Human to Things,
Global Leader in Mobile Broadband Solutions

MODACOM

Human to Things, Global Leader in Mobile Broadband Solutions

Founded in 1991, Modacom has moved to a Global Leader in Mobile Broadband Solutions for High-speed Data Communications and M2M Technologies.

The vision of Modacom is to extend communications from human to machine, and finally to things in order to provide more healthy, wealthy, safe and convenient human life for the people all over the world.
Modacom believes that M2M / IOT technology is a right way to make it's vision a reality.
Modacom provides a total horizontal solution for M2M device and application vendors, which includes SDK (Software Development Kit),RDK (Reference Design Kit), and Communication Modules.
The SDK includes Service Capabilities specified in ETSI M2M, debugging tools, documents, and application examples.
The RDK provides test environments in which M2M device vendors can develop M2M device hardware, M2M device software and Communication Modules.
The M2M communication modules such as WiMAX and LTE can be embedded in the RDK with standard interfaces.
Modacom's M2M solution has been developed based on ETSI M2M standards and will be evolved to support one M2M specifications.

M2M Platform

R&D Areas

Mobile WiMAX Device

LTE Device
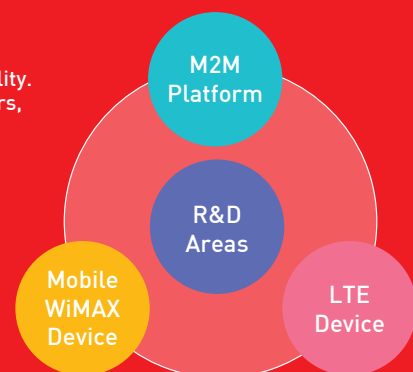
MODACOM
Mobile WiMAX, LTE Product
Portfolio

WiMAX USB Dongle

WiMAX Indoor CPE

WiMAX Module

LTE Module

WiMAX - WiFi Mobile Router

Mobile Router
Strong egg2

KWD-B2800

| 12.4mm | USE TIME 12hrs | STANDBY 20hrs | SLEEP MODE 1200hrs | 2 COLOR | SMART APP | WiFi 802.11n (b/g) |

Silky Hair Line

Stylish Design

2 Color

Sleep Button

KWD-B2800

01. Model | **KWD-B2800**
02. Dimensions & Weight | **87 x 55 x 12.4mm , 36g (82g With battery)**
03. Battery-Powered Time | **12hours**
04. Battery Standby Time | **20hours**
05. Battery Sleep-mode Time | **1200hours**
06. Connection | **Up to 7 devices simultaneous connection**
07. Wi-Fi | **802.11 b/g/n support**
08. Battery | **2260mAh / Rechargeable & Removable**
09. Indicator LED | **WiMAX, Wi-Fi, Power**
10. Application | **The 1st smart application remote controlled mobile router in Korea**
11. Service Provider (Country) | **KT (Korea)**
12. Launch Date | **2012. 11**

Smart Application

• Overview / What is the URoad Magic?
• As the 1st smart application remote controlled mobile router in Korea,
  the URoad Magic can be used more simply and smartly without taking it out of bag.
• The URoad Magic allows users to check the status (WiMAX signal and battery level) of KWD-B2800,
  set power mode (power off / reboot) and set power save mode (entering sleep mode/
  setting sleep mode reservation) on smart phone and tablet PCs.
• Supported Models: URoad-SS10(in Japan), KWD-B2800 (in Korea), URoad-Aero(in Japan)
• Currently (Dec.2012), a function of sleep mode reservation is only supported for KWD-B2800 in Korea.

iOS Application   **ANDROID** Application

H/W Specification

WiMAX	
Standard	IEEE802.16e-2005
Frequency Band	2.3GHz
Access / Duplex	OFDMA / TDD
RF Paths	1Tx, 2Rx
Modulation (UL)	QPSK / 16QAM / 64QAM
Demodulation (DL)	QPSK / 16QAM / 64QAM
Rx Sensitivity	-95dBm@Data
Max. Tx Power	26dBm@ Antenna Port
Antenna	Internal Antenna (Main/Diversity)
Maximum Throughput @ UDP	Downlink : 40 Mbps (H-ARQ CAT-7)
	Uplink : 15.4Mbps (H-ARQ CAT-7)
Wi-Fi	
Standard	IEEE802.11b/g/n
Frequency	2.400 ~ 2.483GHz
Channels Channels	1~13ch
Channel Bandwidth	802.11b/g : 20MHz
	802.11n : 20MHz
RF Paths	1Tx, 1Rx
Modulation	802.11b / DSSS (CCK, DQPSK, DBPSK)
	802.11g / OFDM (64QAM, 16QAM, QPSK, BPSK)
	802.11n / OFDM (64QAM, 16QAM, QPSK, BPSK)
Rx Sensitivity	802.11b : -84dBm, 802.11g : -68dBm, 802.11n : -65dBm
Tx Power	802.11b : 8dBm, 802.11g/n : 8dBm
Authentication	Open, WPA-PSK, WPA2-PSK
Encryption	WEP(64bit,128bit) TKIP, AES

S/W Specification

Firmware Update	Local Update , Remote (HTTP-based OTA)
WiFi	SSID Configuration, WiFi Security (WEP,WPA,WPA2)
	LAN Configuration, DHCP Configuration
Firewall	MAC / IP / Port Filtering, Port Forwarding, DMZ, URL Filtering
Protocols	TCP / UDP over IPv4
NAT	NAT (NAPT), VPN pass-through
Management	Serial Interface, Telnet Server, Factory Default, System Reset

Speed & Stylish
Indoor CPE

KWD-C2000

STYLISH DESIGN	LAN 2Port	DEVICE CONNECT 12	DESKTOP WALL-MOUNT	1 COLOR	HIGH POWER MODE	WiFi 802.11n (b/g)	WiFi CERTIFIED

Window LED

Top Cover design

Desktop cradle

Wall mount cradle

KWD-C2000

01. Model | KWD-C2000
02. Dimensions | 140 x 98.3 x 36.5mm (Without Cradle) , 152 x 126 x 70mm (With cradle)
03. Weight | 220g (with cradle)
04. Antenna | Internal Antenna
05. Interface | 2 port RJ45 Jack (Ethernet to Ethernet Throughput : 100Mbps)
06. Indicator LED | Power, WiMAX, WiFi, LAN x 2
07. Power Supply | External Micro USB 5Pin AC Adapter (DC/DC Converter)
08. Tx Power | 25dBm
19. Service Provider (Country) | KT (Korea)
10. Launch Date | 2012. 02

BIS (Bus Information System)
install on a bus or at bus stops to display real time departure-arrival information

Rent-a-Car
CPE devices are available to customers who rent a car

Indoor CPE Application

Pubilc Mobile Internet Service
install within the subway station or subway carts to allow multi users access wireless internet service

Telemetering
[Water / Electricity / Gas]
WiMAX CPE can be applied telemetering by easy installation

H/W Specification

WiMAX	
Standard	IEEE802.16e-2005
Frequency Band	2.3/ 2.4/ 3.5 GHz
Access / Duplex	OFDMA / TDD
RF Paths	1Tx, 2Rx
Modulation (UL)	QPSK / 16QAM / 64QAM
Demodulation (DL)	QPSK / 16QAM / 64QAM
Rx Sensitivity	-95dBm@Data
Max. Tx Power	25dBm@ Antenna Port
Antenna	Internal Antenna (Main/Diversity)
Maximum Throughput @ UDP	Downlink : 40 Mbps (H-ARQ CAT-7)
	Uplink : 15.4Mbps (H-ARQ CAT-7)
Wi-Fi	
Standard	IEEE802.11b/g/n
Frequency	2.412 ~ 2.483GHz
Channels	Channels : 1~13ch
Channel Bandwidth	802.11b/g : 20MHz
	802.11n : 20 / 40MHz
RF Paths	1Tx, 1Rx
Modulation	802.11b / DSSS (CCK, DQPSK, DBPSK)
	802.11g / OFDM (64QAM, 16QAM, QPSK, BPSK)
	802.11n / OFDM (64QAM, 16QAM, QPSK, BPSK)
Rx Sensitivity	802.11b : -84dBm, 802.11g : -68dBm, 802.11n : -65dBm
Tx Power	802.11b : 18dBm, 802.11g/n : 15dBm
Authentication	Open, WPA-PSK, WPA2-PSK
Encryption	WEP(64bit,128bit) TKIP, AES

S/W Specification

Firmware Update	Local Update , Remote (HTTP-based OTA)
WiFi	SSID Configuration, WiFi Security (WEP,WPA,WPA2)
	LAN Configuration, DHCP Configuration
Firewall	MAC / IP / Port Filtering, Port Forwarding, DMZ, URL Filtering
Protocols	TCP / UDP over IPv4
NAT	NAT (NAPT), VPN pass-through
Management	Serial Interface, Telnet Server, Factory Default, System Reset

Super Slim & Strong
Mobile Router

URoad-Aero, URoad-Aero Station

8.4mm	USE TIME 12hrs	STANDBY 20hrs	SLEEP MODE 1000hrs	3 COLOR	SMART APP	WiFi 802.11n (b/g)

8.4mm Silm design

Sleep Button

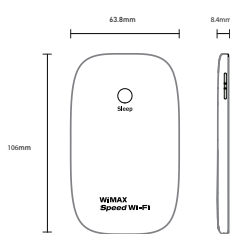Pure Crystal Cradle

Laser Cutting LED

URoad-Aero, URoad-Aero Sation

130mm

114mm   53.6mm
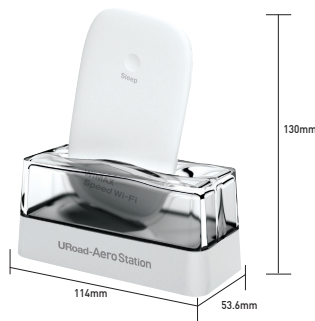
01. **Super Slim & Strong**
   [Extreme Thickness: 8.4mm / 12 Hour Continuous Operating Time]
02. **Admirable Cradle Design**
   [WAN/LAN Support]
03. **Convenient Smart App. Support**
   [Signal Strength, Battery Life, Connected Devices, Power Saving & Sleep Timer Setting]

URoad-Aero

63.8mm   8.4mm

106mm

Countries	JAPAN
Standard	WiMAX : IEEE802.16e-2005
	WiFi : IEEE802.11 b/g/n
General Specification	Max. 12 Hours
	Continuous Operating time
	Max. 1000 Hours Sleep time
	106 x 63.8 x 8.4mm, 74g
Unique Point	Max. 8.4, Min. 7.6mm

URoad-Aero Station

55.7mm

114mm
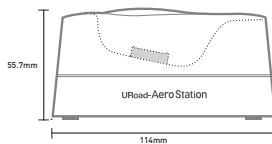
Countries	JAPAN
General Specification	1 Port RJ45 (WAN/LAN)
	Micro USB Charging
	AP/Router Switching
	114 x 53.6 x 55.7mm
Unique Point	Pure Crystal Cradle

Smart Application

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• As the 1st smart application remote controlled mobile router in Korea,
  the URoad Magic can be used more simply and smartly without taking it out of bag.
• The URoad Magic allows users to check the status (WiMAX signal and battery level) of URoad-Aero,
  set power mode (power Off / reboot) and set power save mode (entering sleep mode/
  setting sleep mode reservation) on smart phone and tablet PCs.
• Supported Models: URoad-SS10, KWD-B2800, URoad-Aero

iOS Application   ANDROID Application

H/W Specification

| WiMAX	
Standard	IEEE802.16e-2005
Frequency Band	2.5GHz
Access / Duplex	OFDMA / TDD
RF Paths	1Tx, 2Rx
Modulation (UL)	QPSK / 16QAM / 64QAM
Demodulation (DL)	QPSK / 16QAM / 64QAM
Rx Sensitivity	-95dBm@Data
Max. Tx Power	25dBm@ Antenna Port
Antenna	Internal Antenna (Main/Diversity)
Maximum Throughput @ UDP	Downlink : 40 Mbps (H-ARQ CAT-7)
	Uplink : 15.4Mbps (H-ARQ CAT-7)
Wi-Fi	
Standard	IEEE802.11b/g/n
Frequency	2.400 ~ 2.483GHz
Channels Channels	1~13ch
Channel Bandwidth	802.11b/g : 20MHz
	802.11n : 20MHz
RF Paths	1Tx, 1Rx
Modulation	802.11b / DSSS (CCK, DQPSK, DBPSK)
	802.11g / OFDM (64QAM, 16QAM, QPSK, BPSK)
	802.11n / OFDM (64QAM, 16QAM, QPSK, BPSK)
Rx Sensitivity	802.11b : -84dBm, 802.11g : -68dBm, 802.11n : -65dBm
Tx Power	802.11b : 8dBm, 802.11g/n : 8dBm
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Firewall	MAC / IP / Port Filtering, Port Forwarding, DMZ, URL Filtering
Protocols	TCP / UDP over IPv4
NAT	NAT (NAPT), VPN pass-through
Management	Serial Interface, Telnet Server, Factory Default, System Reset

Super High
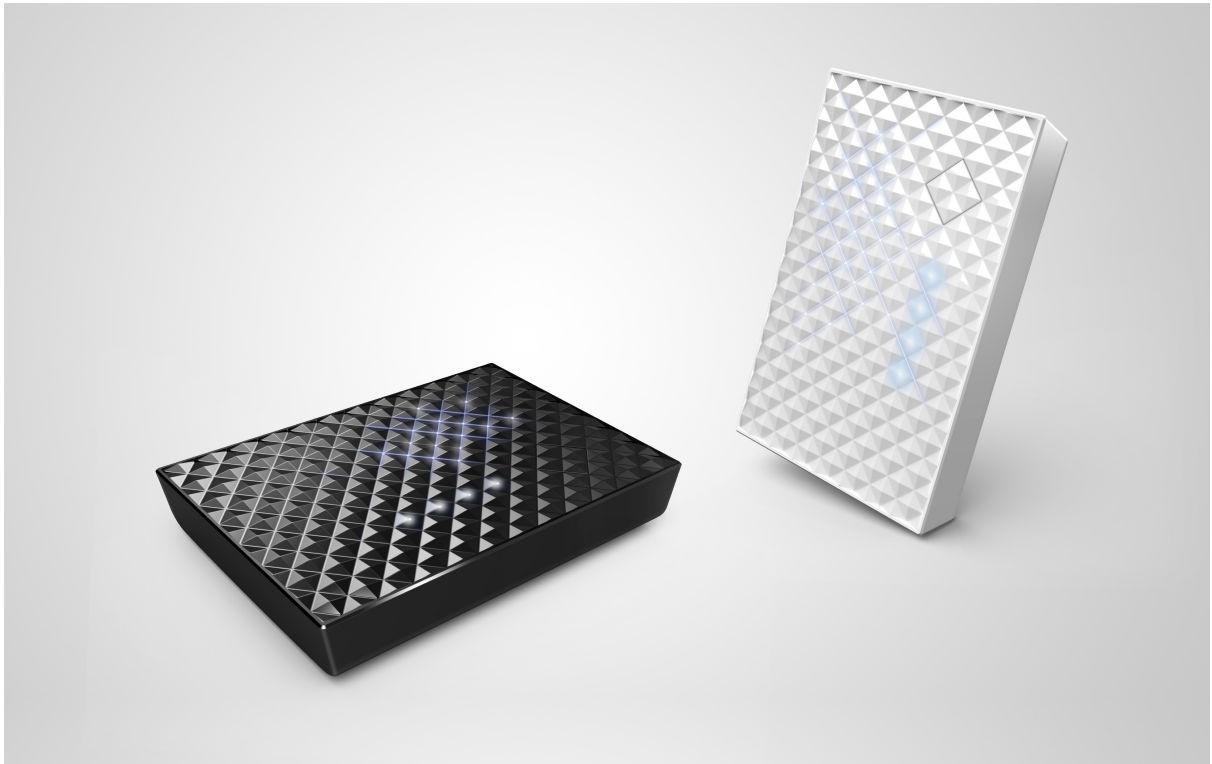# Speed & Strong
Mobile Router

URoad-LTE
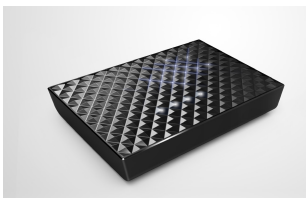
Strong deisgn
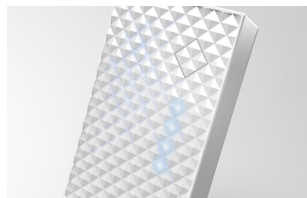
LED Lamp
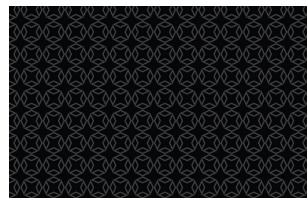
Luxury Pattern

Hibernation key

URoad-LTE

LTE Standard	3GPP E-UTRA Release 9
Throughput	150Mbps(DL) / 50Mbps(UL) @ CAT4
WiFi	IEEE 802.11 a/b/g/n
Continuous Operating Time	more than 6 hours

H/W Specification

LTE	
Standard	3GPP E-UTRA FDD/TDD-LTE Release 9, UE Category 4
Multiplexing	FDD/TDD
Supporting BAND	FDD : 1,3,5,7,8,11,12,13,14,18,20,25,26
	TDD : 38,39,40,41
RF Paths	1Tx, 2Rx
Throughput	DL/UL 150Mbps/50Mbps@20MHz
Activation	USIM
Max. Tx Power	23dBm@ Antenna Port
Wi-Fi	
Standard	IEEE802.11 a/b/g/n
Frequency	b/g/n : 2.400 ~ 2.483GHz
	a/n : U-NII-1, U-NII-2, U-NII-2e, U-NII-3
RF Paths	2Tx, 2Rx
Authentication	Open, WPA-PSK, WPA2-PSK
Encryption	WEP(64bit,128bit) TKIP, AES

S/W Specification

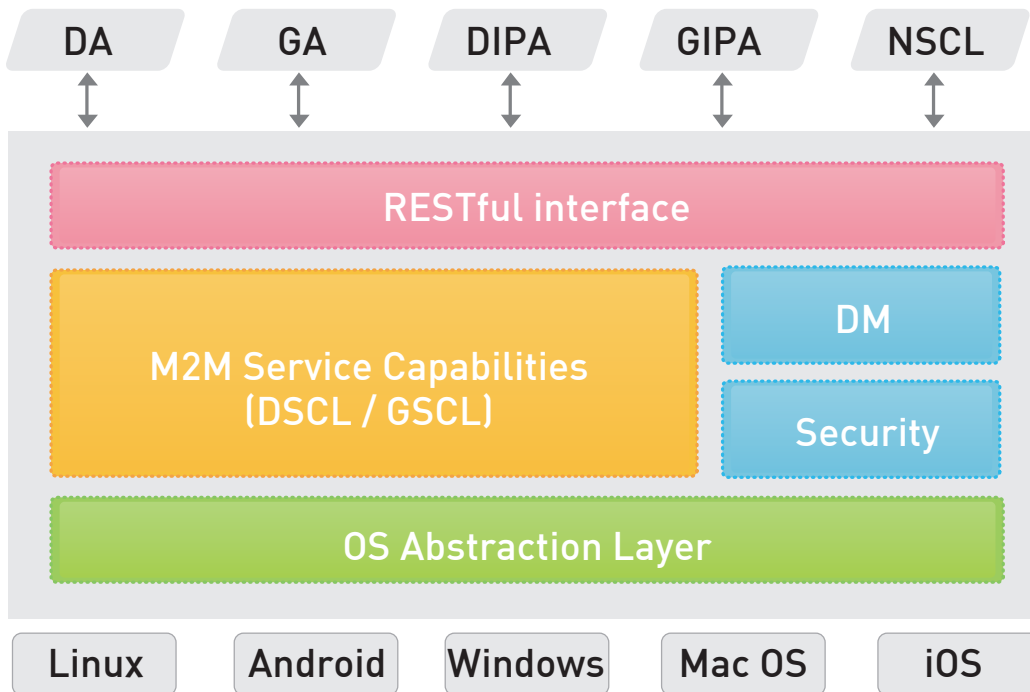|	
Firmware Update	Local Update , Remote (HTTP-based OTA)
WiFi	SSID Configuration, WiFi Security (WEP,WPA,WPA2) LAN Configuration, DHCP Configuration
Firewall	MAC / IP / Port Filtering, Port Forwarding, DMZ, URL Filtering
Protocols	TCP / UDP over IPv4
NAT	NAT (NAPT), VPN pass-through
Management	Serial Interface, Telnet Server, Factory Default, System Reset

Software Development Kit for the
M2M Devices

SDK

Based on ETSI M2M standards and supports multi-OS device platform.

M2M Device SDK has been developed based on ETSI M2M standards, and the M2M service capabilities were modularized.
It is communication technology-agnostic and operational on several types of operating systems including Android,
Linux, Windows, Mac OS and iOS. The following figure shows an overview of functional architecture of the M2M Device SDK.
The SDK also includes debugging tools, documents and examples of applications. It can be executed in the form of mobile phone's application.

DA	GA	DIPA	GIPA	NSCL

RESTful interface

M2M Service Capabilities (DSCL / GSCL)

DM

Security

OS Abstraction Layer

Linux	Android	Windows	Mac OS	iOS

• Supports Multi OS :
  Linux, Windows, Android, Mac OS, iOS
• Comply with ETSI M2M standards
  (TS 102 690 R2, TS 102 921 R2)
• DM : OMA-DM, TR-069
• Security : EAP-TLS, EAP-GPSK, PANA
• RESTful I/F : HTTP/XML, MTOM, XOP (CoAP later)

Example of M2M Devices using the SDK

Applications of Standard M2M Device Platform are expanded.

The Standard M2M Device Platform is already installed on various commercial and trial Products cooperating with KT.
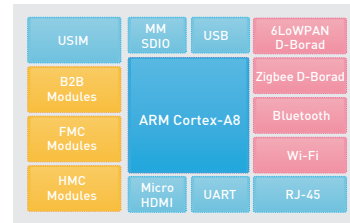
Main Security controller	M2M IP Camera	M2M Shoes sensor	Android Devices	M2M Gateway

Reference Design Kit for the
M2M Devices

RDK

Provides an integrated development environment for M2M Devices with SDK and 4G M2M communication modules.

M2M Device RDK supports test environments in which M2M device vendor can develop M2M device hardwares, communication modules, service middleware and applications, It also provides wireless communication interfaces such as 6LoWPAN, ZigBee, Bluetooth and Wi-Fi in order to connect to M2M area networks where various sensor nodes or terminal devices exist. The communication modules such as WiMAX and LTE can be embedded on the RDK with standard host interface.

M2M HW Reference Design Kit
Modacom. Co., Ltd.

			6LoWPAN D-Borad
USIM	MM SDIO	USB	
B2B Modules			Zigbee D-Borad
FMC Modules	ARM Cortex-A8		Bluetooth
			Wi-Fi
HMC Modules	Micro HDMI	UART	RJ-45

ARM Coretex-A8 | WAN TD/FD-LTE WiMAX | PAN 6LoWPAN ZigBee Bluetooth | ANDROID ICS 4.0 | Embeded Linux | Multi I/O

- B2B & Full/Half PCI-e Mini Card interfaces
- 6LoWPAN, ZigBee, Bluetooth, Wi-Fi support for M2M Area Network
- Video output via Micro HDMI
- H/W Interfaces: USB, UART, USIM, etc.
- ARM Cortex-A8, RAMx1G, ROMx1G
- Linux 2.6.3x, Android ICS support
- Size : 170 x 120 x 34mm

M2M Communication
Modules

Module

Support standard interfaces applicable to 4G wireless communication technologies.

Modacom's M2M communication modules support 4G mobile communication technologies including WiMAX and LTE.
WiMAX modules support WiMAX-16e specifications and LTE modules support TD-LTE, FDD-LTE technologies.
They can be easily connected to M2M terminal devices because they have standardized form factors and host interfaces.
B2B(Board-to-Board) type module is standardized in TTA in Korea and PCI express mini card type is based on PCI SIG standards.
The standardization scope includes mechanical and electrical specifications of the modules.

FDD-LTE, TD-LTE (B2B, FMC, HMC, SiB)

WiMAX 16e (B2B, FMC, HMC, SiB)

4G Communication Modules

- FDD-LTE Module (3GPP)
- TD-LTE Module (3GPP)
- WiMAX Module (IEEE802.16e)

Standard interfaces and sizes

- B2B - 28 x 38 x 4mm
- HMC - 26.8 x 30 x 4.75mm
- FMC - 50.95 x 30 x 3.4mm
- SiB - 23 x 30 x 2.4mm