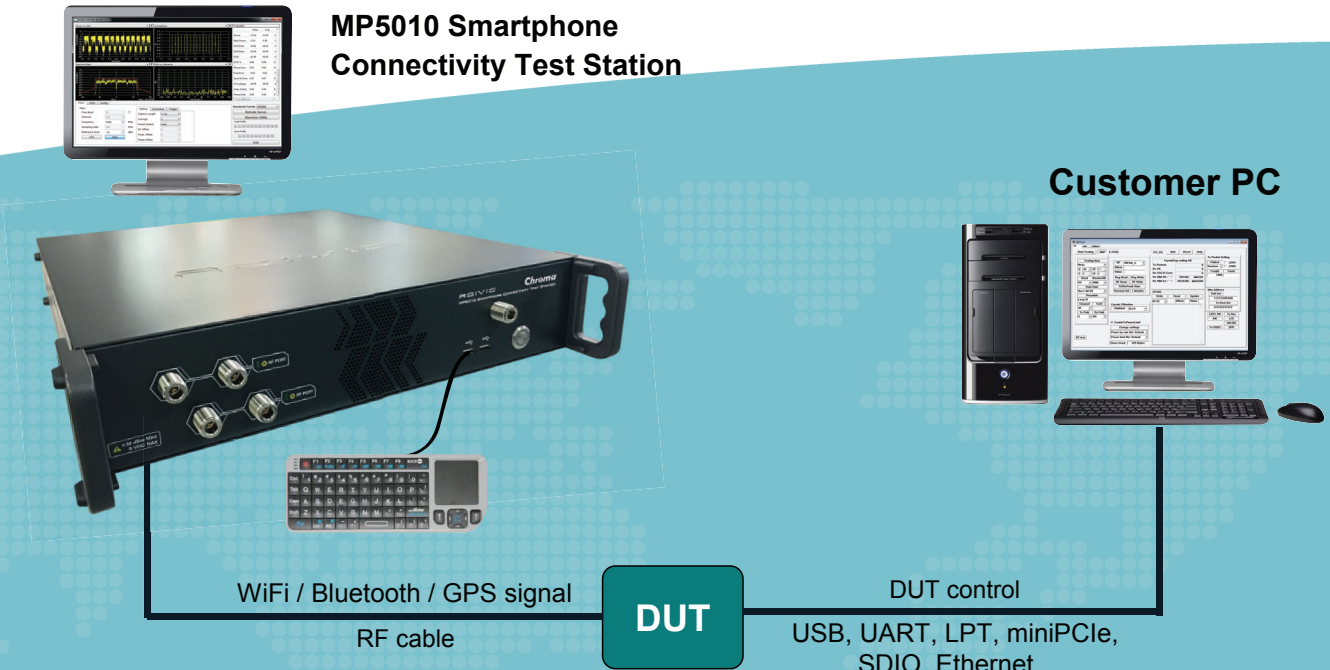
### MP5010 Smartphone Connectivity Test Station



GUI application runs on the MP5010 Tester  
 Manage the GUI application thru Windows Remote Desktop  
 No need to install additional software package into your PC/NB

## MP5010 Simple Test Setup for R&D/QA

### MP5010 Smartphone Connectivity Test Station

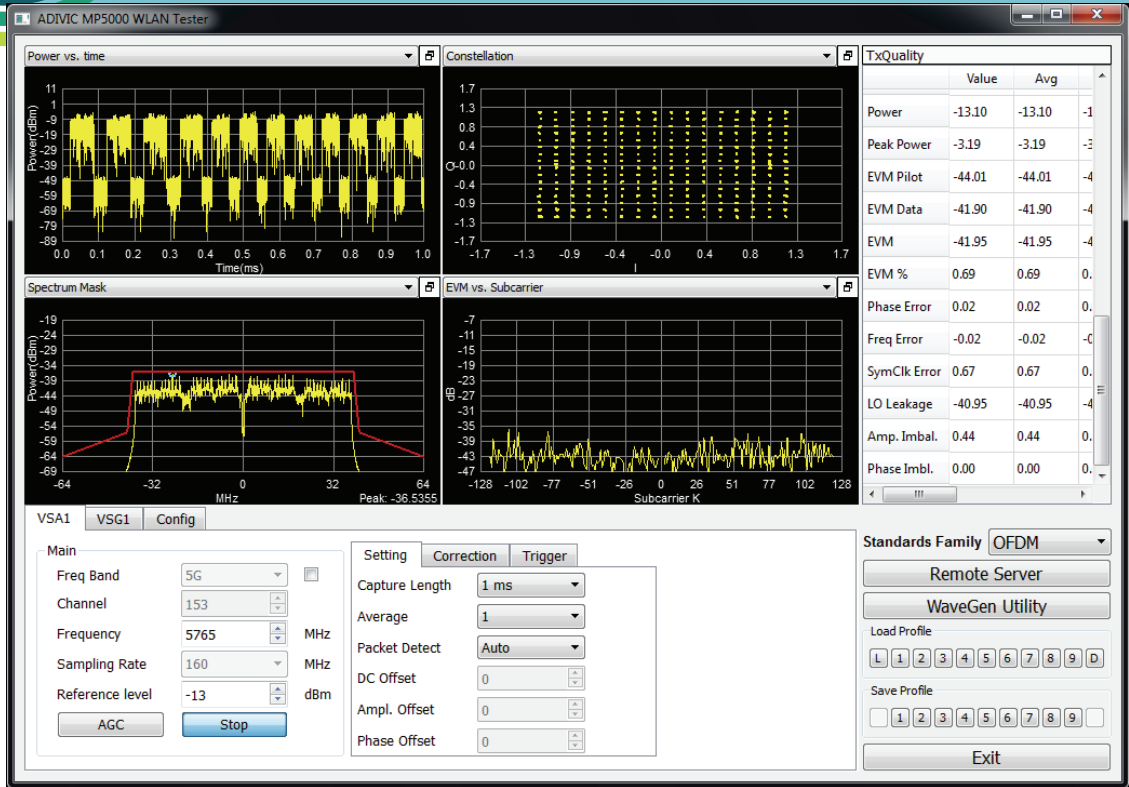


GUI application runs on the MP5010 Tester  
 Manage MP5010 as a PC

# MP5010

Smartphone Connectivity Test Station

## MP5010 GUI Outlook (Wi-Fi)

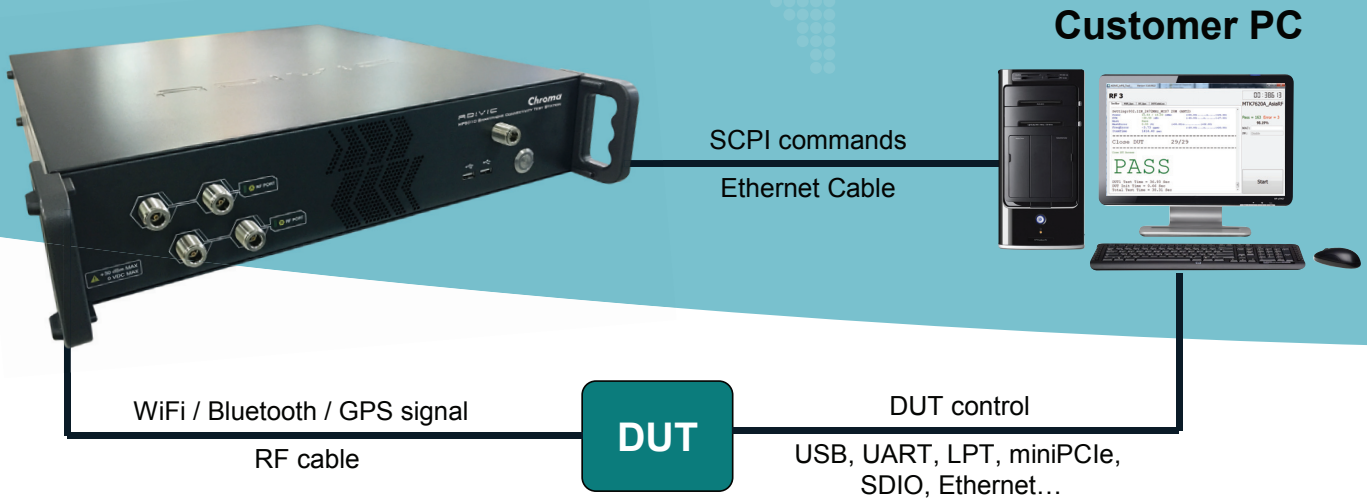


## MP5010 GUI Outlook (Bluetooth)



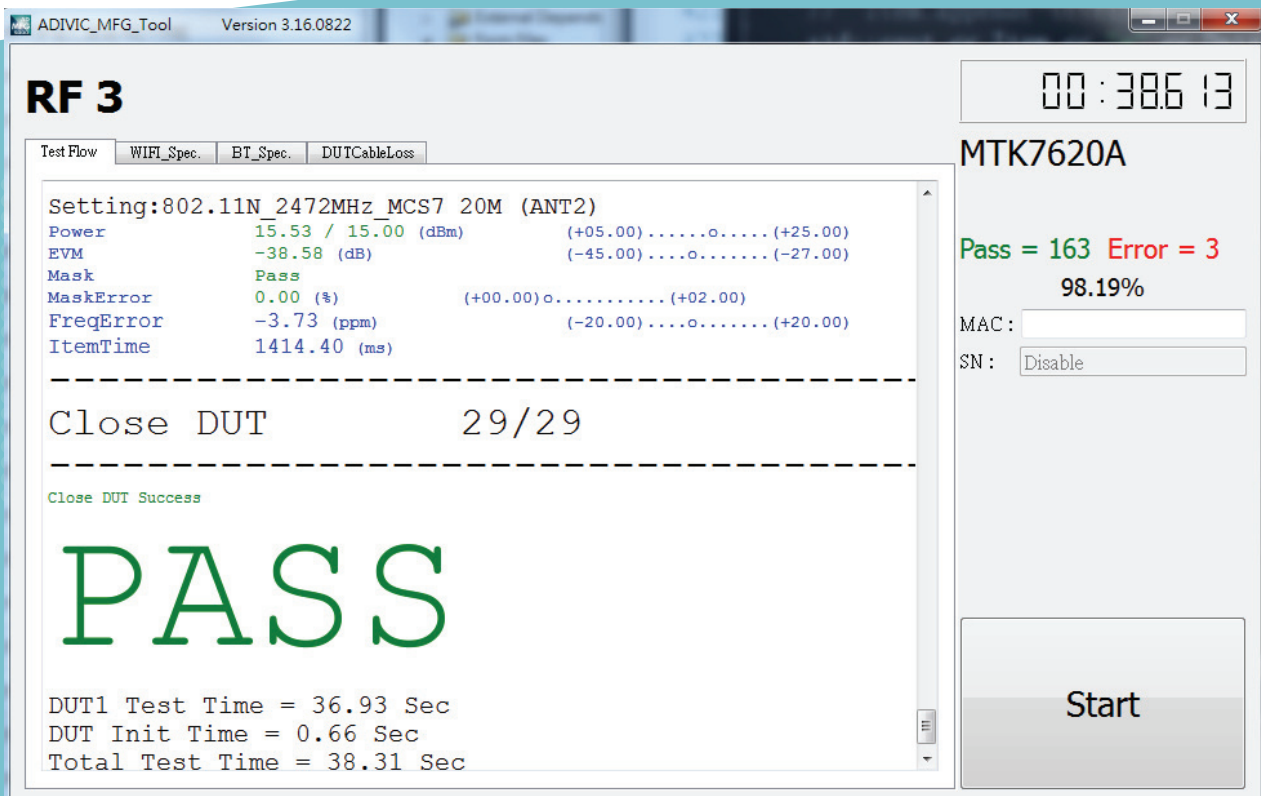
## MP5010 Automated Test Setup for Mass-Production

### MP5010 Smartphone Connectivity Test Station



VSA/VSG engines run on the MP5010 Tester  
Mass-production software runs on the customer's PC

## MP5010 Automated Mass-Production Turnkey Software



ADIVIC\_MFG\_Tool Version 3.16.0822

**RF 3**

Test Flow: WIFI\_Spec. | BT\_Spec. | DUTCableLoss

Setting: 802.11N\_2472MHz\_MCS7 20M (ANT2)

Power	15.53 / 15.00 (dBm)	(+05.00).....o.....(+25.00)
EVM	-38.58 (dB)	(-45.00).....o.....(-27.00)
Mask	Pass	
MaskError	0.00 (%)	(+00.00)o.....(+02.00)
FreqError	-3.73 (ppm)	(-20.00).....o.....(+20.00)
ItemTime	1414.40 (ms)	

Close DUT 29/29

Close DUT Success

**PASS**

DUT1 Test Time = 36.93 Sec  
DUT Init Time = 0.66 Sec  
Total Test Time = 38.31 Sec

00:38:613

MTK7620A

Pass = 163 Error = 3  
98.19%

MAC:

SN:

Start



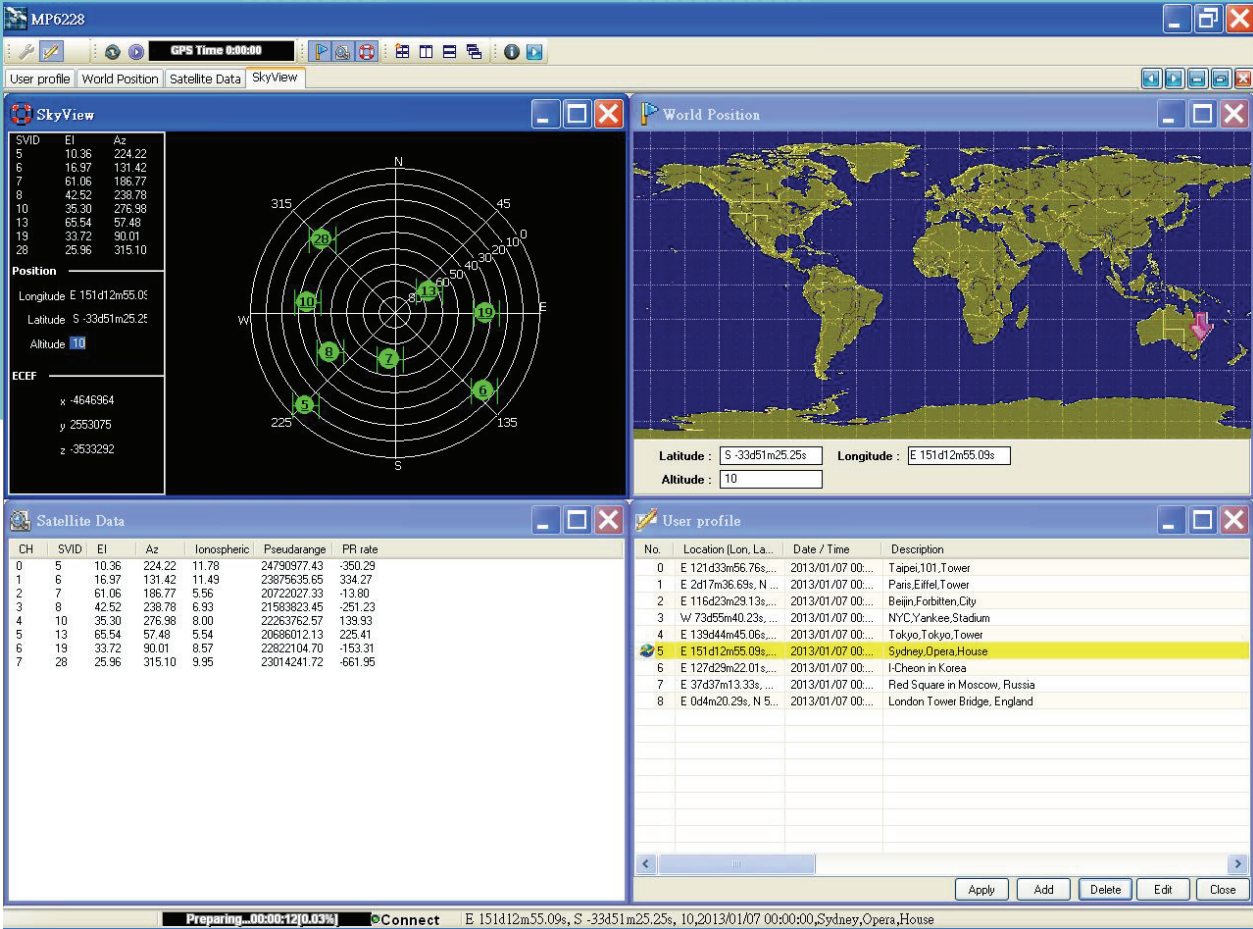
**MP5010 GUI Outlook(GPS), 1CH**

A screenshot of the MP5010 GUI interface. The window title bar reads 'MP6221 (AP: 1.5.3 Middle FW: V2.0.1.0 Bottom FW: 2.2.2.1)'. The interface is organized into several sections, each with a label on the left and control elements on the right:

- Space Vehicles (SV):** A dropdown menu showing the number '6'.
- Power Path:** Two radio buttons, 'Low' (selected) and 'High'.
- RF Power Level (dBm):** A range from -160 to -90 with a slider and a numeric input field set to -90.
- Doppler Shift (Hz):** A range from -30K to 30K with a slider and a numeric input field set to 0.
- Navigation Data:** Two radio buttons, 'Nav Data' and '0101' (selected).
- RF Signal Mode:** Three radio buttons, 'OFF' (selected), 'ON', and 'CW'.



## MP5010 GUI Outlook(GPS), Opt : 8CH



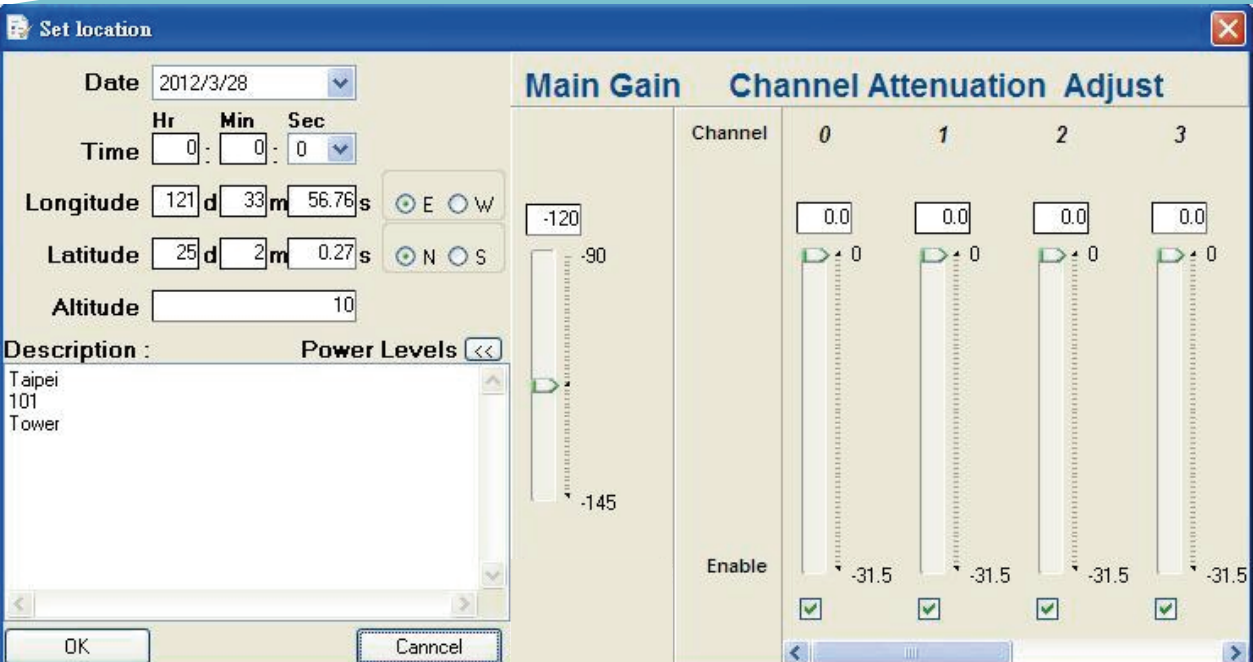
The screenshot displays the MP5010 GUI with the following panels:

- SkyView:** Shows a circular constellation diagram with 10 satellites (numbered 1-10) and their positions relative to the Earth's horizon. It also lists SVID, EI, and Az values for each satellite.
- World Position:** A world map showing the current location. Latitude: S -33d51m25.25s, Longitude: E 151d12m55.09s, Altitude: 10.
- Satellite Data:** A table listing satellite parameters:

CH	SVID	EI	Az	Ionospheric	Pseudorange	PR rate
0	5	10.36	224.22	11.78	24790377.43	-350.29
1	6	16.97	131.42	11.49	23879635.65	334.27
2	7	61.06	186.77	5.56	20722027.33	-13.80
3	8	42.52	238.78	6.93	21583823.45	-251.23
4	10	35.30	276.98	8.00	22263762.57	139.93
5	13	65.54	57.48	5.54	20686012.13	225.41
6	19	33.72	90.01	8.57	22822104.70	-153.31
7	28	25.96	315.10	9.95	23014241.72	-661.95

- User profile:** A list of saved locations with columns for No., Location (Lon, La...), Date / Time, and Description. The selected location is Sydney, Opera House.

## Arbitrary GPS Location Setting, Opt : 8CH



The 'Set location' dialog box includes the following fields and controls:

- Date:** 2012/3/28
- Time:** Hr: 0, Min: 0, Sec: 0
- Longitude:** 121 d 33 m 56.76 s (E/W)
- Latitude:** 25 d 2 m 0.27 s (N/S)
- Altitude:** 10
- Description:** Taipei 101 Tower
- Power Levels:** <<<
- Main Gain:** -120
- Channel Attenuation Adjust:** Four channels (0-3) with sliders and checkboxes. Channel 0 is set to 0.0 dB and is enabled. Channels 1-3 are set to -31.5 dB and are also enabled.

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