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Sunwave Communications

Wireless network security solution - SCUTARII

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CONTENTS

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Evolution of blocking technology

Traditional blocker

high power, white noise suppressing

Cube

signaling intelligent blocking

Receive public network signal,

synchronize signal and block signal

Comparison of blocking technologies

	High power suppressing	Signaling intelligent blocking
		
effectiveness	poor blocking experience of 4G and 5G. No effect on SA 5G signal blocking	premium effectiveness of blocking all signal, support blocking all of 5G signal
coverage precision	serious overflow	precise perimeter controlling
electronic radiation	one unit transmit power:20W	per channel transmit power:2W
interference	No serious interference on uplink to base station	few interference on uplink
monitoring platform	None	support

Scutarii Portfolio

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Desktop blocker

Cube 1.0

Cube 2.0

Managed Access System (MAS) Series

Signaling Unit - SU

Access Unit - AU

Expansion Unit - EU

Remote Unit - RU

Catching Unit-CU

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2 Cube product

Cube2.0

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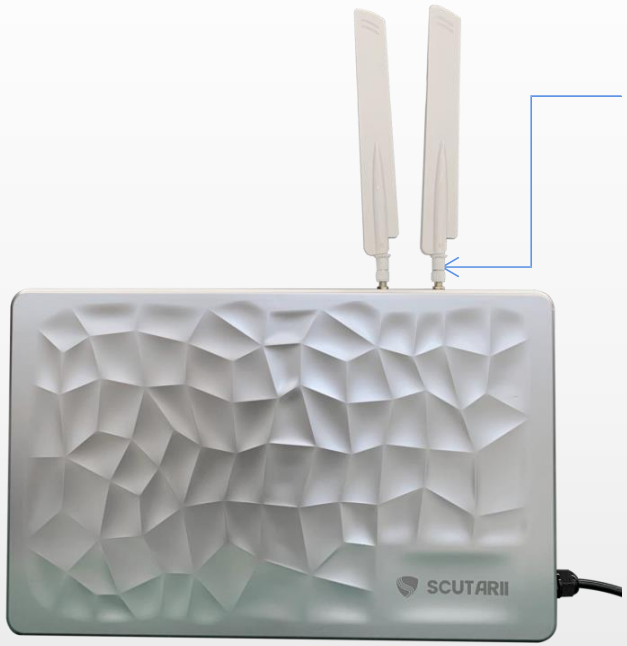
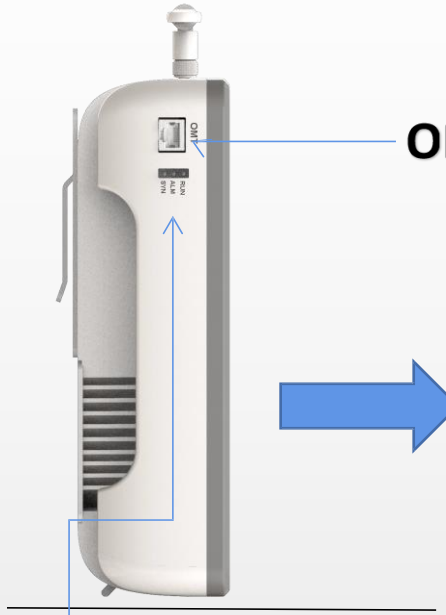


SIGNAL, receive signal, install the receiving antenna



OMT,Testing port

blocking direction

Interface: SIGNAL/OMT

Indicating light: RUN/ ALM/ SYN

RUN ,Operation indicator
ALM, The indicator of warning
SYN ,Synchronous status indicator

Characteristic “DLPP”

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Downlink blocking

Control signaling in downlink.

None of interference in uplink to base station

Low radiation

Transmit power is 2w at per channel

Precise perimeter

The blocked boundary does not exceed 5 meter

Plug and play

Accurate synchronization, multiple units are collaborated, without interference to each.

Self adapt environment.

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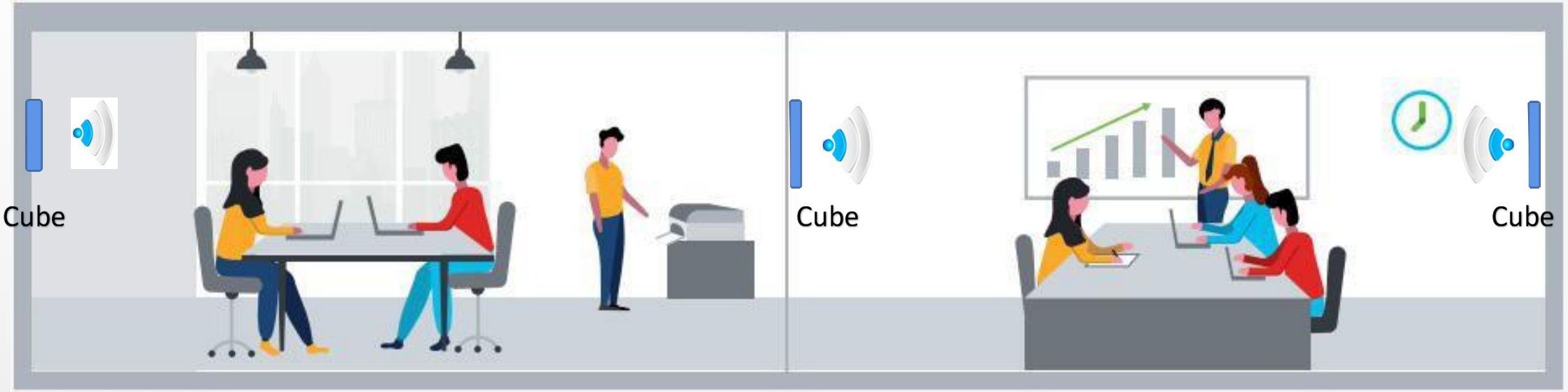
Working mode & placement



Cube is placed at the height of 1.8m to 2.2m

Multi-unit are collaborated, without interference between each one. According to the area of blocking signal decide the number of deployed Cube.

Specification

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Cube-LS

Band

2G/3G/4G/5G,WiFi,Bluetooth

frequency is customized

Coverage

100 ～ 200 square meter

(RSRP:-85dbm 150 square meter)

Transmit Antenna

Built-in directional antenna

MTBF

≥50000 Hours

IP rating

IP20

Working temperature

-5℃ ～ +40 ℃

Weight

6.6KG （without accessories）

Size

410mm(L)*260mm(W)*80mm(H)

Installation

wall mounted

Power supply

AC power, input:90-264V

Management platform (OMT)

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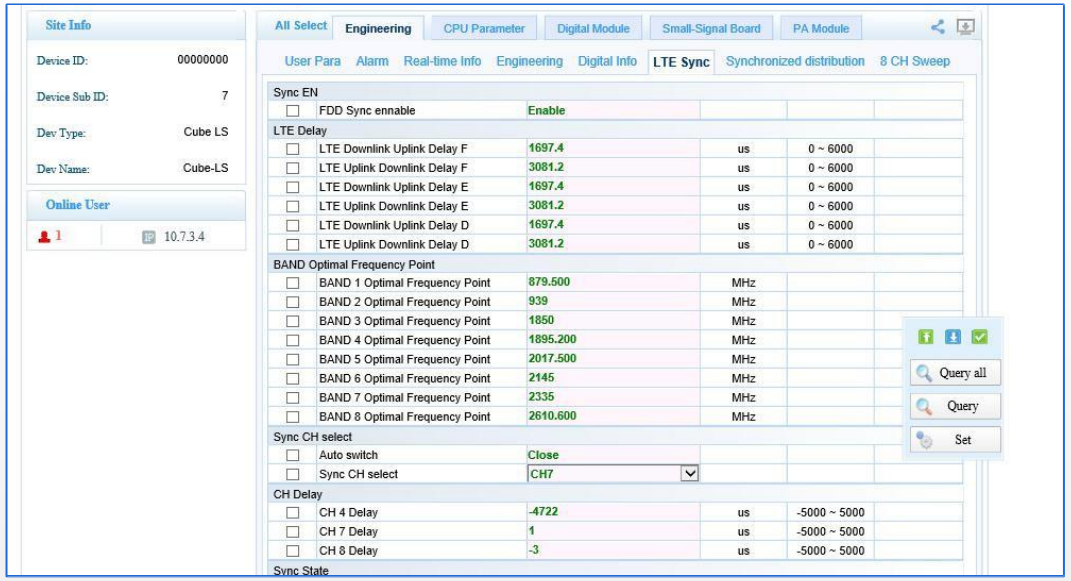

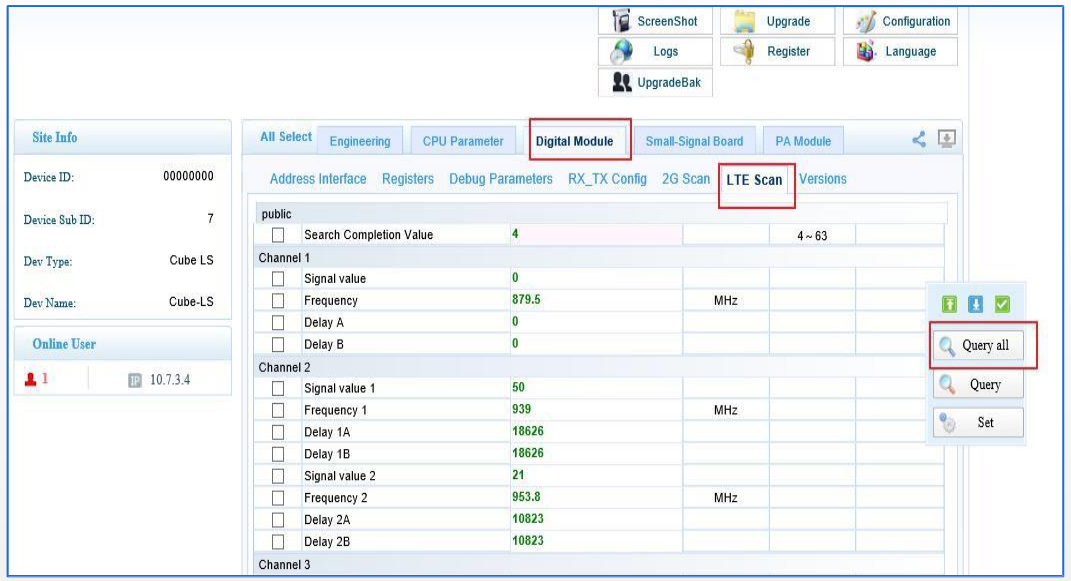

operation management

channel-switch

parameter setting

fault warning

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3 MAS solution in prison

What is MAS

The Managed Access System (MAS) is a blocking signal system which denies service of the radio spectrum to the cell-phone users within range of the jamming areas.

The Scutarii MAS Distributed Intelligent Signal Blocking System support multiple network operators' bands with various power configurations to address blocking mobile cellular signal at any venue with innovative technology of signaling downlink blocking.

About the system

The system can effectively block the illegal mobile phones communication within the supervision area. Also, it can detect information of illegal mobile phone when it is working.

MAS System Component

SU

MAS signaling unit

Receive the public network signal, and generate the blocking signal after processing.

AU

MAS access unit

As the control centre of MAS system. access to SU and CU.

EU

MAS expansion unit

Each unit can connect 8 remote units.

RU

MAS remote unit

signal amplified and sent to the antenna feed system.

CU

MAS catching unit

Catch illegal phones

MAS System Architecture

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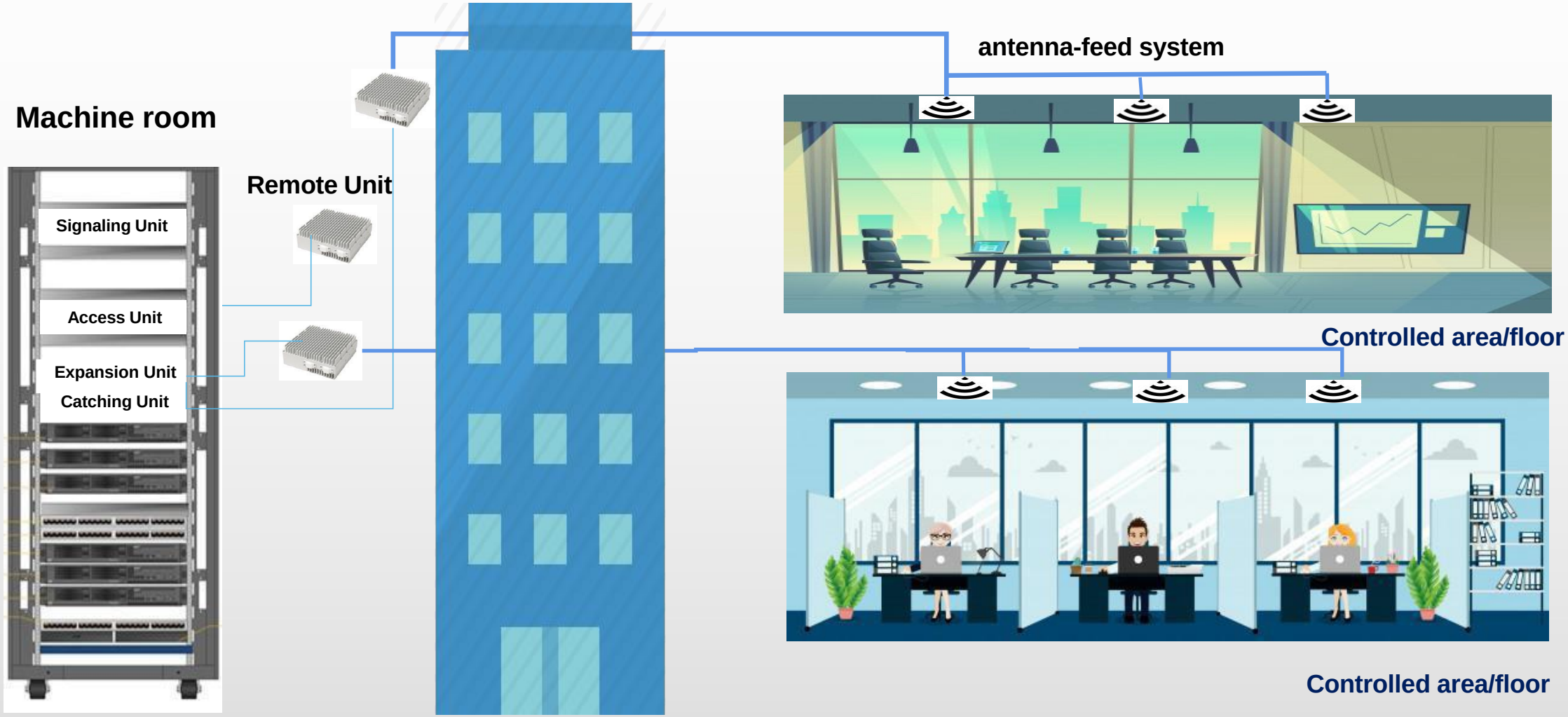

Signaling Unit

- Accesses different bands by external POI
- Supports up to 4 SU per system
- Supports up to 4 individual Bands per SU
- Supports IP65 ingress protection
- Integrated OMT

SU - Signaling Unit

Receive the public network signal, and generate the blocking signal.

General Specifications	
Size	400 x300 x 125 mm
Weight	16 KG
Maximum Power	60W
Operating temp	-40℃ to +50℃ / -40℉ to +122℉
Cooling	Passive
System delay	Up to 10.00μs
Noise Figure	6dB typical @ Max. Gain
Bandwidth per System	≤280MHz (in each direction)

Access Unit

- 4 x Optical Interfaces to EU/Rus
- 4 x Duplex Inputs per AU-AC
- 4 x AU-AC Modules per AU
- Integrated OMT & SNMP

AU - Access Unit

The AU receives analog RF or CPRI signals, conditions then converts to WDM and transmits optical signals to EUs or RUs.

General Specifications

Size	440 x329 x 44 mm
Weight	8 KG
Maximum Power	80W
Operating temp	-10℃ to +50℃ / 14℉ to +122℉
Cooling	Passive

Expansion Unit

- 6 x Optical ports to EU/RUs
- 6 x Inbound RJ45 Ethernet ports
- Not compulsory element

EU - Expansion Unit

The EU provides IP back-haul connection to all RUs, enabling Wi-Fi integration and other Gigabit Ethernet services deployed in a heterogeneous network environment.

General Specifications

Size	440 x220 x 44 mm
Weight	5 KG
Maximum Power	50W
Operating temp	-10℃ to +50℃ / 14℉ to +122℉
Cooling	Passive

Remote Unit-customized

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RU - Remote Unit

The RU converts WDM signal to RF then transmits at the relevant 3GPP band, and receives analog RF signal, conditions using digital filters, converts to WDM and transmits signal to EU or AU.

- Wideband Support (600MHz – 3600MHz)
- 2 x 43dBm (20 Watts) RF Modules per Chassis
- Up to 80MHz per RF Module
- Cascade up to 5 x RU on 1 fibre core
- 2 x 10GBps SFP+ Interfaces to/from EU or RU
- 1 x RJ45 Socket for Gigabit Ethernet service
- Integrated OMT and SNMP, via RJ45 socket
- Converts Digital Optical to Analog RF

General Specifications	
Size	400 x300 x 125 mm
Weight	16 KG
Maximum Power	250W
Operating temp	-40℃ to +50℃ / -40℉ to +122℉
Cooling	Passive
System delay	12μs
Noise Figure	6dB typical @ Max. Gain
Bandwidth per System	≤280MHz (in each direction)

Catching Unit

CU - Catching Unit

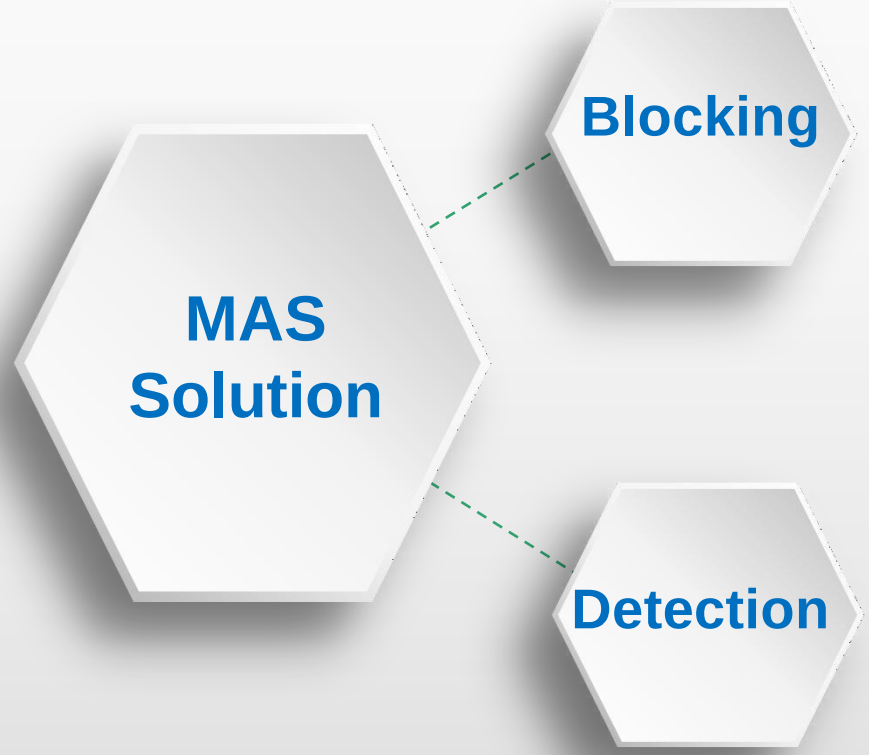
The CU detects illegal phones, including illegal calls, messages and invasions regularly .

General Specifications

Maximum Power	250W
Operating temp	-40℃ to +50℃ / -40℉ to +122℉
Cooling	Passive
System delay	12μs
Noise Figure	6dB typical @ Max. Gain
Bandwidth per System	≤280MHz (in each direction)

Main functions of MAS Solution

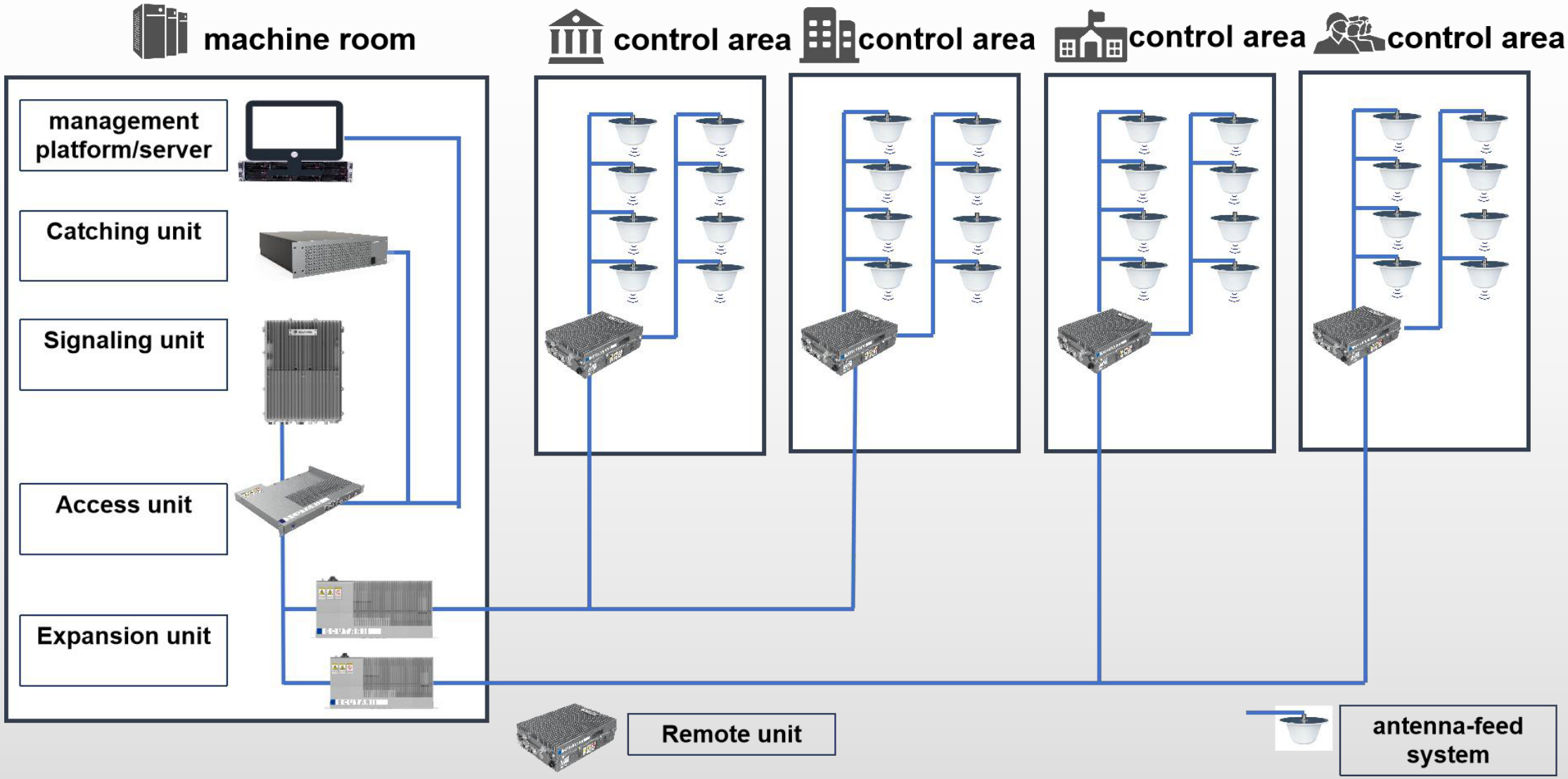
MAS has two main functions, one is intelligent blocking, another one is detection function.



A solution with SU, AU, EU and RU works on ***blocking*** module.

A solution with SU, AU, EU, RU and CU works on ***detecting*** module.

System Architecture



Comparison of blocking technologies

	High power noise suppressing	Signaling intelligent blocking
Basic theory	Transmit high power radio signal in whole band	Based on signal blocking technology, low power, multiple point transmit
effectiveness	poor blocking experience of 4G and 5G signal No effect on SA 5G signal blocking	premium effects of blocking all signals, support blocking all kind of 5G signal
coverage precision	critical leaking	precise controlling
self-adaptive capacity	None	real time detecting public network, self adapting
electronic radiation	transmit power:2-100W high radiation	transmit power: 30mw lower radiation less than phone's
system reliability	redundant active equipment, lower reliability, high maintenance cost	adopt passive distributed architecture design, with remote management and control functions, high system reliability

Intelligent blocking feature

- **Full standard**

2G, 3G, 4G, 5G,WiFi, support global band

- **Low-cost**

exclusive "signaling level shielding" patented technology,transmit power is 30mw~50mw, lower than phone.

- **Downlink blocking**

Control signaling in downlink.None of interference in uplink to base station

- **Precise controlling**

Based on carrier-Grade distributed architecture, precise controlling method instead of non-divergent transmission, achieve 5 meter accuracy range.

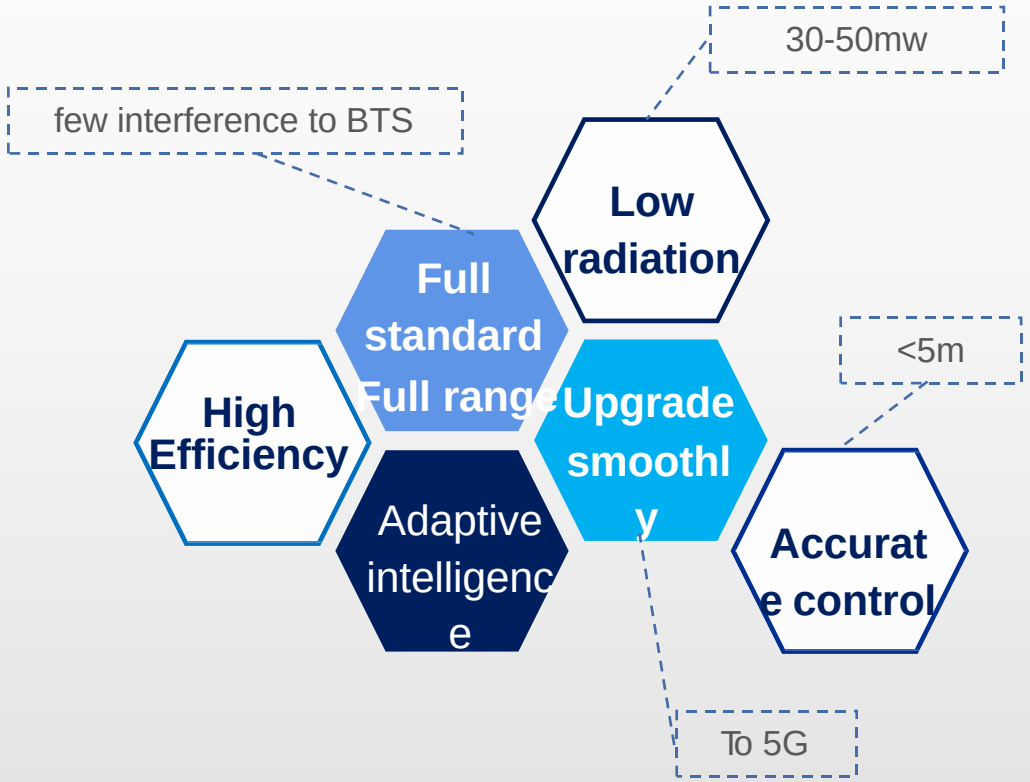
- **Self-adapting**

The system can automatically detect changes of public network parameters. and synchronously adjust its own parameters to ensure the reliability of the system.

- **Fusion extension**

The system adopts a digital architecture, can be flexibly set and easily integrated with other functions such as extended detection and private network.

Intelligent blocking feature



- Innovation in signaling level control, distributed multi-point launching
- Low power, low radiation, energy saving
- Power adjustable, accurate control in perimeter
- Full standard, full region, and no blind spot
- remote maintenance platform
- self-adapting, upgrade smoothly

The first ultra-low power signaling level shielding technology in China [national patent]

Key Performance

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100,000

MTBF

Mean time between failure more than 100,000 hours

95%

Blocking effect

Almost 95% whole area can be covered by blocking radio frequency signal

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Precise perimeter

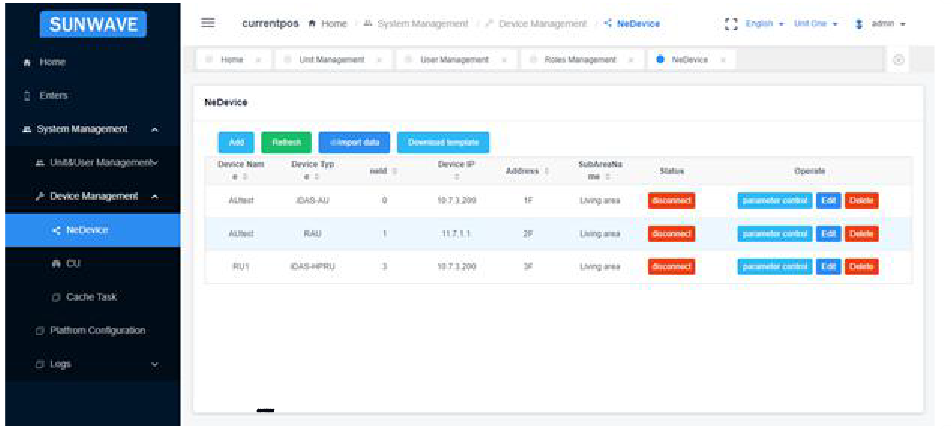
The blocking boundary does not exceed 5 meter. cannot disrupt surroundings

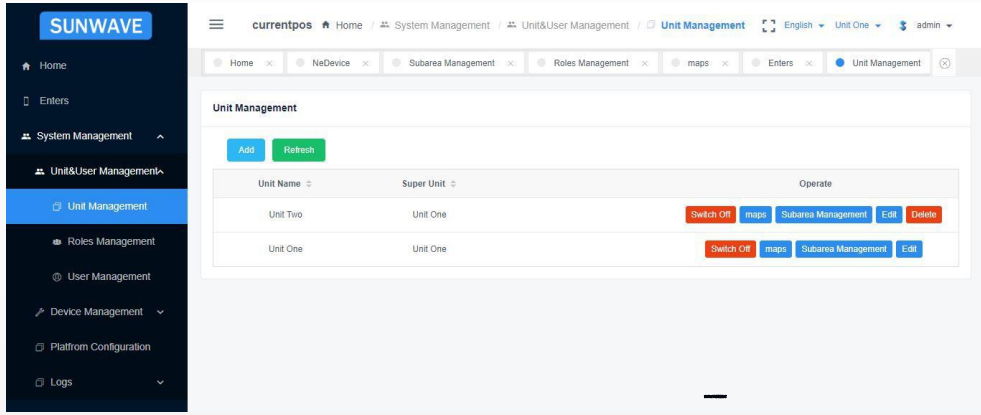
50%

Lower RF power

power consumption is 50% lower than similar products.

Management platform of MAS





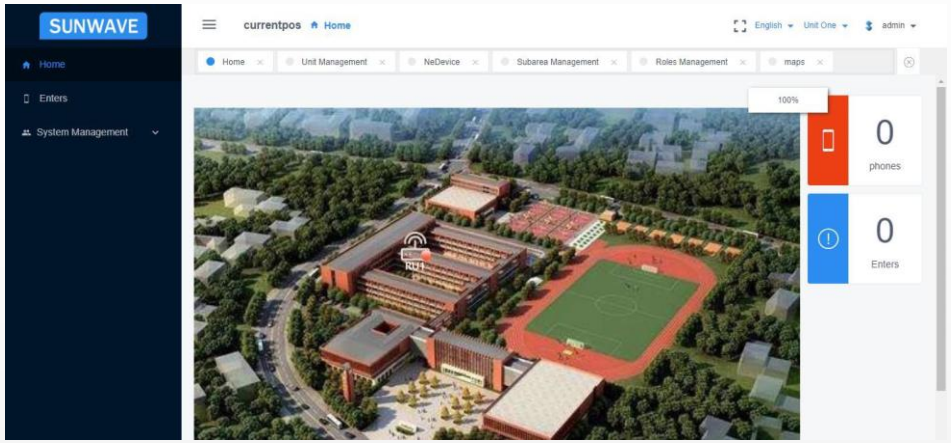
operation management

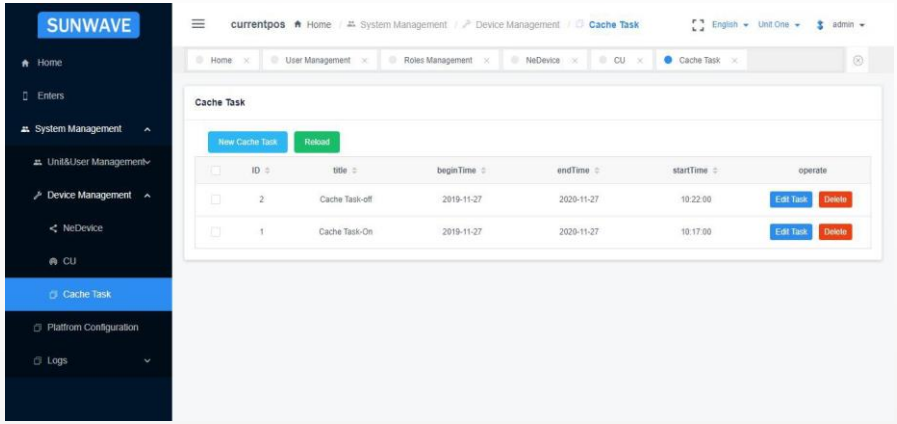
time-switch

parameter setting

fault warning

Detecting function platform





Detecting information of illegal phone

- IMSI code
- Invasion time

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4 Anti-UAV defence system

Anti-UAV defence system portfolio

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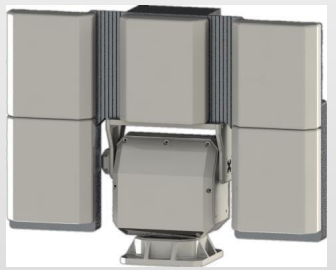
detecting+jamming

Localisation(radar detect)

identify+tracking



defeat

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Anti-UAV defence system

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RS-LY_Z0002_GFFT5000 intergrate with array antena, jamming equipement, signal processing. Automatically， real-time detect UAV, classify UAV, and defeat UAV.

frequecny	ISM 2.4G/5.8G
distance	detecing distance≥5km defeat distance ≥1km
decting sensitivity	≥ -95dBm(25kHz)
decting airspace	360° whole airspace

black list white list	classify electronic figureprint
precise defeat	support
working temperature	-20°C~+65°C
IP rating	IP65

Anti-UAV defence system

SUNWAVE

RX-LY-GAX1800, photoelectric detection, Video Tracker, featuring both a long range camera and a high sensitivity Thermal Imager (TI), along with state-of-the-art video tracking technology, is able to TRACK the UAV and classify the target.

detecting distance	Optical: 2km Infrared: 1.8km
Azimuth coverage	360° consecutive rotate
Elevation adjustment	-30°~ +60°
ratio	optical：1920*1080 camera：1920*1080 thermal imager：640*512

laser distancer	distance： ≥4km accuracy： ±5m， 95%
working temperature	-40℃～+55℃
intelligent detection	automaticlly detect and lock target. And work with controller to track target by optical and thermal image.

Anti-UAV defence system

The operator is then able to make a timely and informed decision to use the Enterprise Control System's smart RF inhibitor to selectively interfere with the transmit channels(wifi) on the UAV allowing the system to DEFEAT the UAV. The smart RF inhibitor uses directional antennas.

frequency	1.5GHz/2.4GHz/5.8GHz/800GHz/900GHz/1.2GHz
distance	> 2km
rotate range	horizon range：0°～360°，vertical -15°～65°
rotate speed	range：0.01～36°/S，phase：0.01～15°/s
transmit power	each band ≥50W
install	protable /mounting
power supply	AC100-240V/50-60Hz；24V AC

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5 user cases

Case of cell phone blocking in British prisons

Project brief

The illegal cellphone using in prisons is worse and worse nowadays, especially in countries like UK. There are 8 buildings and 1 conference hall in a prison in England, each floor covers an area of 1000 m^2, which requires all signal blocked in the whole area. The traditional way, using noise interference cannot solve the problems apparently.

Sunwave Solution

This MAS solution consists of 1 SU, 3 AUs, 10 EUs and 78 HPRUs and a set of antenna system to shield signal. The system has been running steadily and reliably.

The Scutarii Managed Access System (MAS) is a flexible platform supporting different technology standards across multiple network operators' bands with various power configurations to address any venue with innovative technology.

Key contribution

- The solution enhances the security of prison
- It reduced 30% of cost in signal control in prison while the efficiency increased from 30% to 99%.

Case of Prison Administration Project in Australia

Project brief

The situation in Australia is serious as well since more and more illegal activities occur in prisons there, such as illegal phone calls and Drones dropping things to prisoners. There are several buildings in a prison in Sydney, each floor covers an area of 800 m². It requires all signal can be blocked in the whole area.

Key Contribution

By using MAS, the illegal cellphone usage was completely controlled while staffs working at the prison could use the phone. It reduced **70%** of cost in signal control in prison.

Sunwave Solution

The entire system consists of AU, EU, SU and HPRU; since the blocking area was quite large. The total number of devices are over one hundred. There are the main components:

AU: 6 pieces

EU: 6 pieces

SU: 6 pieces

HPRU: 119 pieces

The MAS solution provided a way for the prison to detect illegal phone use as well as a full shielding in entire area.

Case

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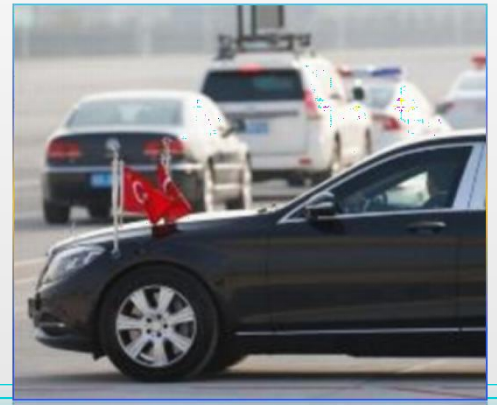
APEC
CHINA 2014

G20 2016 CHINA



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