

TMR-5002

EN50155 Multifunction VPN Router + up to 2 LTE 4G + 2 serial ports + 2 Gigabit X-coded Ethernet (incl.1 PD) for Load Balancing VPN, Protocol Gateway, Storage; WVinput; IP65/54**

- Up to 2xLTE 4G module(4SIMs) + 2xGigabit X-coded ports(incl. 1PD)
- Support LTE Cat 6 (APAC & EUNA models) or Cat 12/9/13 (WW model)
- Up to 2 concurrent modem for 3G/4G LTE Link & GPS
- Built-in 2 serial ports with 2.5K isolation(RS422/RS485) or w/o isolation(RS232)
- VPN router for Multi-site VPN, OpenVPN, L2TP over IPsec, IPsec, PPTP**, L2 over GRE, IPGRE
- Load Balancing built-in 5 mechanism
- Optional EMMC Flash storage on-board**
- Support NAT and Firewall
- Support Modbus gateway on serial ports
- Galvanic isolation on WV model from 16.8V~137.5V input
- Built-in environmental monitoring for router inside info with voltage, current, temperature; LTE graphic signal strength
- Editable login page of captive portal for hot-spot application
- USB port for backup, restore the configuration file and upgrade firmware; Dual image firmware*
- IP 65 /54 Aluminum housing for best heat dissipation and preventing moist ingress
- EN50155/61373/45545 verification for railway application



OVERVIEW

Lantech TMR-5002 series is a next generation EN50155 multi-function VPN router up to 2x LTE modem + 2x Gigabit Ethernet(incl.1 PD)+ 2 serial ports that supports advanced function of VPN, Load-Balancing, EMMC Flash Storage**, Protocol gateway(Modbus), Storage**, and LTE dual SIM fail-over for on-board / onboard-to-ground applications. The dual core CPU with 1.6GHz + 256M flash enables the router to multi-task smoothly.

Dual concurrent LTE design 4G/3G for load-balancing

With dual LTE module design (2L model), 4 SIM card slots, TMR-5002 can allow auto-swap, failover & failback between multiple service providers for real non-stop connection. With concurrent LTE modules, it can also allocate bandwidth by " Load Balancing with 8 schemes between multiple WANs.

Optional EMMC Flash storage**

The optional EMMC flash storage on router can offer 8G/16G/32G capacity.

Load Balancing with 8 mechanism for multi-WANs

(premium license)

TMR-5002 supports Load Balancing for LTE / WAN connections. There are eight schemes for Load Balancing function:

Pack	Algorithm	Description
Basic Package	Fixed	Manually route by traffic type through fixed WAN link.
	Failover	Routes connections through preferred WAN link while others stand-by. Sequentially activate another link if preferred link fail occurs. Once failover will not failback until link loss.
	Priority	Routes connections through preferred WAN link as primary while others follow by. Ex. Wi-Fi client>LTE>others
	Weighted Round-Robin	Evenly distribute the traffic over all working WAN links in circular order according to the specified weights.

	Custom Route	Routing through the selected WAN for each specific traffic, ex: TCP/UDP port number and IP address.
Full Package** (incl. basic package)	Sticky Session*	Binding all connections in an application session to particular WAN link to ensure all connections in the session are routed to the same WAN link, that is suitable for security services like online payment etc.
	Smallest Load*	Routes connections through the WAN link with highest free bandwidth ratio. The ratio = 1 - (traffic load / the capability of a WAN link). The traffic load could be defined by downstream, upstream or total traffic
	Fastest*	Routes connections through the WAN link with lowest latency time.

2 port serial connection, Modbus gateway

It builds in 2 port serial connection for RS232 or RS422,RS485 in which RS422/RS485 has 2.5KV isolation protection.

The built-in Modbus gateway can convert Modbus RTU/ASCII to Modbus TCP for device control.

VPN and firewall

Besides traditional VPN peer to peer tunneling, TMR-5002 support latest Multi-Site VPN function that is an efficient way for mesh tunneling. The registration is under cloud service and encrypted by SSH makes the connection easy and safe.

It supports Multi-Site VPN, OpenVPN, L2TP over IPsec, IPsec, PPTP**, L2 over GRE, IPGRE, and NAT for various VPN applications.

The built-in Layer-4 firewall includes DDoS, IP address filter / Mac address filter / TCP / UDP port number.

DIDO for alarm & email notice; Event log; Remote Web control

2 sets of DIDO function can support additional high/low physical contact for designate applications besides Port /

Power events, for example, DIDO function can trigger alarm if the router was moved or stolen. In case of events, the IWMR-3002 will immediately send email and trap.

When the router is at remote area with limited access, Web control can help to get router status or remotely reboot by Web.

Wide range dual input voltage from 16.8-137.5V (WV model)

The TMR-5002 is able to work from dual 16.8V ~137.5V DC input (WV model) that is particular good for vehicle, rail train, depot etc applications.

Environmental monitoring for inside router info& alerting; LTE signal strength

The built-in environmental monitoring can detect router overall temperature, voltage, current where can send the syslog, email** when abnormal.

The graphic LTE signal strength shows connection status at a glance.

USB port for back up, restore configuration and upgrade firmware; Dual image firmware*

The built-in USB port can upload/download the configuration through USB dongle for router replacement

It supports dual-image firmware* to choose which one to start.

Editable login page of captive portal

The TMR-5002 supports editable captive portal function that allows administrator to force end-users redirect to authentication page.

Ruggedized EN50155 design and FCC/CE, E-marking certificate**

The TMR-5002series is verified with EN50155,61373,45545 standard with IP65/54 housing. It passed tests under extensive Industrial EMI and environmental vibration and shocks standards. With CE & FCC radio certification for LTE and E-marking** certificate, the TMR-5002 is best for outdoor community, vehicle, power substation, process control automation etc. For more usage flexibilities, TMR-5002 supports operating temperature from -40°C to 65°C.

FEATURES & BENEFITS

- Built-in two Gigabit ports X-coded incl. 1 PD; 1LAN+1WAN or 2LAN
- 6 xSMA/QMA** type connectors for LTE(2L model),
- HTTP/HTTPS/Telnet/SSH & Administration access
- Support IPv6 & IPv4 protocol
- Dual concurrent LTE 4G/3G design (2L model)for auto-swap/failover/failback between multiple ISPs for continuous service (four SIM card slots)
- GPS/ GLONASS (built-in LTE module) connection
- EMMC-FLASH storage**8/16/32G

- Load Balancing supports 8 mechanism between multiple WANs

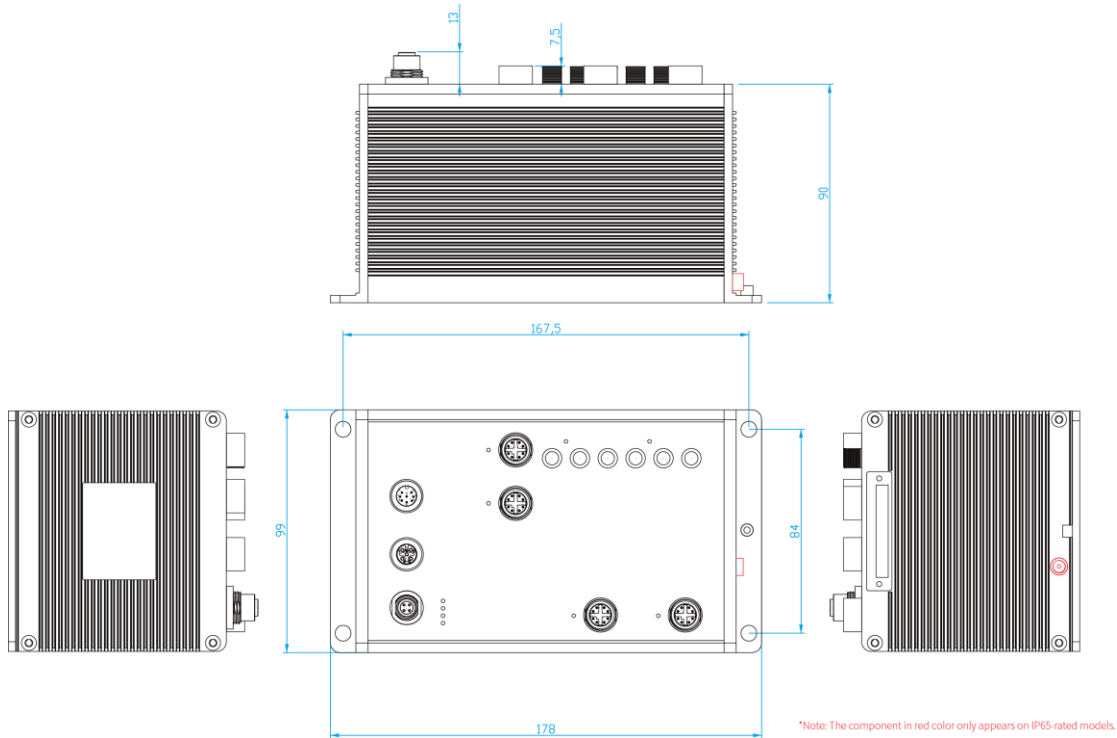
Pack	Algorithm	Description
Basic Package	Fixed	Manually route by traffic type through fixed WAN link.
	Failover	Routes connections through preferred WAN link while others stand-by. Sequentially activate

		another link if preferred link fail occurs. Once failover will not fallback until link loss.
	Priority	Routes connections through preferred WAN link as primary while others follow by. Ex. Wi-Fi client>LTE>others
	Weighted Round-Robin	Evenly distribute the traffic over all working WAN links in circular order according to the specified weights.
	Custom Route	Routing through the selected WAN for each specific traffic, ex: TCP/UDP port number and IP address.
Full Package** (incl. basic package)	Sticky Session*	Binding all connections in an application session to particular WAN link to ensure all connections in the session are routed to the same WAN link , that is suitable for security services like online payment etc.
	Smallest Load*	Routes connections through the WAN link with highest free bandwidth ratio. The ratio = 1 - (traffic load / the capability of a WAN link). The traffic load could be defined by downstream, upstream or total traffic
	Fastest*	Routes connections through the WAN link with lowest latency time.

- Built-in 2 x serial ports(RS232/RS422/RS485)
- Serial port with 2.5KV isolation on RS422/RS485
- Supports 2DI / 2DO(Digital Input / Output)
- Support Multi-Site VPN for mesh tunneling as well as

- Open VPN, L2TP over IPsec, IPsec, PPTP**, L2 over GRE , IPGRE and NAT for secured network connection
- The built-in Layer-4 firewall includes DDoS, IP address filter / Mac address filter / TCP/UDP port number
 - NAT/DMZ/Port Forwarding
 - Built-in Modbus gateway converting Modbus RTU/ASCII to Modbus/TCP
 - Radius Authentication, EAP-TLS, EAP-TTLS, PEAP
 - Event alerting by Syslog, SNMP Trap, Email, Relay ; Permanent local log rotation / Maxi 1K records
 - Remote Web control to get status or re-boot by Web
 - Built-in RTC to keep track of time always
 - Support SNTP to synchronize system clock
 - Support LLDP discovery protocol
 - Support DHCP Server and Client
 - Built-in environmental monitoring for system input voltage, current and ambient temperature; Able to set alert when abnormal
 - LTE signal strength
 - Firmware upgradeable through TFTP/HTTP
 - Configuration backup and restoration
 - Supports editable configuration file for system quick installation
 - USB port to upload/download configuration by USB dongle
 - Dual image firmware*
 - Support editable captive portal login page
 - IP 65/54 housing for water proof environment
 - Wall-mount installation
 - EN45545-2 Fire & Smoke, EN50155 and EN61373 shock/vibration verification
 - Operation temperature -40~65C

DIMENSIONS (unit=mm)



SPECIFICATION

Cellular Interface		Cat 9: 450 Mbps Uplink: Cat 13: 150 Mbps
Location Solutions	GPS, Glonass (EU/Americas) GPS, Glonass, Beidou, Galileo (APAC model only)	Software
Band Options	Asia-Pacific (APAC model) LTE = B1, B3, B5, B7, B8, B18, B19, B21, B28, B38 (TDD), B39 (TDD), B40 (TDD), B41 (TDD) DC-HSPA+/ HSPA+/ HSPA/ UMTS = B1, B5, B6, B8, B9, B19 Europe & North America (EUNA model) LTE = B1, B2, B3, B4, B5, B7, B8, B12, B13, B20, B25, B26, B29, B30, B41 (TDD) DC-HSPA+/ HSPA+/ HSPA/ UMTS = B1, B2, B3, B4, B5, B8 World Wide (WW model) LTE = B1, B2, B3, B4, B5, B7, B8, B9, B12, B13, B18, B19, B20, B26, B28, B29, B30, B32, B41 (TDD), B42 (TDD), B43 (TDD), B46 (TDD), B48 (TDD), B66 WCDMA = B1, B2, B3, B4, B5, B6, B8, B9, B19	
Data Rates – LTE	Asia-Pacific (APAC model) Downlink (Cat 6): FDD: 300 Mbps TDD: 222 Mbps Uplink (Cat 6): FDD: 50 Mbps TDD: 26 Mbps Europe & North America (EUNA model) Downlink (Cat 6): FDD: 300 Mbps TDD: 222 Mbps Uplink (Cat 6): FDD: 50 Mbps TDD: 26 Mbps World Wide (WW model) Downlink: Cat 12: 600 Mbps	
		IPv6/4 Present Login Security Supports IEEE802.1x Authentication/RADIUS Optional Train Wireless Carriage Coupling for Auto wireless Coupling Access Security HTTP/HTTPS/Telnet/SSH & Administration; SNMP* v1/v2/v3 access for authentication via MD5/SHA(v3) and Encryption via DES/AES(v3) Protocol PPPoE Client, DHCP server/client, Adjustable MTU, Port forwarding (NAPT), DMZ; NAT, SNTP, Firewall(Firewall(DDoS; IP address filter / Mac address filter / TCP/UDP port number), VRRP**, DDNS* Management SNMP* v1,v2c,v3/ Web/Telnet/CLI
		Load Balancing 8 schemes for multiple WAN
		Basic Package
		Fixed Manually route by traffic type through fixed WAN link.
		Failover Routes connections through preferred WAN link while others stand-by. Sequentially activate another link if preferred link failure occurs.
		Priority Routes connections through preferred WAN link while others stand-by. Sequentially activate other links if overflow occurs.
		Weighted Round-Robin Evenly distribute the traffic over all working WAN links in circular order according to the specified weights
		Custom Route Routing through the selected WAN for each specific traffic ex: TCP/UDP port number and IP address.
		Full Package** incl. basic package
		Sticky Session* Binding all connections in an application session to particular WAN link to ensure all connections in the session are routed to the same WAN link , that is

Smallest Load*	suitable for security services like online payment etc. Routes connections through the WAN link with highest free bandwidth ratio. The ratio = 1 - (traffic load / the capability of a WAN link). The traffic load could be defined by downstream, upstream or total traffic	DIDO 3KV isolation Input power 1.5KVA isolation
Fastest*	Routes connections through the WAN link with lowest latency time.	DI/DO 2 Digital Input (DI) : Level 0: -30~2V / Level 1: 10~30V Max. input current:8mA 2 Digital Output(DO): Open collector to 40 VDC, 200mA
Timer	Built-in Real Time Clock to keep track of time always(RTC)	EMMC Storage** 8/16/32 GB
Discovery	IEEE 802.1ab Link Layer Discovery Protocol (LLDP)	LED Indicators
SNMP trap	Device cold / warm start Port link up / link down DI / DO high / low	Power & system indicator Per unit: Power 1 (Green), Power 2 (Green), P-Fail (Red) , System Ready(Green), Serial1/2(Green)
Environmental Monitoring	System status for input voltage, current , ambient temperature to be shown in GUI and sent alerting if any abnormal status	10/100/1000Base-T(X) port indicator Link/Activity (Green), Speed (Yellow)
Graphic signal display	Graphic LTE signal strength & TX / RX rate display	SIM Green for Link/Act
Remote Web control	To reboot or get status of router by Web	GPS Green for Link/Act
Maintenance	Firmware upgradeable through TFTP/HTTP	Fault Red: Ethernet link down or power down
Configuration backup & restore	Supports text configuration file for quick system installation USB port to upload/download configuration and upgrade firmware by USB dongle	Fault contact
		Relay Relay output to carry capacity of 1A at 24VDC
		Power
		Input power Dual DC input, 16.8VDC~137.5VDC for (WV model)
		Power consumption (Typ.) 18 Watts
		Physical Characteristic
		Enclosure IP 65/54 aluminum case
		Dimension 178 (W) x 99 (D) x 103 (H) mm
		Weight 1000g
		Environmental
		Storage Temperature -40°C ~ 85°C (-40°F ~ 185°F)
		Operating Temperature -40°C ~ 65°C (-40°F ~ 149°F)
		Operating Humidity 5% to 95% Non-condensing
		Regulatory approvals
		EMC FCC Part 15 Class A, EN55032 , EN55024
		EMS EN61000-4-2 (ESD), EN61000-4-3 (RS), EN61000-4-4 (EFT), EN61000-4-5 (Surge), EN61000-4-6 (CS), EN61000-4-8, EN61000-6-2
		Radio Frequency EN301 489-1, EN301 489-17, EN301 489-19, EN301 489-52, EN300 440, EN301 893, EN300 328, EN301 908-1, EN303 413, EN62311
		Safety EN60950 (LVD), AS60950 (LVD)
		Stability Testing EN61373 (Shock & Vibration)
		Verifications & report EN50155, EN50121-3-2, EN50121-4 verification EN45545-2 R13/R22/R23/R24/R25 (EN ISO 4589-2, EN ISO 5659-2, NF X70-100-1 & 2) Fire & Smoke verification
		MTBF 565,049 Hrs (IEC62380 standards)
		Warranty 5 years
		*Future Release **Optional
Physical Ports & System		
Connectors	10/100/1000T: 2x ports M12 8-pole X-coded with Auto MDI/MDI-X function (one port PD; 1LAN+1WAN or 2LAN) USB/Console connector: 1 x M12 8-pole A-coded DIDO : 1 x 5-pole terminal block Power Input connector : 1 x M12 4-pole A-coded Serial connector : 2 DB9 SIM card slots : 4(2L) or 2(1L) 2L model SMA/QMA** connector for LTE: 4 (female) SMA/QMA** connector for GPS: 2 (female) 1L model SMA/QMA** connector for LTE: 2 (female) SMA/QMA** connector for GPS: 1 (female)	
Serial Baud Rate	1000kbps high data rate,250kbps normal for RS232 ; 20Mbps high data rate,250kbps normal for RS422/RS485	
Serial Data Bits	5, 6, 7, 8	
Serial Parity	odd, even, none, mark, space	
Serial Stop Bits	1, 1.5, 2	
RS-232	TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND	
RS-422	Tx+,Tx-, Rx+, Rx-,GND	
RS-485 (2-wire)	Data+, Data-,GND	
Isolation protection	RS422/RS485 2.5KV isolation; 8KV contact & 15KV air RS232 8KV contact and 15KV air ESD	

ORDERING INFORMATION

All QMA connector models are with -Q model name.

- **TMR-5002-1L-2S-WV-54-EUNA.....P/N: 8631-021**
EN50155 Multifunction VPN Router + 1 LTE 4G SMA connectors+ 2 serial RS232 ports + 2 Gigabit X-coded Ethernet (incl. 1PD) for load-Balancing, VPN, Protocol Gateway; EU and US band; dual 16.8V~137.5VDC; -40~65C; IP54 housing
- **TMR-5002-1L-2S-WV-54-APAC.....P/N: 8631-022**
EN50155 Multifunction VPN Router + 1 LTE 4G SMA connectors+ 2 serial RS232 ports + 2 Gigabit X-coded Ethernet (incl. 1PD) for load-Balancing, VPN, Protocol Gateway; APAC band; dual 16.8V~137.5VDC; -40~65C; IP54 housing
- **TMR-5002-1L-2S-WV-54-WW.....P/N: 8631-023**
EN50155 Multifunction VPN Router + 1 LTE 4G SMA connectors+ 2 serial RS232 ports + 2 Gigabit X-coded Ethernet (incl. 1PD) for load-Balancing, VPN, Protocol Gateway; Worldwide band; dual 16.8V~137.5VDC; -40~65C; IP54 housing
- **TMR-5002-1L-2SA-WV-54-EUNA.....P/N: 8631-0211**
EN50155 Multifunction VPN Router + 1 LTE 4G SMA connectors+ 2 serial RS422 ports + 2 Gigabit X-coded Ethernet (incl. 1PD) for load-Balancing, VPN, Protocol Gateway; EU and US band; dual 16.8V~137.5VDC; -40~65C; IP54 housing
- **TMR-5002-1L-2SA-WV-54-APAC.....P/N: 8631-0221**
EN50155 Multifunction VPN Router + 1 LTE 4G SMA connectors+ 2 serial RS422 ports + 2 Gigabit X-coded Ethernet (incl. 1PD) for load-Balancing, VPN, Protocol Gateway; APAC band; dual 16.8V~137.5VDC; -40~65C; IP54 housing
- **TMR-5002-1L-2SA-WV-54-WW.....P/N: 8631-0231**
EN50155 Multifunction VPN Router + 1 LTE 4G SMA connectors+ 2 serial RS422 ports + 2 Gigabit X-coded Ethernet (incl.

- EN50155 Multifunction VPN Router + 2 LTE 4G SMA connectors+ 2 serial RS232 ports + 2 Gigabit X-coded Ethernet (incl. 1PD) for load-Balancing, VPN, Protocol Gateway; APAC band; dual 16.8V~137.5VDC; -40~65C; IP65 housing
- **TMR-5002-2L-2S-WV-65-WW.....P/N: 8631-032**
- EN50155 Multifunction VPN Router + 2 LTE 4G SMA connectors+ 2 serial RS232 ports + 2 Gigabit X-coded Ethernet (incl. 1PD) for load-Balancing, VPN, Protocol Gateway; Worldwide band; dual 16.8V~137.5VDC; -40~65C; IP65 housing
- **TMR-5002-2L-2SA-WV-65-EUNA.....P/N: 8631-0301**
- EN50155 Multifunction VPN Router + 2 LTE 4G SMA connectors+ 2 serial RS422 ports + 2 Gigabit X-coded Ethernet (incl. 1PD) for load-Balancing, VPN, Protocol Gateway; EU and US band; dual 16.8V~137.5VDC; -40~65C; IP65 housing
- **TMR-5002-2L-2SA-WV-65-APAC.....P/N: 8631-0311**
- EN50155 Multifunction VPN Router + 2 LTE 4G SMA connectors+ 2 serial RS422 ports + 2 Gigabit X-coded Ethernet (incl. 1PD) for load-Balancing, VPN, Protocol Gateway; APAC band; dual 16.8V~137.5VDC; -40~65C; IP65 housing
- **TMR-5002-2L-2SA-WV-65-WW.....P/N: 8631-0321**
- EN50155 Multifunction VPN Router + 2 LTE 4G SMA connectors+ 2 serial RS422 ports + 2 Gigabit X-coded Ethernet (incl. 1PD) for load-Balancing, VPN, Protocol Gateway; Worldwide band; dual 16.8V~137.5VDC; -40~65C; IP65 housing
- **TMR-5002-2L-2SB-WV-65-EUNA.....P/N: 8631-0302**
- EN50155 Multifunction VPN Router + 2 LTE 4G SMA connectors+ 2 serial RS485 ports + 2 Gigabit X-coded Ethernet (incl. 1PD) for load-Balancing, VPN, Protocol Gateway; EU and US band; dual 16.8V~137.5VDC; -40~65C; IP65 housing
- **TMR-5002-2L-2SB-WV-65-APAC.....P/N: 8631-0312**
- EN50155 Multifunction VPN Router + 2 LTE 4G SMA connectors+ 2 serial RS485 ports + 2 Gigabit X-coded Ethernet (incl. 1PD) for load-Balancing, VPN, Protocol Gateway; APAC band; dual 16.8V~137.5VDC; -40~65C; IP65 housing
- **TMR-5002-2L-2SB-WV-65-WW.....P/N: 8631-0322**
- EN50155 Multifunction VPN Router + 2 LTE 4G SMA connectors+ 2 serial RS485 ports + 2 Gigabit X-coded Ethernet (incl. 1PD) for load-Balancing, VPN, Protocol Gateway; Worldwide band; dual 16.8V~137.5VDC; -40~65C; IP65 housing

- EMMC Flash Storage**
- **8G.....P/N:8850-113**
- **16G.....P/N:8850-114**
- **32G.....P/N:8850-115**

- Software License**
- **LOAD BALANCING Full Package.....P/N: 9000-102**

OPTIONAL ACCESSORIES

Management System

- **InstaAir.....P/N: 9000-121**
Cloud Based Fleet Management System for Routers

Multifunction Antenna

- **ANT11000091** 5-in-1 omnidirectional antenna – 2G/3G/4G (698-960/1710~2170/2300~2700MHz) MIMO x2 + Wi-Fi 2.4/5GHz MIMO x2 + GPS/GLONASS/GALILEO (1575.42/1602MHz) x1, 3dBi, IP67, cable length: 3M



- **ANT11000092** 6-in-1 omnidirectional antenna – 2G/3G/4G (698-960/1710~2170/2300~2700MHz) MIMO x2 + Wi-Fi 2.4/5GHz MIMO x1 + GPS/GLONASS/GALILEO/BeiDou (1561/1575.42/1602MHz) x1 + AM/FM x1 + DSRC x1, 6dBi, IP67, cable length: 30cm



GPS Antenna

- **ANT12000001** SMA GPS antenna, 28dB, 300m



Cellular Antenna

- **ANT11000044** 2G/3G/4G dipole antenna, 704-960/1710~2690MHz, 1.6dBi, SMA plug, EU



- **ANT11000045** 2G/3G/4G dipole antenna, 698-960/1710~2690MHZ, 3dBi, SMA plug, US



Antenna Base

- **ADA11000053** Magnetic antenna base for 3G/4G, RP SMA Jack Base, Length : 1M



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