



Train crossings long-distance range MIMO WiFi wireless monitoring plan proposal

with Solar DC UPS power system and 12VDC to 48VDC PoE Converter & 12VDC to 24VAC Power Inverter

1. Plan goal

Passes by various level crossings in view of the train the general risk, proposed that setups digital surveillance cameras in various level crossings, by the long-distance range wireless diving platform transmission, digital surveillance cameras pictures and t data control system, was transmitted to the train station crossings control center to upgrade the railway crossings safety supervision and safety protection, reduction of train and passenger and road vehicle accident and plane of Minotaur. If might the conformity monitoring equipment's automatic obstacle detection function, be able again the reinforcement in anticipation the caution safety system benefit.

2. Plan demand

In various level crossings stockade and the access, erect digital surveillance cameras, collects in network switchboard (Switch) through MIMO the WiFi wireless base station, monitored video image data in a continuous relay platform transmission mode (Multiple Hops), crossings and control center back to the railway station.

Digital camera → switch → MIMO WiFi wireless base stations → relay platform transfer-Multiple hops (MIMO WiFi wireless base stations) → railway crossings and control center

If the wireless surveillance system setup WiFi MIMO Mesh Hi-mobile features, the engine cockpit driver can real time to see the train crossing have jam accident in 5~10Km distance and try to start the stop train step by step.

When the system have design the auto alarm monitoring system, the driver will easy to auto get the special real time trains crossing jam situation alarm information via wireless data transmit.



3. Plans the region

This plan document simulation about the both sides four corners level crossing as plans the region take 'the Hsinchu train station' is an example, proposes of supervisory system plan document the diving platform type long-distance range wireless transmission. Detailed plan region, please see the following figure.

4. Plan proposal

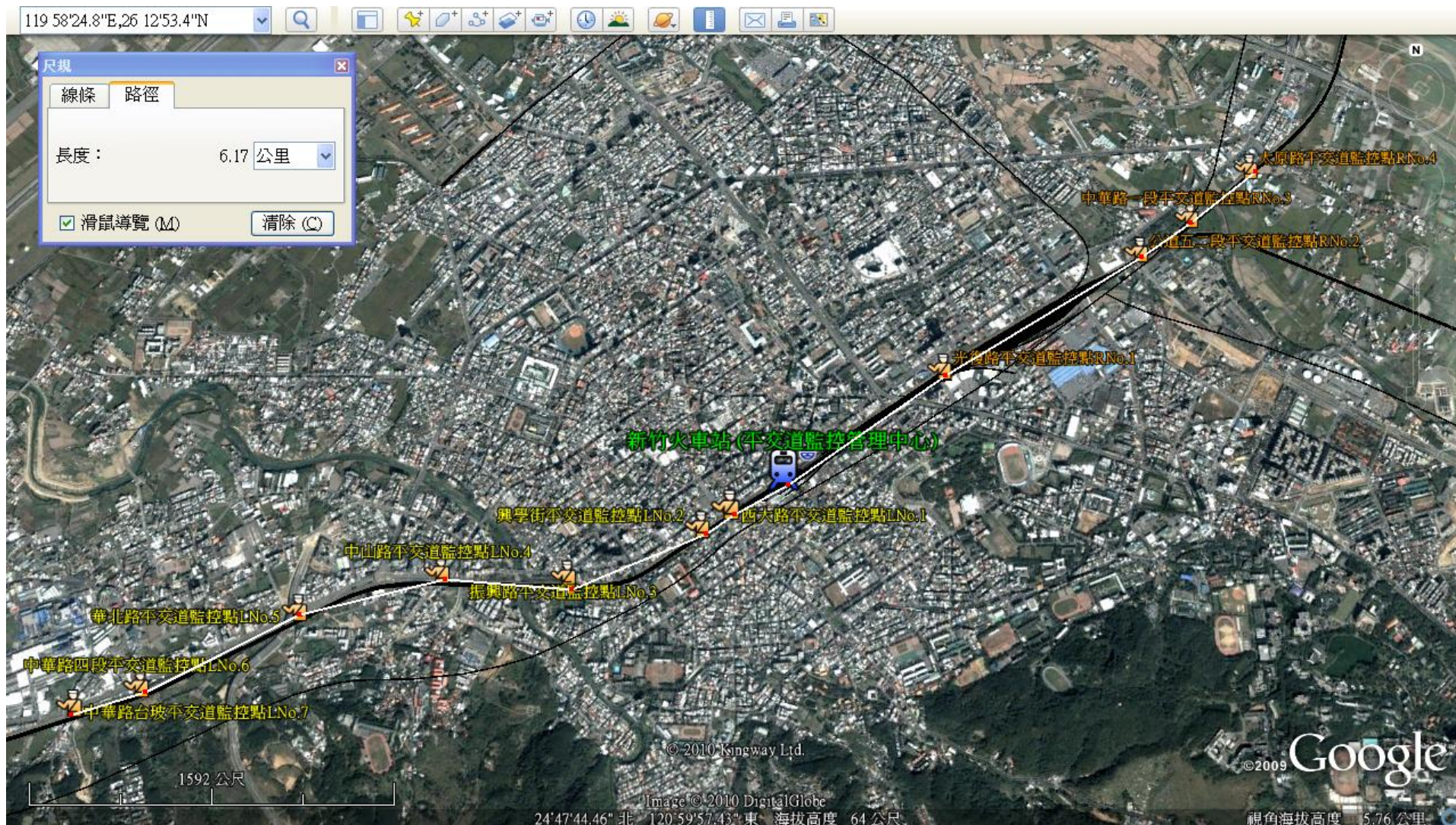
Long-range big bandwidth wireless supervisory system design: The Wireless systems with MIMO WiFi wireless devices to provide the 320Mbps big bandwidth the transmission backbone. Inducts wireless Multiple Hops to relay the diving platform technology continuously, Multiple Hops once a relay platform, about 5~8Mbps bandwidth reduction, after the fifth relay platform, the bandwidth will remain 120~140Mbps, no longer reduces bandwidth.

Emergency power cut, without disruption to operation surveillance video System design: Uses Solar DC UPS power System, can support more than 120hours (5days~) wet weather to provide outdoor wireless system and surveillance system power supply. Even if the temporary power cut or the special condition, the camera and the wireless transmission system still could operate normally surpass above 24 hours, achieves the wireless monitoring panic stations or the power cut condition, the persistent effect does not interrupt the monitoring video recording operation request.



5. Simulation 'Hsinchu train station' plan proposal

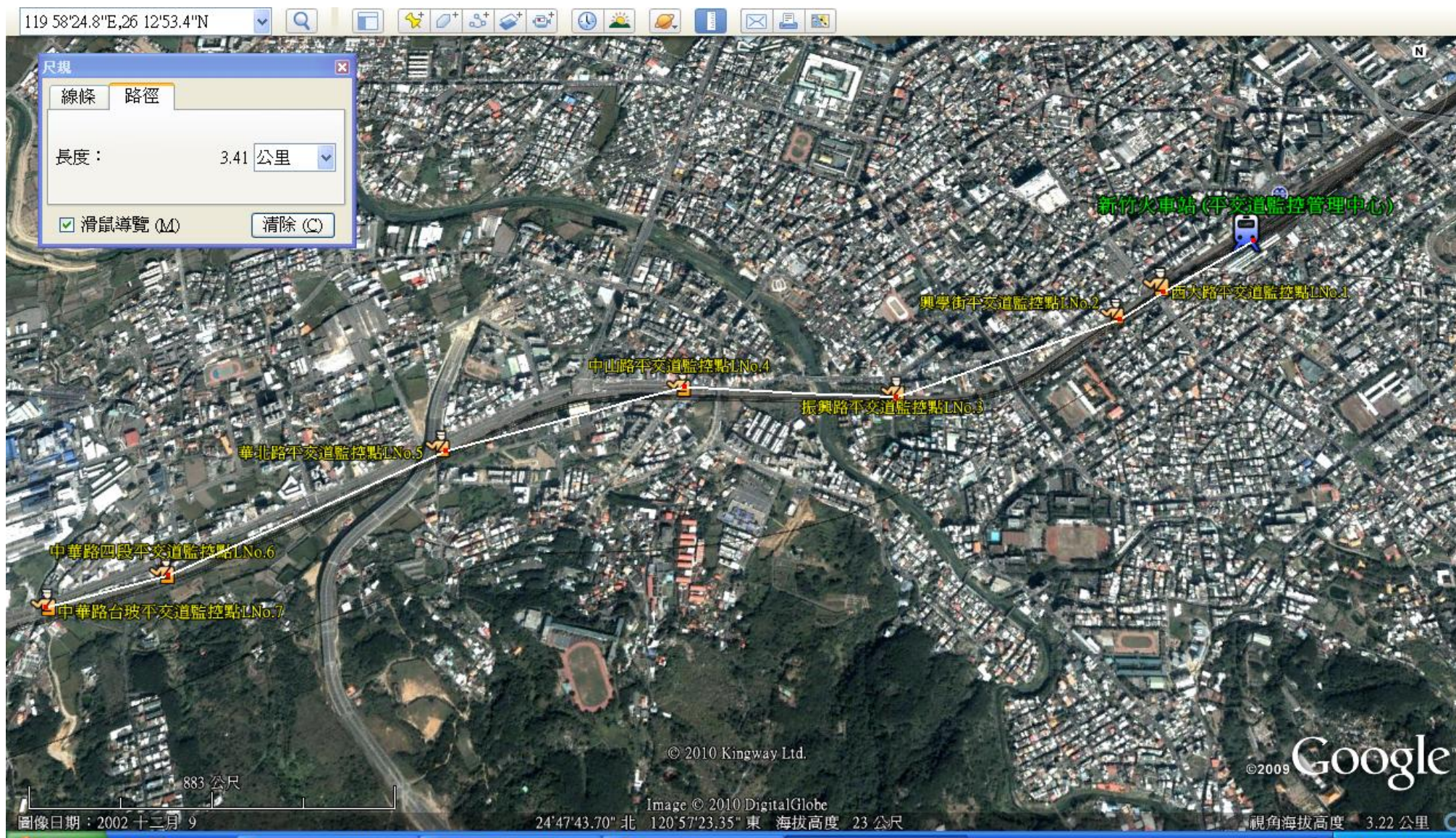
The Hsinchu trains station (in Taiwan) both sides crossings digital monitor the diagram: total length of about 6.17 km





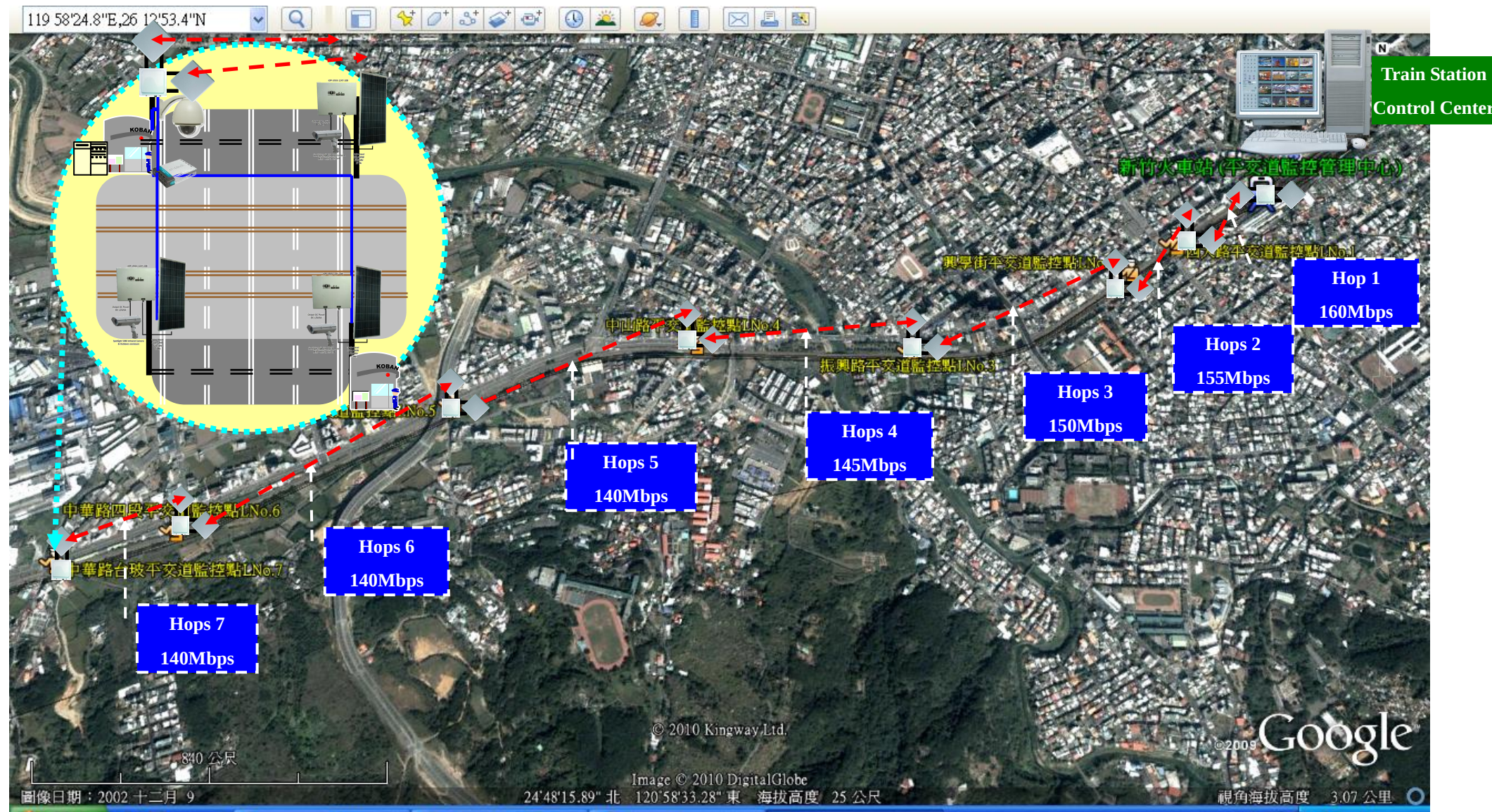
6-1. Simulation 'Hsinchu train station' left side level crossing plan proposal

The Hsinchu train station left crossings digital monitor the diagram: total length of about 6.17 km





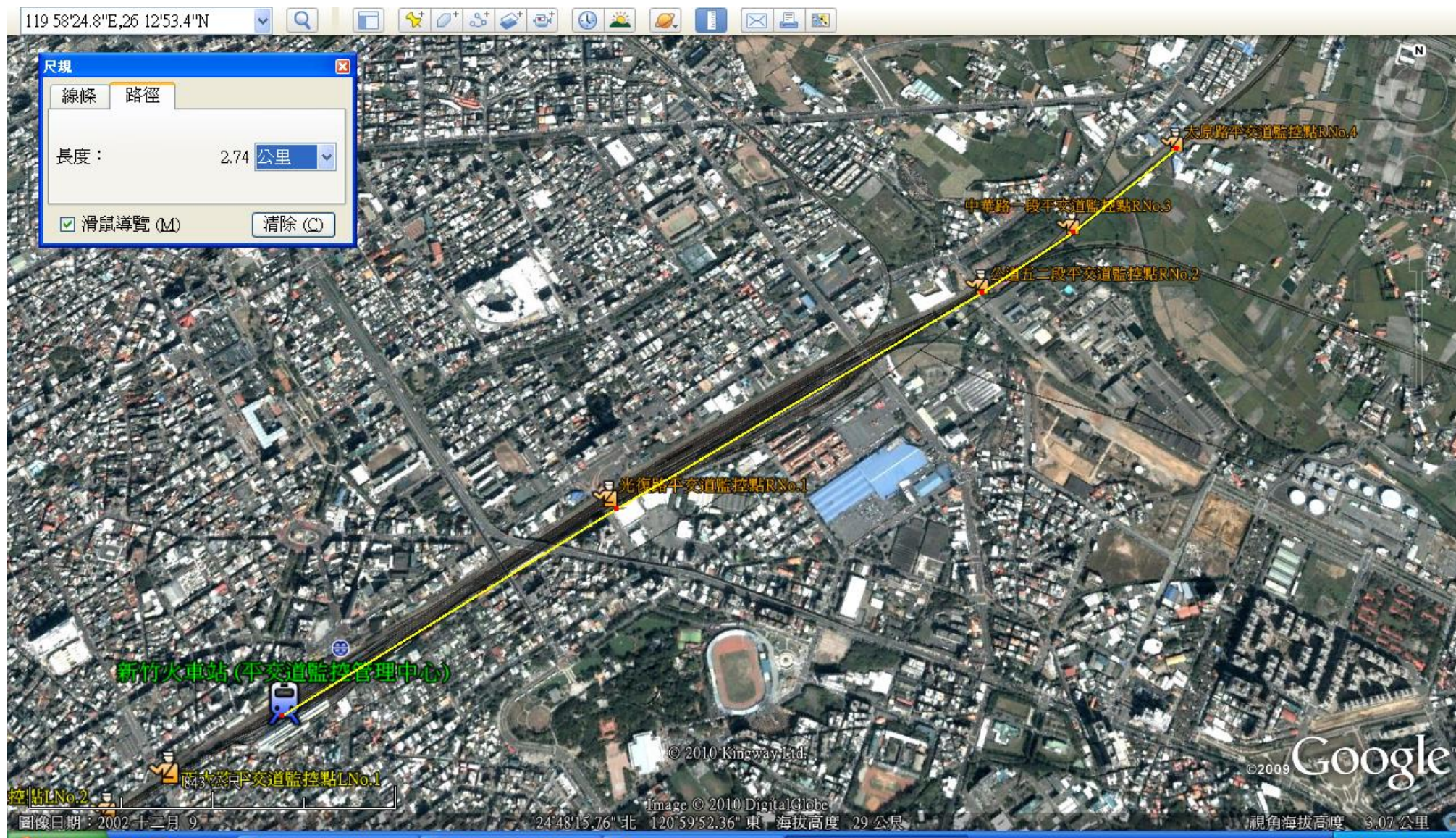
6-2. Train station left crossings: MIMO Wireless relay platform transmission design (Multiple Hops)





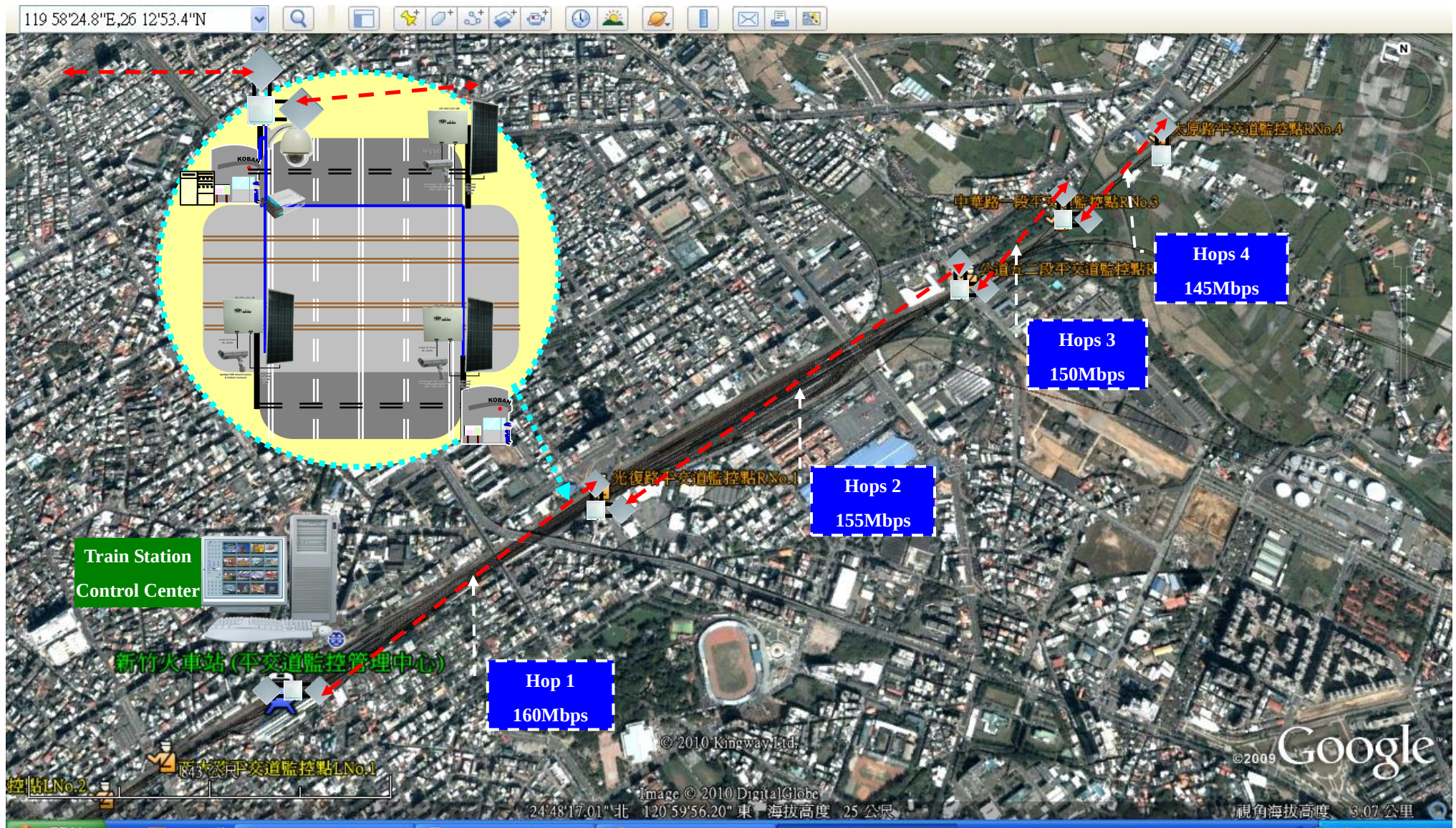
7-1. Simulation 'Hsinchu train station' right flank level crossing plan proposal

The Hsinchu train station left crossings digital monitor the diagram: total length of about 2.74 km





7-2. Train station right crossings: MIMO Wireless relay platform transmission design (Multiple Hops)

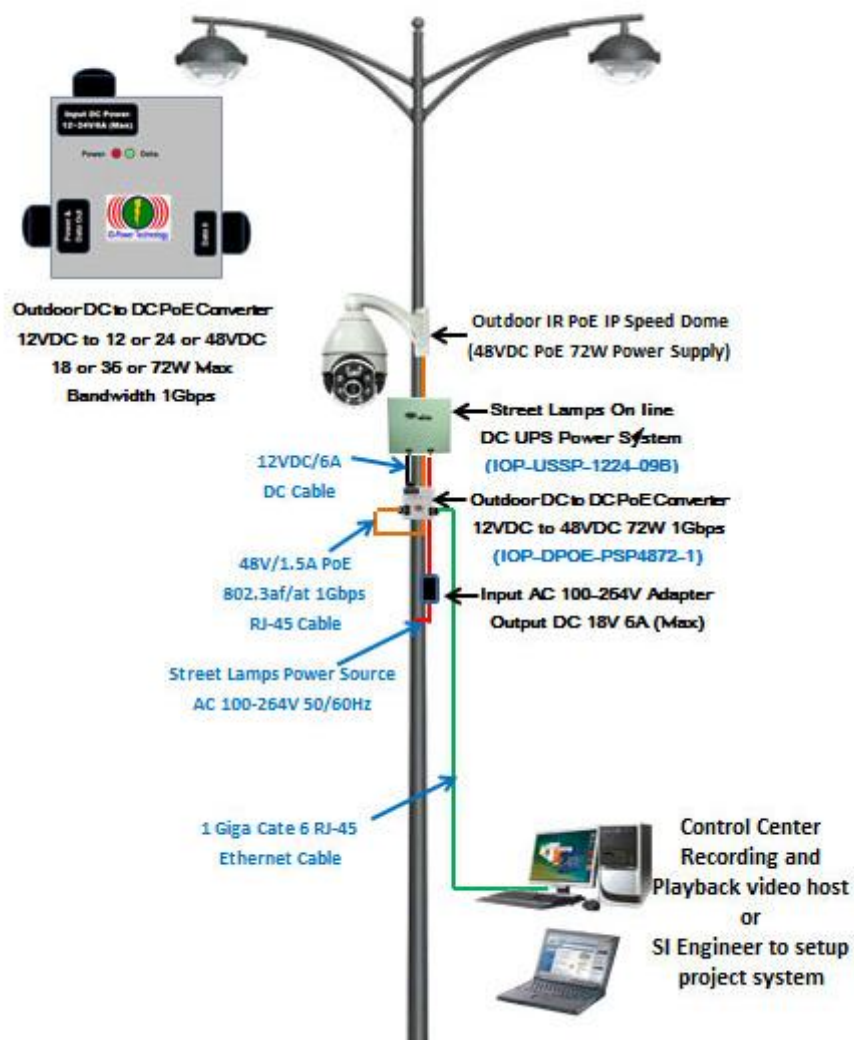




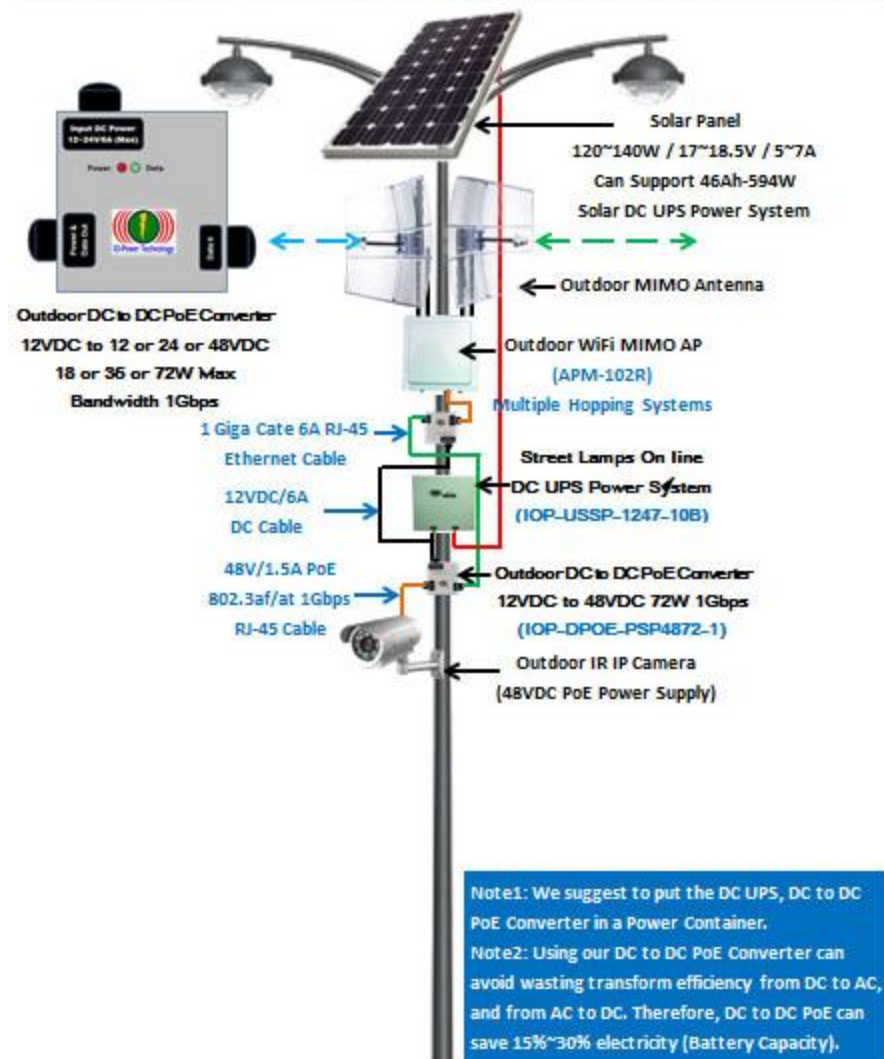
8-1. 『Solar DC UPS power system and DC UPS power system with 12VDC PoE Converter power system solution』 the plan proposal

Road Cross Surveillance System

with Street Lamps DC UPS & DC to DC PoE Converter for IP Speed Dome Power Solution



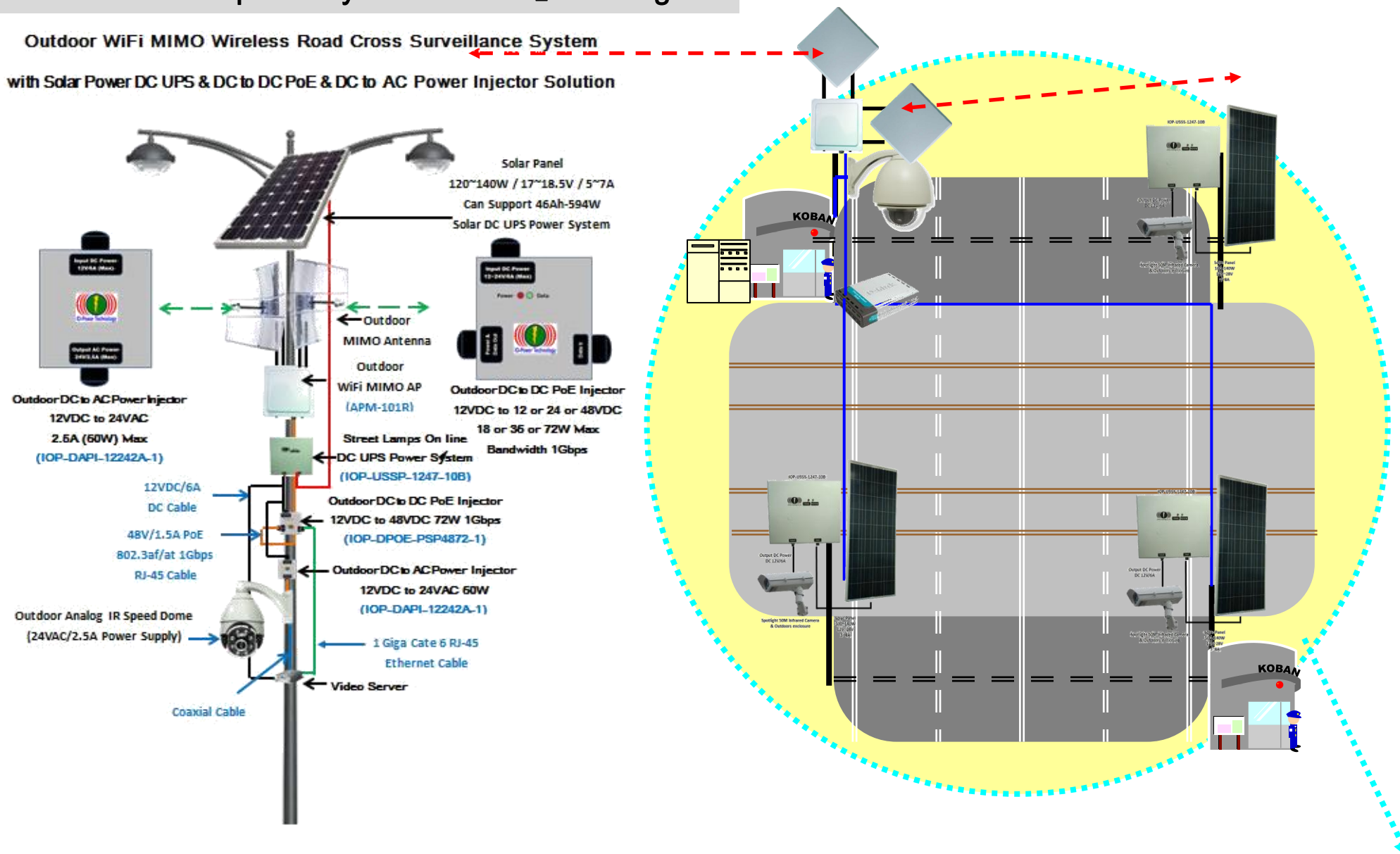
Outdoor WiFi MIMO Wireless Road Cross Surveillance System with Solar Power DC UPS & DC to DC PoE Converter Power Solution





8-2. 『DC UPS power system and Solar DC UPS power system with 12VDC to 48VDC PoE Converter &

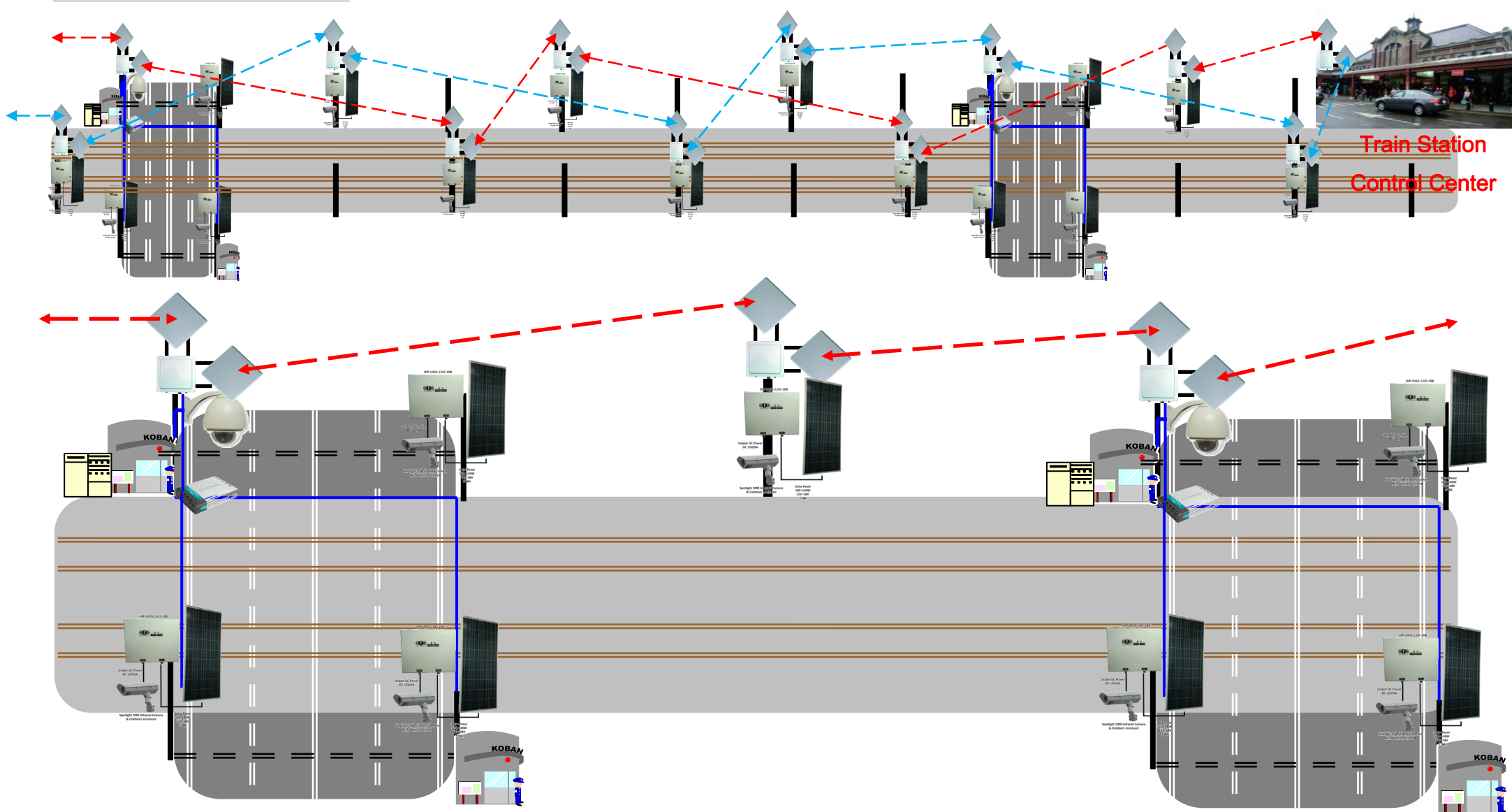
12VDC to 24VAC power system solution』 the diagram1





8-3. 『Solar DC UPS power system with outdoor wireless MIMO AP for train crossing wireless surveillance system』 the diagram

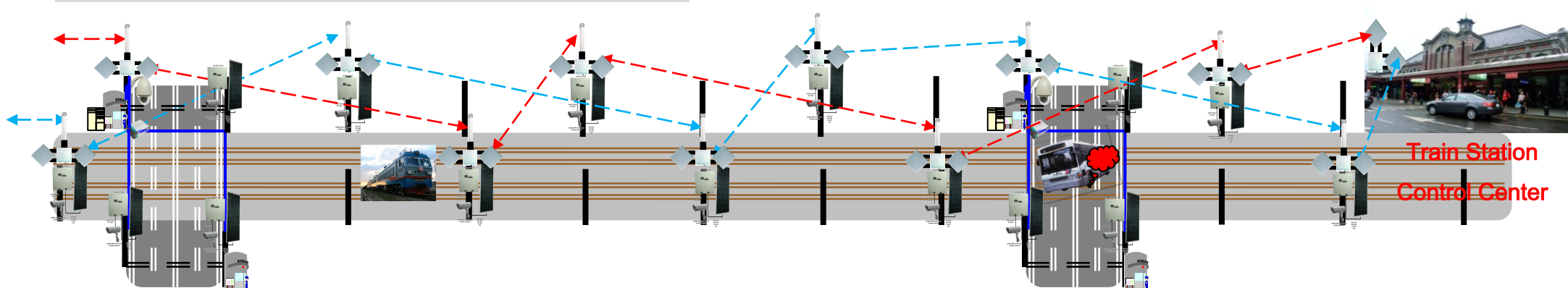
Wireless MIMO AP Multiple Hops Feature can support 10 Hops 120Mbps Throughput



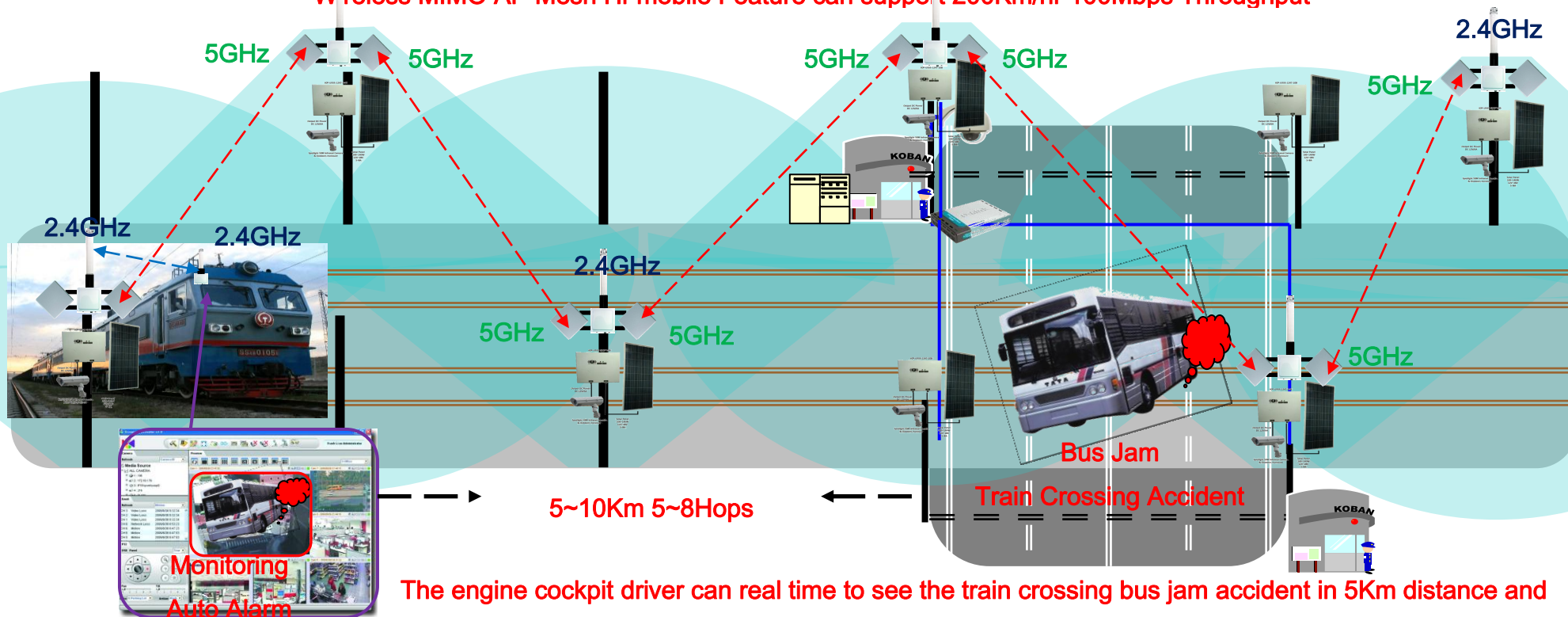


8-4. 『Solar DC UPS power system with outdoor wireless MIMO Mesh AP for train crossing wireless

Hi-mobile surveillance system 』 the diagram



Wireless MIMO AP Mesh Hi-mobile Feature can support 200Km/hr 100Mbps Throughput



The engine cockpit driver can real time to see the train crossing bus jam accident in 5Km distance and try to start the stop train step by step.



9. Product Specifications

Hardware Specification

Key Components	
Main Processor	Atheros AR7161(680Mhz)
Wireless Chipset	Atheros AR9220 based mini PCI module, Up to three modules
Switch Controller	Atheros AR8035 / Atheros AR8021
Flash Memory	16MBytes
SDRAM	128MBytes
Console	UART x 1(PCBA onboard)

Interfaces	
Wireless	Up to three 2x2 MIMO radios, mini-PCI version 1.0 type 3A Frequency ranges : a. USA : 2.400 ~ 2.483 GHz, 5.15 ~ 5.35 GHz, 5.5 ~ 5.7 GHz, 5.725 ~ 5.825 GHz



b. Europe: 2.400 ~ 2.483 GHz, 5.15 ~ 5.35 GHz, 5.47 ~ 5.725 GHz

c. Japan: 2.400 ~ 2.497 GHz, 5.15 ~ 5.35 GHz, 5.47 ~ 5.725 GHz

d. China: 2.400 ~ 2.483 GHz, 5.725 ~ 5.85 GHz

RF output power of DNMA-92 :

a. IEEE802.11a

1. 21dBm@6M(all)

2. 17dBm@54M(5180MHz) 16dBm@54M(5825MHz)

b. IEEE802.11g

1. 23dBm@6M(all)

2. 19dBm@54M(all)

c. IEEE802.11a/n HT20

1. 21dBm@MCS0/8(5180MHz) 19dBm@MCS0/8(5825MHz)

2. 16dBm@MCS7/15(5180MHz) 14dBm@MCS7/15(5825MHz)

d. IEEE802.11a/n HT40

1. 19dBm@MCS0/8(5190MHz) 18dBm@MCS0/8(5795MHz)

2. 13dBm@MCS7/15(all)

e. IEEE802.11g/n HT20

1. 21dBm@MCS0/8(all)



2. 17dBm@MCS7/15(all)

f. IEEE802.11g/n HT40

1. 21dBm@MCS0/8(2422MHz) 20dBm@MCS0/8(2462MHz)

2. 16dBm@MCS7/15(all)

Receive Sensitivity of DNMA-92 :

a. IEEE802.11a

1. -82dBm@6M, 1Rx -95/-91dBm@6M, 2Rx

2. -65dBm@54M, 1Rx -79/-75dBm@54M, 2Rx

b. IEEE802.11g

1. -82dBm@6M, 1Rx -95/-91dBm@6M, 2Rx

2. -65dBm@54M, 1Rx -80/-76dBm@54M, 2Rx

c. IEEE802.11a/n HT20

1. -82dBm@MCS0, 1Rx -95/-91dBm@MCS0, 2Rx

2. -64dBm@MCS7, 1Rx -77/-73dBm@MCS7, 2Rx

d. IEEE802.11a/n HT40

1. -79dBm@MCS0, 1Rx -91/-87dBm@MCS0, 2Rx

2. -61dBm@MCS7, 1Rx -74/-70dBm@MCS7, 2Rx

e. IEEE802.11g/n HT20



1. -82dBm@MCS0, 1Rx -95/-91dBm@MCS0, 2Rx

2. -64dBm@MCS7, 1Rx -77/-73dBm@MCS7, 2Rx

f. IEEE802.11g/n HT40

1. -79dBm@MCS0, 1Rx -90/-86dBm@MCS0, 2Rx

2. -61dBm@MCS7, 1Rx -74/-71dBm@MCS7, 2Rx

RF output power of DNMA-H92 :

a. IEEE802.11a

1. 24dBm@6M(all)

2. 21dBm@54M(all)

b. IEEE802.11g

1. 25dBm@6M(all)

2. 22dBm@54M(all)

c. IEEE802.11a/n HT20

1. 24dBm@MCS0/8(all)

2. 18dBm@MCS7/15(5180MHz) 17dBm@MCS7/15(5825MHz)

d. IEEE802.11a/n HT40

1. 22dBm@MCS0/8(all)

2. 17dBm@MCS7/15(5190MHz) 16dBm@MCS7/15(5795MHz)



e. IEEE802.11g/n HT20

1. 25dBm@MCS0/8(all)
2. 21dBm@MCS7/15(all)

f. IEEE802.11g/n HT40

1. 24dBm@MCS0/8(all)
2. 20dBm@MCS7/15(all)

Receive Sensitivity of DNMA-H92 :

a. IEEE802.11a

1. -82dBm@6M, 1Rx -95/-91dBm@6M, 2Rx
2. -65dBm@54M, 1Rx -79/-75dBm@54M, 2Rx

b. IEEE802.11g

1. -82dBm@6M, 1Rx -95/-91dBm@6M, 2Rx
2. -65dBm@54M, 1Rx -80/-76dBm@54M, 2Rx

c. IEEE802.11a/n HT20

1. -82dBm@MCS0, 1Rx -95/-91dBm@MCS0, 2Rx
2. -64dBm@MCS7, 1Rx -77/-73dBm@MCS7, 2Rx

d. IEEE802.11a/n HT40

1. -79dBm@MCS0, 1Rx -91/-87dBm@MCS0, 2Rx



	2.-61dBm@MCS7, 1Rx -73/-69dBm@MCS7, 2Rx e. IEEE802.11g/n HT20 1.-82dBm@MCS0, 1Rx -95/-91dBm@MCS0, 2Rx 2.-64dBm@MCS7, 1Rx -77/-73dBm@MCS7, 2Rx f. IEEE802.11g/n HT40 1.-79dBm@MCS0, 1Rx -92/-88dBm@MCS0, 2Rx 2.-61dBm@MCS7, 1Rx -74/-70dBm@MCS7, 2Rx
Ethernet	10/100/1000 Base-TX MDI/MDIX RJ-45 x 1 Compliant with : a. IEEE802.3 / 802.3u / 802.3at Hardware based 10/100/1000, full/half, flow control auto negotiation
Connector	2 x N-type(1 radio) 4 x N-type(2 radios) 6 x N-type(3 radios)
Power Requirement	48V 1A PoE Support Gigabit Ethernet Link
Watch Dog	Hardware Watch Dog

**Physical**

Dimensions	220 x 220 x 77 mm
Weight	101R/101RH—1.8Kg 102R/102RH—1.9Kg 103R/103RH—2.0Kg 2.0kg (3.7kg mount kit included)

Environmental

Temperature Range	-20°C~70°C
Humidity	0% ~ 95% Non-condensing
Storage	-40~ 85°C
Dusty & Waterproof	Outdoor IP67 rated

Regulatory

Certification	FCC, CE Processing (will announce in 2011/12)
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Safety

Processing

Software Specification

System Operation

Bridge Mode

Layer 2 Switching Learning Technology

Store-and-Forward

Spanning Tree Protocol - IEEE 802.1d STP / IEEE 802.1w RSTP / IEEE 802.1s MSTP

Static IP / Dynamic IP

DHCP server / client

Multicast / Broadcast Storm Limitation

IEEE 802.1q Tag VLAN

IEEE 802.1p VLAN Priority Based QoS

Network Interface



Wireless	IEEE 802.11 a/b/g/n 2.4GHz / 5GHz Dual Band Radio
	2 x 2 MIMO Technology
	Single Radio / Dual Radios / Triple Radios
	AP mode / Client mode / WDS mode
	IEEE 802.11h DFS
	WMM QoS
	Channel / Tx Power / Data Rate / Max Distance Adjustable
	Advanced Wireless Parameters Adjustable
	Multi-SSIDs / VLAN tags mapping(Up to 16 x ESSIDs for each radio)
	Wireless Site Survey
	Node Information
	Concurrent Connected Node Limitation
	Client User Isolation



Wire	48V 1A PoE Support Gigabit Ethernet Speed
	Ethernet Link Speed Configurable
	10/100/1000 Base-TX MDI/MDIX RJ-45

Performance		
Wireless To Wire	TCP	Up to 180Mbps for one radio to Ethernet
		Up to 320Mbps for two radios to Ethernet
		Up to 320Mbps for three radios to Ethernet
	UDP	Up to 240Mbps for one radio to Ethernet
		Up to 350Mbps for two radios to Ethernet
		Up to 350Mbps for three radios to Ethernet
	PPS	>= 20,000@short packet for one radio to Ethernet
		>= 28,000@short packet for two radios to Ethernet



		>= 28,000@short packet for three radios to Ethernet
	Latency	< 5ms
Multiple Hops	2 hops	Up to 160Mbps
	3 hops	Up to 150Mbps
	>= 4hops	Up to 140Mbps
	PPS	>= 20,000@short packet at multiple hops
	Latency	< 10ms

Security

Hide SSID(turn off ESSID broadcasting)

MAC Address ACL

WEP 64/128/152 bits

IEEE 802.1x EAP-MD5 / EAP-TLS / EAP-TTLS



WPA / WPA2 PSK / EAP with TKIP / CCMP AES based Encryption

Management

HTTP(s) WEB GUI

Telnet

SSH

Console(optional interface)

CLI commands

SNMP v2c/v3, standard / private MIBs

Syslog

Management VLAN Tag

NTP Client

Firmware upgrade / downgrade

Dual Images

Dual Configuration files / Factory Default

Multiple Level Management



Advanced Technology	
Multiple Hopping	Up to 10 hops with more than 120Mbps throughput
	Configurable Max. Hop Counts(default 20 hops)
Advanced Features	Wireless Bandwidth Limitation

Advanced Technology	
Ultra-fast Roaming	Up to 200km/hr seamless handover speed
	Up to 100Mbps throughput
Mesh Cloud	Up to 120Mbps Wireless Mesh Backbone throughput
	Multiple Gateways Supporting
Advanced Features	Intelligent Wireless Traffic Control
	Intelligent Abnormal Reports
	Software Access Controller (Web Redirect Function)
	Against Co-band Interference
	Proprietary TDD-like duplexing schema (when co-working with IO-Power's devices)



IOP-PANFO-5M2001010

5GHz 20dBi Dual Polarization MIMO Panel Antenna

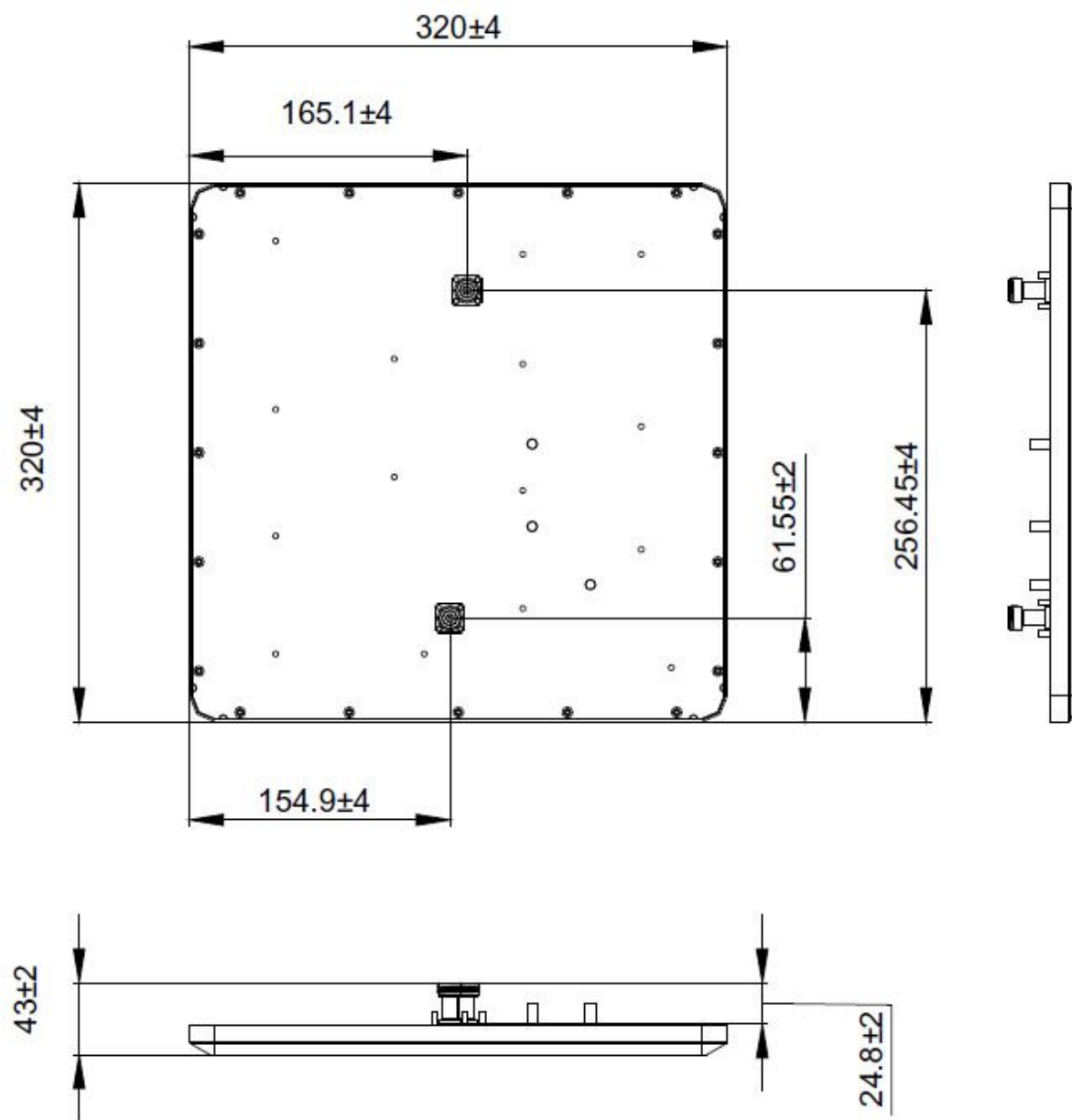
Electrical Specification	
Frequency range	5150 - 5875 MHz
Gain	20 dBi
VSWR	2 : 1 Max.
Polarization	Dual Linear, +- 45°
HPBW / Horizontal	10°
HPBW / Vertical	10°
Standard compliance	N / A
Front to back ratio	-30dB (Max)
Isolation	24dB (Min)
Power handling	6W (cw)





Impedance	50 Ohms
Connector	N Jack × 2
Environmental & Mechanical Characteristics	
Survival wind speed	216Km/hr
Temperature	-40°C to +80°C
Humidity	95% @ 55°C
Lightning protection	DC ground
Radome color	Gray
Radome material	PC, UV resistant
Weight	1245g
Dimensions	320 × 320 × 20 mm
Waterproof	IP-67
Mounting kit	Pole mount & Wall mount

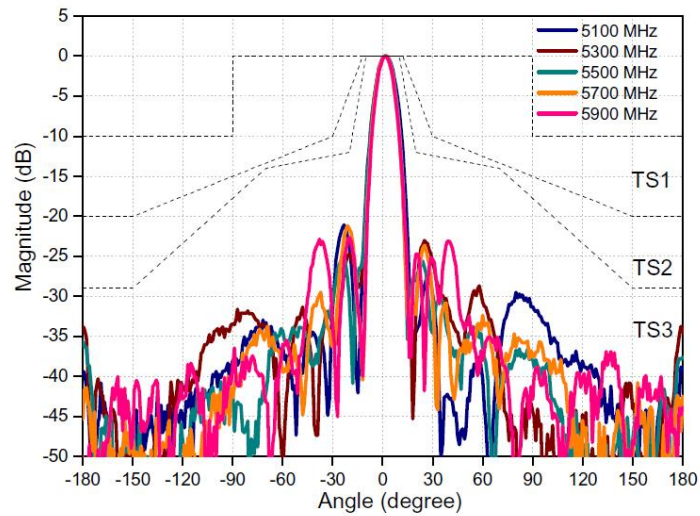
*exclusive of mounting kit



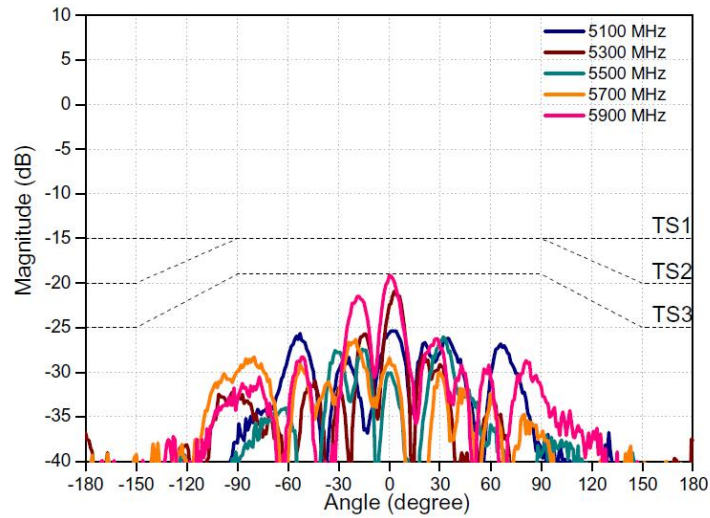


Port 1

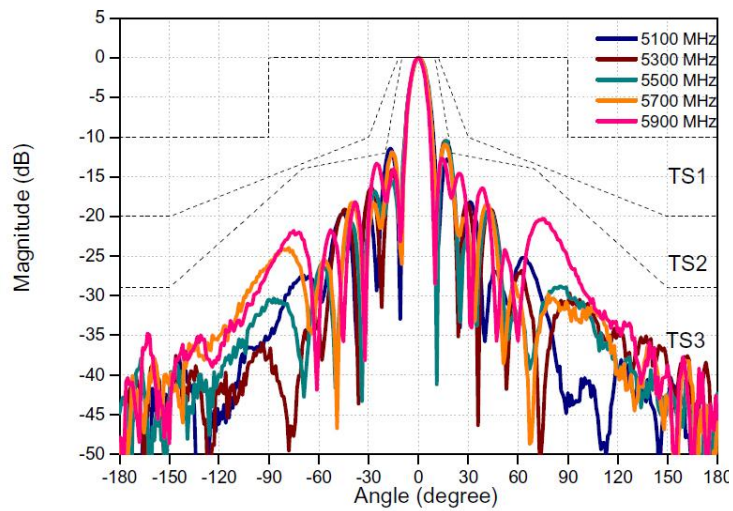
V-plane Co-polarization Pattern



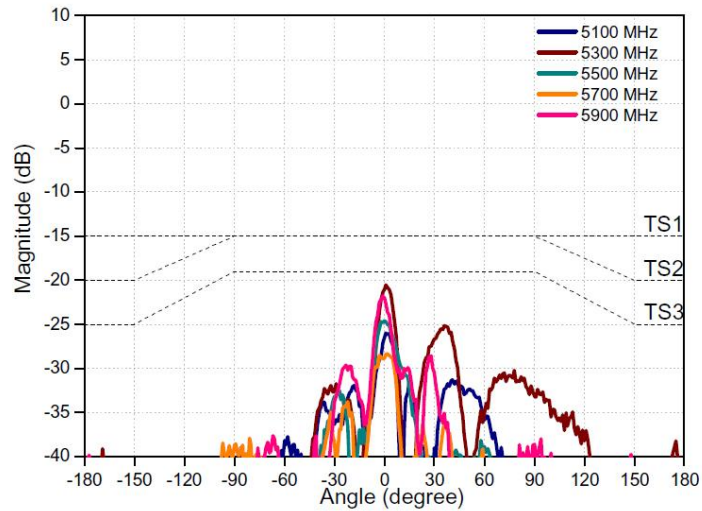
V-plane Cross-polarization Pattern



H-plane Co-polarization Pattern



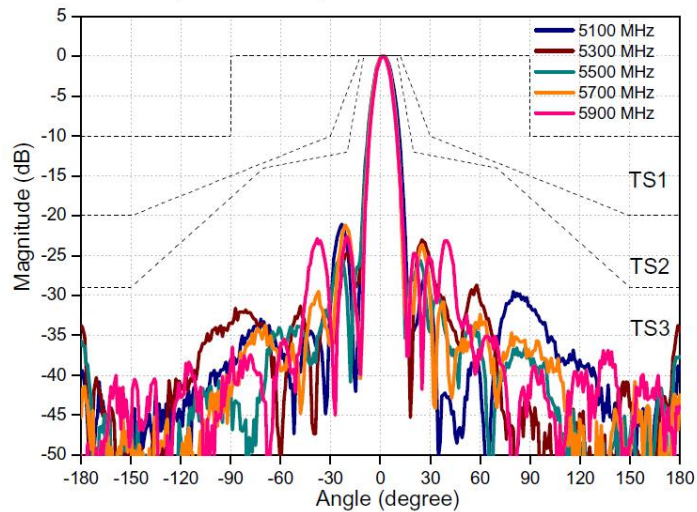
H-plane Cross-polarization Pattern



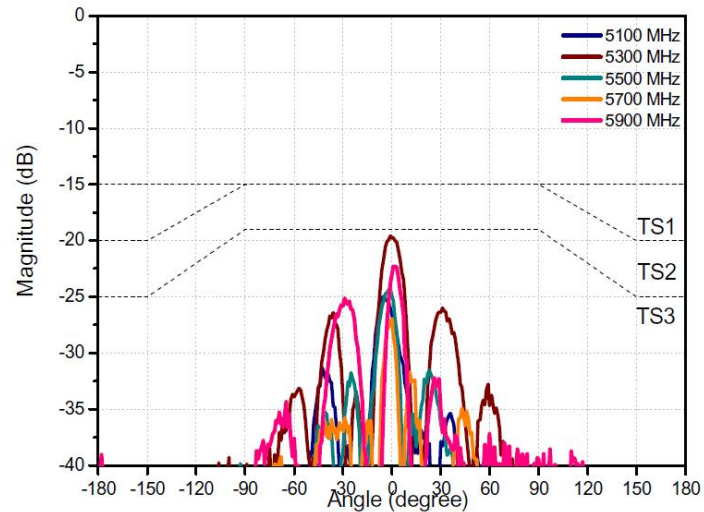


Port 2

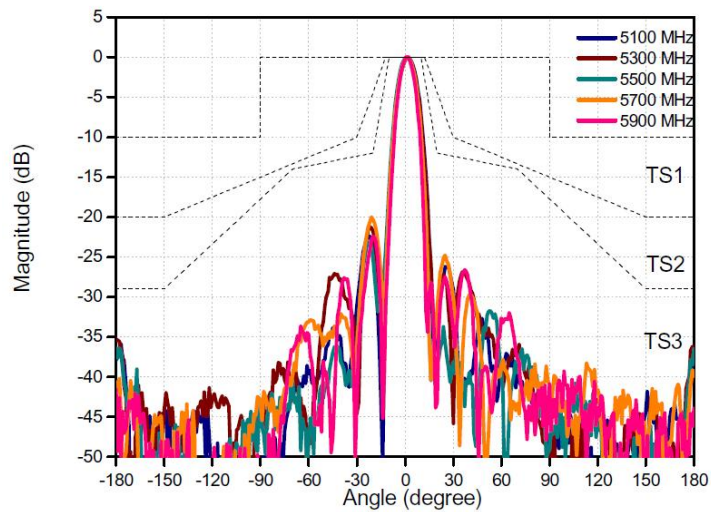
V-plane Co-polarization Pattern



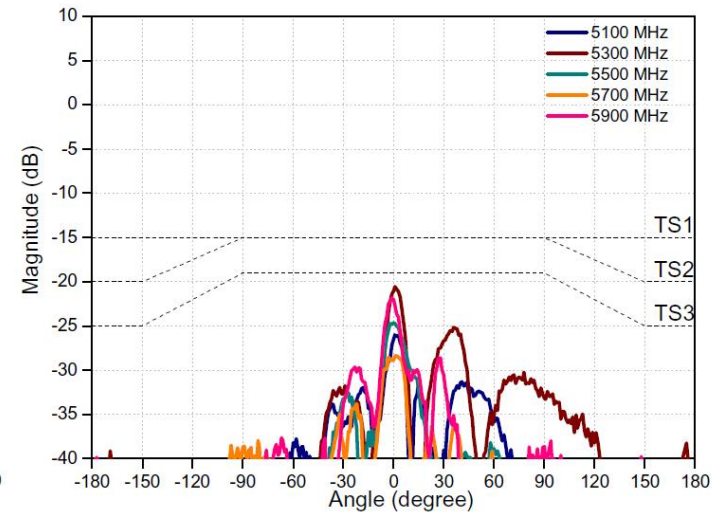
V-plane Cross-polarization Pattern



H-plane Co-polarization Pattern



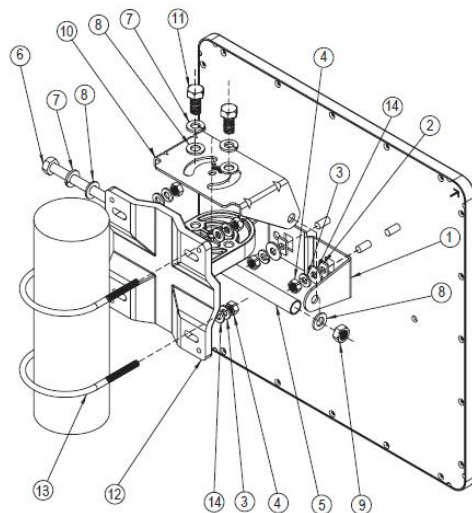
H-plane Cross-polarization Pattern



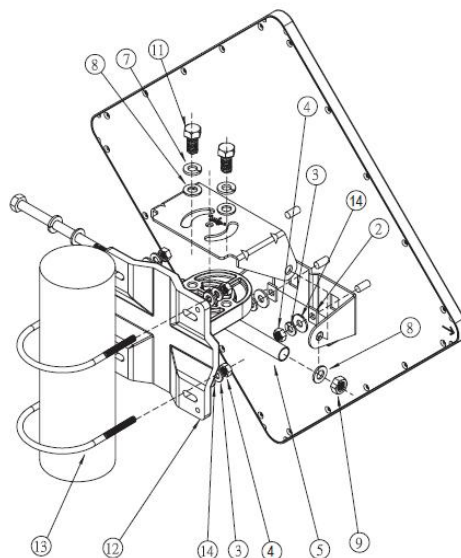


Pole Mount

Slant±45 Degree Polarization



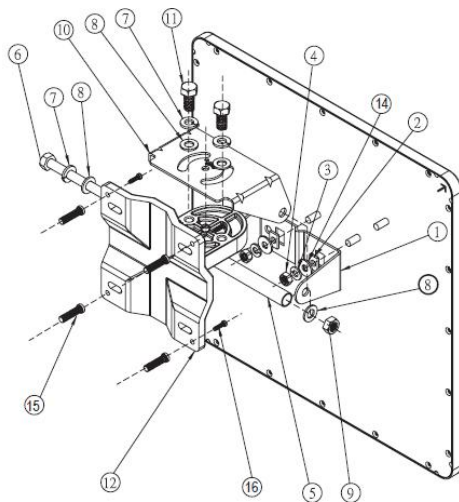
Hor. & Ver. Polarization



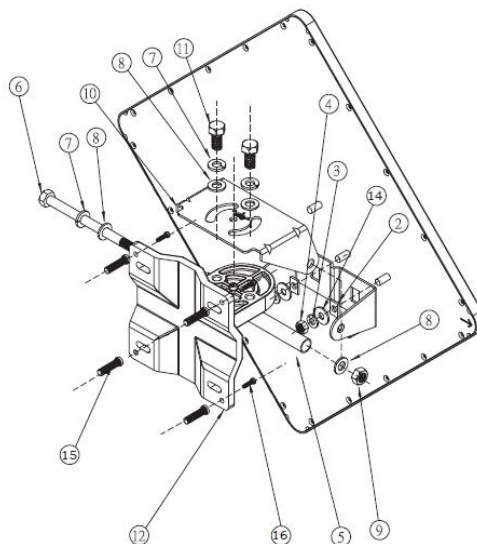
- | | |
|------------------------|------|
| 1. M-Type breaket (L) | 1Pcs |
| 2. Space Keeper | 2Pcs |
| 3. Spaing washer | 6Pcs |
| 4. M6-1.0 Nut | 6Pcs |
| 5. Steel tube 93.2 mm | 1Pcs |
| 6. XHM8-1.25*120 | 1Pcs |
| 7. M8 spring washer | 3Pcs |
| 8. M8 washer | 4Pcs |
| 9. M8 Nut | 1Pcs |
| 10. Rotating bracket | 1Pcs |
| 11. XHM8-1.25*20 | 2Pcs |
| 12. Mounting main fram | 1Pcs |
| 13. U-Type Screw | 2Pcs |
| 14. M6 washer | 6Pcs |
| 15. Wall Tiger | 4Pcs |
| 16. TH 5/32-16*1" | 4Pcs |

Wall Mount

Slant±45 Degree Polarization



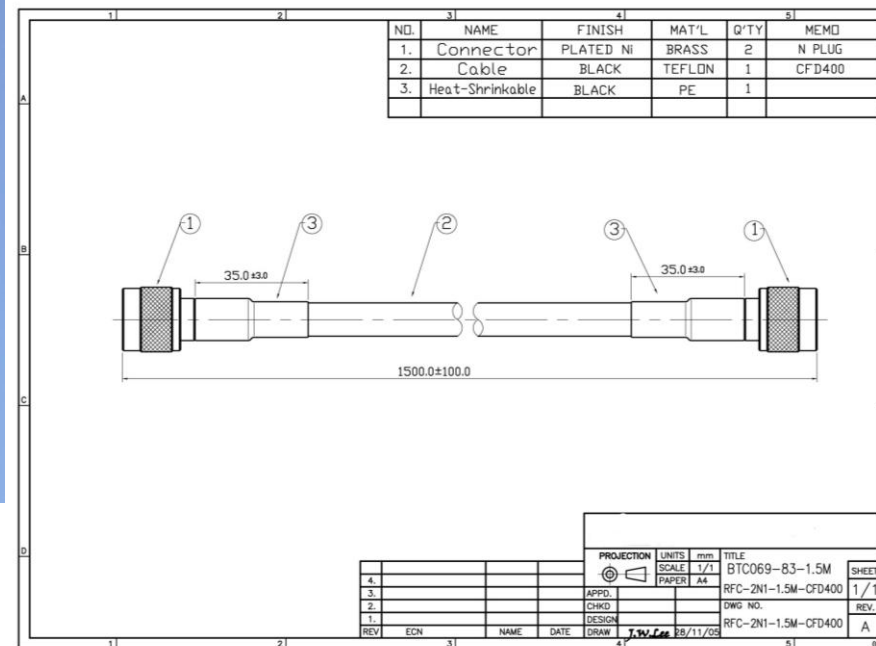
Hor. & Ver. Polarization





IOP-RFCFD-400150NMR

CFD-400 N-Type 1.5M Antenna RF Cable





CFD-400 RF Cable SPEC

Standard: CFD400 (CFD400-E) CABLE 1/2.74MM X 1C

CONSTRUCTION:

ITEM		UNIT	2.74MM
No. of Wire		P · C	1C
1) Conductor	Material	—	Copper Clad Aluminium
	Size	No./mm	1/2.74
2) Insulation	Material	—	PEF
	Thickness	mm	(NOM.) 2.2
	O.D	mm	(NOM.) 7.24
3) Binder		—	Sealed Aluminum Mylar Tape
4) Braid Shield	Material	—	Tinned Copper Wire
	Coverage	%	85% ↑
5) Jacket	Material	—	PVC or PE
	O.D	mm	10.3±0.25

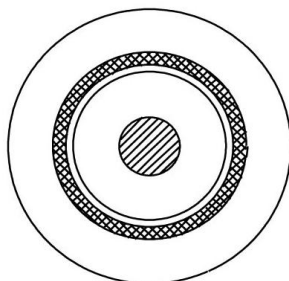
MECHANICAL PROPERTIES:

ITEM		UNIT
Minimum Bend Radius	mm	25.4
Weight	kG/m	0.1
Tensile strength	kG	72.6
Operating temperature	°C	-40/85

ELECTRICAL PROPERTIES (20°C):

ITEM	UNIT	
Conductor Resistance	Ω /Km	1.67
Impedance	Ω	(NOM.) 50
Capacitance	PF/FT	(NOM.) 23.9
Velocity of propagation	%	(NOM.) 85
DC resistance, inner cond.	Ω /Km	4.56
DC resistance, outer cond.	Ω /Km	5.41
Shielding effectiveness	dB	≥90

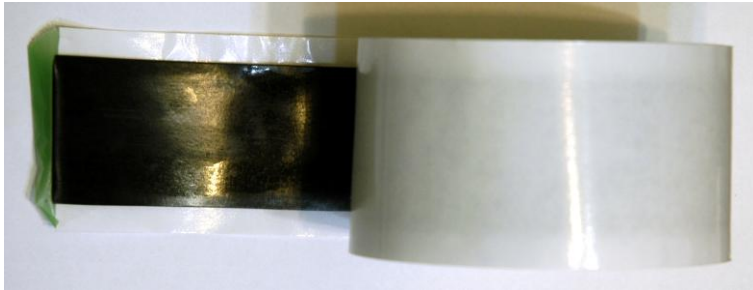
Attenuation (nom.)	
MHz	dB/100ft
30	0.7
50	0.9
150	1.5
450	2.7
900	3.9
1500	5.1
2000	6.0
2500	6.8
5800	10.8





IOP-RMTOC-173830510B

Self-Bonding Rainproof Insulating Tape SPEC





Specifications and instructions for use

1. The scope of:

- 600V Low-voltage connector used for sealing and insulation
- High and low voltage bus of anti-corrosion protection, maintenance of high pressure joints of waterproofing treatment

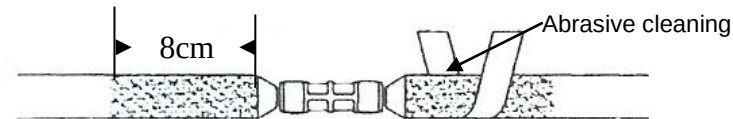
2. Conditions of use:

- Environment temperature is below 40 °C
- Continuous operating temperature: 90 °C below 130 °C under low pressure overload and emergency operation linkage PE joints of copper or aluminum cables.

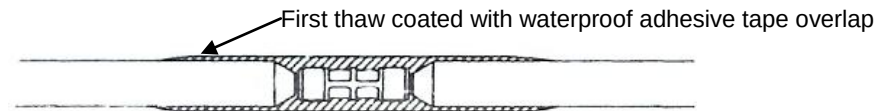
3. Characteristics:

- Voltage level : 600V
- AC voltage : Above 25KV
- Insulation resistance : $1 \times 10^6 \text{M}\Omega$
- Black, thickness : $1.7\text{mm} \pm 0.5\text{mm}$
- Adhesion/split : Below 2cm
- Extension rate : Above 1000%
- Tensile breaking force : Above 2Kg
- Water absorption : Below 0.2%
- Stability : 130°C/100hrs No gum

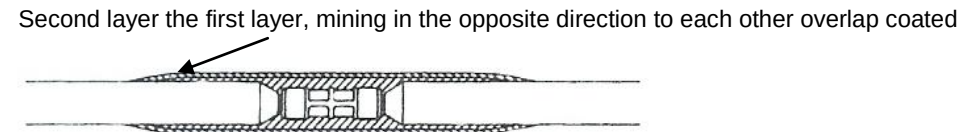
4. Instructions for use: With low-voltage cable straight connector as an example



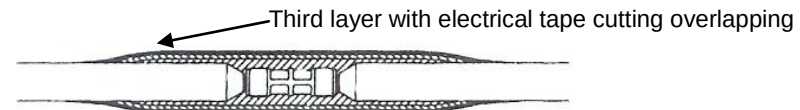
Step 1: abrasive cleaning at the both ends of the cable connectors and covered 8cm



Step 2: using thawed waterproof tape coated joints and covered on average 8cm



Step 3: use thaw average coated joints overlapped each other waterproof tape and covered 10cm



Step 4: finally uses the common PVC tape (electrical tape) overlap each other last average coating 12cm



IO-Power USSS-12V3547-OA Series

Solar Collection Cloudy Large Capacity Model

Next Generation Solar Collection Energy Online Type Power Generation System



IO-Power USSS-12V3547-OA series is focusing on systems engineering at the time of outdoor construction, was unable to make stable and effective source of power, resulting in project implementation cannot be complete acceptance problems facing proposed integration of the next generation solar collection energy for DC power with high and low temperature resistance of C-LiFePO₄ lithium batteries for high current outdoor power consumption load system and special equipment, the design of new outdoor solar online type of collection energy power systems solutions, Solve systems engineering construction cannot get stable outdoors power problems effectively, able to cope with the high current discharge such as a DVR (Digital Video Recorder) analog into digital imaging video host, NVR (Network Video Recorder), digital imaging, infrared cameras, infrared ray projector video host, thermal energy conversion devices forth Large discharge current devices, such as solar collection energy type online without disrupting the operation of power systems.



IO-Power technology import latest technology of resistance high and low temperature C-LiFePO₄ lithium battery, take online type does not interrupt of new solar technology design in wet weather environments, has been able to capture a limited DC power and provide batteries and device basic operating power source, reach the most energy-efficient solar-powered online type of collection energy not interrupt supply system. Through wet weather can collection power design, reduced solar cell plate of area and reduced battery of using capacity, import C-LiFePO₄ lithium battery of resistance high low temperature, characteristics, implementation solar system-erection cost more low, erection space more small, using battery life cycle more long, maintenance cost more low and get power energy mode full independent, it will let systems engineering commercial real willing to used solar system became next-generation outdoor take electric of resolved solutions.

Next generation solar collection energy online type power generation system by match of long-term C-LiFePO₄ lithium battery, may according to related system device of total electricity consumption demand, integration appropriate corresponds to of battery total capacity and solar cell plate Watts number, to provides at least 72-144 hours of device operation power, enough meet continuous 3~6days cloudy of using environment.



IOP-USSS-12V3547-OA series, used industrial level of aluminum metal thermal protection shell and waterproof dust reached IP67 of institutions design and the industrial level resistance high low temperature M12 connector, to meet outdoor-20 ° C~+45 ° C harsh of environment temperature test, let outdoor solar constantly electric power system still can day and night security and stability of normal operation, while and import latest technology of resistance high low temperature C-LiFePO4 lithium battery and unique charging and discharging battery management control and the static zero power and so on Patented technology, realization of outdoor wall mount and vertical bar set up long-term safety of solar collection energy online type power generation system for new applications.

Next generation solar collection energy online type power generation system, import solar match C-LiFePO4 lithium battery of power application characteristics, may directly application for DVR video host, NVR video host, outdoor cable monitored system, outdoor far from wireless monitored system, outdoor infrared video monitored security system, outdoor infrared projection lamp, outdoor data capture device system, outdoor alternate power system, expressway charges trading video monitored and the license plate identification records system, outdoor large electronic advertising brand transmission system, Elevator security video surveillance systems, mobile power supply system, 24-hour traffic camera system of



records, the pit and special working environment safety protection system of equipment systems, financial institutions, fire safety systems ...And so on.

IO-Power USSS-12V3547-OA series, solar collection energy online type power generation system of the system components including:

1. Enter the DC power port: solar panel 12V~28V DC power supply voltage input, solar collection energy online type uninterruptible operation power system of operation in power source.
2. Microprocessor modules: microprocessors for enter the solar DC to detect power management, battery management power control, battery management, output management, system operations control detection and protection management, perform dimensional transport co-ordination and control of the overall system management.
3. The charging and discharging control circuit: charging voltage for battery detection and balance battery discharge management and management control, with unique CCP/CVP patented charging technology, supported by static discharge patent protection mechanism of zero-power, low voltage protection and rapid recovery operation of the battery to provide the best protection and the efficient operation of the mechanism.



4. The DC power output port: DC power supply discharge detection through microprocessor control and protection, for load device power requirement, corresponds to the appropriate current of electricity supply from 0.5A to the minimum and maximum of 6A DC supply control.

5. Special strengthened of protection measures: for outdoor environment of high and low temperature changes, on battery of life and using efficiency, may produce serious effect, even produced using Shang of security problem, therefore for USSS-12V3547-OA outdoor type products series, special design industrial level confined aluminum metal thermal protection shell and waterproof dust reached IP67 of institutions design and the industrial level resistance high low temperature M12 connector, to avoid outdoor environment using Shang of security problem occurred.

6. Resistance high low temperature long-term C-LiFePO₄ lithium battery: due to should outdoor operation in the system of not interrupted and needed to large current large power way discharge and the more long-term using demand, traditional General of outdoor solar constantly electric power system, is obvious to cannot provides should have of service; USSS-12V3547-OA series take large current charging and large current of discharge system design, through new of C-LiFePO₄ lithium battery high charging and discharging number and large current large power discharge characteristics and the super long battery life, To provide more power than conventional solar power systems power capacity and



systematic operation times and 7 times more than double the life of the fully rendered solar energy set online without disrupting the operation of power system's outstanding characteristics.

7. Various types of high efficiency solar cells (or other DC input power): USSS-12V3547-OA of exterior products, to be completed with a variety of solar light (or other green energy such as wind power, hydroelectric power ...And so on), and total wattage from the 100W~140W, 12V~28V voltage ranges, current 5A~8A, C-LiFePO₄ lithium batteries energy storage capacity of 34.8Ah~46.4Ah, supported by cloudy power design can be easily achieved without disrupting the operation of the system of continuous cloudy day 3-6 day requirements, make the system truly enjoy the construction by the solar system and have easier access to unwanted power efficiency.



IOP-USSS-12V3547-OA Series Specification (* Patent Pending)

Model	IOP-USSS-1235-10B	IOP-USSS-1240-10B	IOP-USSS-1247-10B
Outdoor Model M12 Connector Aluminium Radiating Airtight Housing IP 67			
Power Capacity	445 WH (34.8Ah @ 12.8V)	515WH (40.2Ah @ 12.8V)	594 WH (46.4Ah @ 12.8V)
Solar Cell Input DC Voltage / Current	DC 12V~28V 24V/7A Max	DC 12V~28V 24V/7A Max	DC 12V~28V 24V/7A Max
Suggestion Solar Cells Max Voltage / Open Circuit Voltage Maximum Current	100~130W 17~18.5V / 21~23V 5~8A	110~135W 17~18.5V / 21~23V 5~8A	120~140W 17~18.5V / 21~23V 5~8A
DC to DC for Device	DC 11.5V~14.4V +-3% 6A Max		
DC to DC for Battery	14.4V +-3% 3~4.8A Max		
Transform Efficiency	90%~ Electronic MPPT Effectiveness		
Protection	Solar collection energy online type uninterruptible operating system power failure does not interrupt (monitor system will not be black screen) Solar cell 12V~28V automatic input voltage detection Cloudy collection of solar cells can be charged *		



	Solar cell reverse charge protection Built-in Li-Fe battery BMS/PCM voltage balance management Battery charge/discharge protection ' would not be either battery core fault ' affect the operation of ontology and its Automatic detection of abnormal voltage or battery status and fault exception of battery charging protection * Battery positive and negative polarity of the anti-protection Low-voltage zero-power battery protection * Balancing charge/discharge protection * Charge/discharge limit current protection Battery overcharge protection Over discharge protection Over temperature protection Input power overcurrent protection Input power supply over voltage protection Short circuit protected Fuse		
Support Battery Type	C-LiFePO4 Lithium Batteries		
Battery Capacity	34.8Ah @ 12.8V (445 WH)	40.2Ah @ 12.8V (515 WH)	46.4Ah @ 12.8V (594 WH)
Battery Charge Mode	CCP/CVP MCU Control		
Battery Charge Voltage	14.4V +- 3%		
Battery Charge Float Voltage	13.6V +- 3%		
Battery Cut-off Discharge Voltage	11.5V +- 3%		



Battery recovery discharge voltage	12.4V +- 3%		
Standard Charge Current	3.6A		
Max. Charge Current	7A		
Standard Discharge Current	3A		
Max. Discharge Current	6A		
Solar Cell 80W @ 6hrs @ 360MJ/m2 Charging Time @95% Capacity	Non discharge 3.5hrs On line discharging 4.5hrs	Non discharge 4hrs On line discharging 5.5hrs	Non discharge 4.5hrs On line discharging 6hrs
Battery Cycle Life (80% Capacity) 0.2C Charging 0.5C Discharge	@ 25°C 2000 Times @ 45°C 1600 Times @ 50°C 1200 Times @ 60°C 550 Times @ 60°C 720 Times 70% Capacity		
Industrial Housing & Connector	Aluminium Radiating Airtight Housing IP67 M12 Connector and Solar Panel Connector		
Connector Type	1.Enter the solar DC power supply: Input DC 6~28V M12 Female 2.Output: 12V M12 Female to DC Jack Female 3.Solar Panel Connector Cable Tyco. 1394462-4 (Male) & Tyco. 6-13994461-2 (Female)		
Operating Temperature (Discharge)	-20°C ~ 60°C 20~40°C Battery Capacity:100% -10°C Battery Capacity : 60% -20°C Battery Capacity : 48%		
Charging Temperature	-30°C ~ 60°C		



Storage Temperature	-20°C ~ 40°C		
Rel. Humidity	10~95%RH		
Storage Time	6 months (Stored charge once every three months) (Before the Use, please First Charge)		
Dimension	209(L)x139(W)x210mm(H)		
Weight	3.9Kg (Box 5Kg) (2Pcs/Carton)	4.6Kg (Box 5.6Kg) (2Pcs/Carton)	6.2Kg (Box 7Kg) (2Pcs/Carton)
LED Indicator	1.Input AC power LED-red full light (Battery capacity more than 95%) 2.Input AC power LED-red flash light (Battery is charging) 3.Battery is charging, Insert the 12V device load, LED-green flash light 4.Battery non charging, Insert the 12V device load, LED-green full light		
Housing	IP67		
Approvals	. CE, FCC		
Installation	1.Street lamp pole mount 2.Upright pole mount 3.Wall mount installation		
Warranty	12 months		

Ps 1: Battery Capacity +-5%

Ps 2: Product specifications change, without notice, consultation with agent or dealer before buying the latest specifications