

Cost cutting by hardware concept, save of airtime and selecting of GSM provider

**Round Solutions GmbH & Co KG
Worldwide Leading Wireless Solution Supplier**

**Harald Naumann, Technical Director
May 2007**

Moving back to 1996 Cellular modules and its limitations

- **SMS in PDU mode only**
- **No CSD calls in transparent / non-transparent in same time
Selection by AT command**
- **Voice calls not supported**
- **No internal SIM card reader**
- **Euro 600 per pcs.**

Mobile phone manufacturer 1996

- **AT command SMS mobile phone Euro 12.500**
- **AT command set for CSD Euro 12.500 extra**
- **Each application has do be tested by the supplier
and paid extra as well**

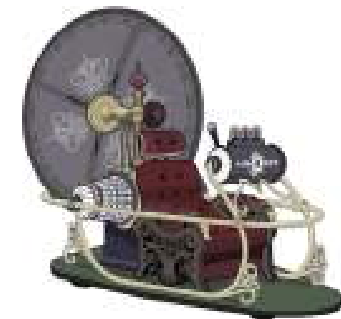


Moving forward to 2007

Cellular modules and its benefits

Today we offer to our customers

- **Smallest Quad band module with internal SIM card reader**
- **Smallest Quad band module without SIM card reader**
- **Smallest combined GPRS / GPS module**
- ✓ **Smallest embedded antennas with lowest MOQ**
- ✓ **Biggest range of Quad and Penta antennas**
- ✓ **Biggest user forum for GSM modules with 24/7 support**
- ✓ **Free of charge AT command sets and application notes**
- ✓ **In-house tests with our GSM tester**
- ✓ **Worldwide delivery service**



Latest news and future news Cellular modules and its benefits

Latest news

- Tracking server for developers www.track4free.com
- Pin compatible UMTS and CDMA modules
- Smallest embedded GSM antennas

Future news

- Homepage www.roundsolutions.com at "News"
- User Forum www.roundsolutions.com at "Showroom & News"
- Round Solutions News Letter



GPRS Module

Connector version

- Costs for connector
- Costs for pick and place
- Higher costs for module assembling

BGA version

- No board to board connector needed
- Lower assembling costs
- Smaller PCB ⇒ lower costs for PCB, smaller and cheaper enclosures



30 x 30 x 2,8 mm only



GPRS Module price 50 to 70 Euro

GPS Module

Connector version

- Costs for connector
- Costs for pick and place
- Higher costs for module assembling



Embedded version

- No board to board connector needed
- Lower assembling costs
- Smaller PCB ⇒ lower costs for PCB, smaller and cheaper enclosures



GPS Module Price 25 to 35 Euro

Switched Power Supply

Example of a Customer Design

- **BOM 25 Euro**
- **High performance and high quality design**
- **Small quantity, because end user is German police**

Round Solutions

- **BOM 5 Euro**
- **Planned for mass production**
- **Same performance and same quality but much lower BOM**

Price 5 to 25 Euro

Battery

Lithium polymer

- Medium costs
- Small size
- Handling more difficult
- Nearly no standard batteries in supermarkets available
- Charger is already inside the GPRS module

NiMH

- Low costs
- Medium size
- Handling very easy
- Standard batteries available
- External charger is necessary

Price 6 to 15 Euro

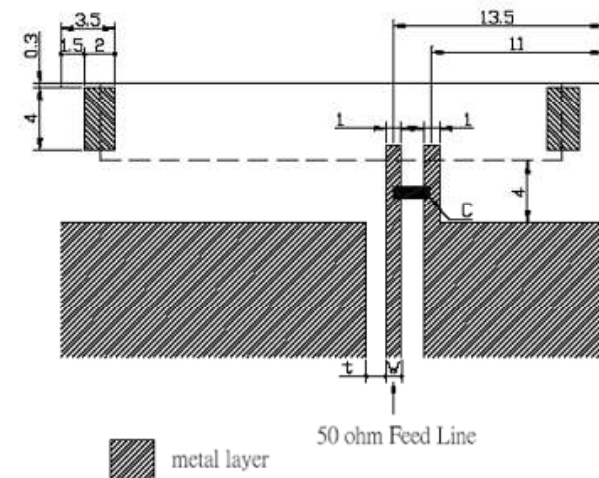
RF Cables

Connector version

- Two RF cables
- Two or four RF connectors
- Assembling costs for the cables
- Possible mechanical problems

BGA version

- 50 Ohm micro strip line
- Zero or two RF connectors
- No mechanical problems
- Smaller PCB \Rightarrow lower costs for PCB, smaller enclosure



Price 0 to 8 Euro

Enclosures

Metal

- Higher weight ⇨
Higher transport costs
- Only with external antennas
- Medium to high price

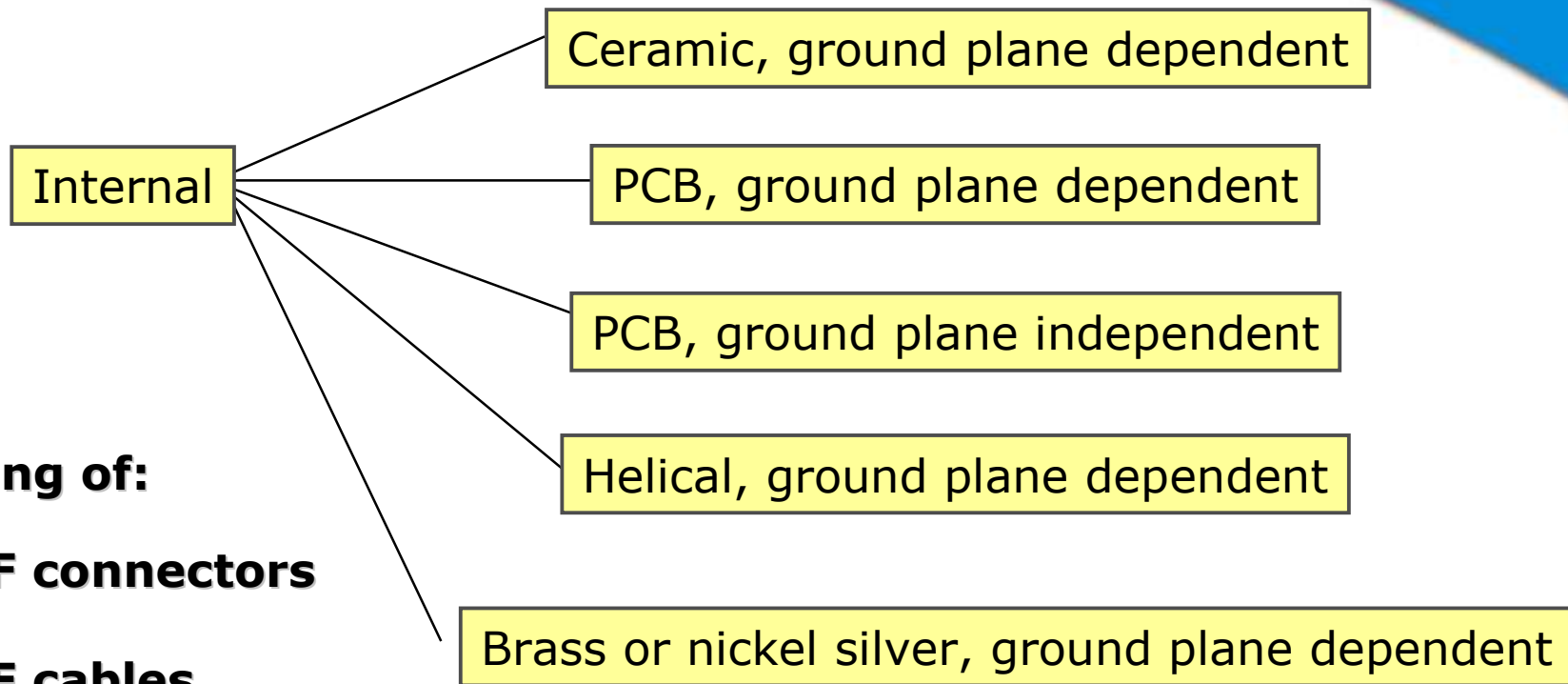
Plastic

- Medium weight ⇨
Lower Transport costs
- Internal and external antennas
- Low to medium price
- Ready to use enclosures for mobile applications



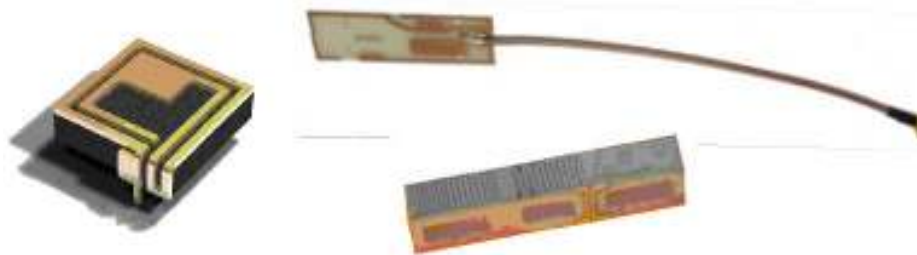
Price 20 to 25 Euro

Internal Antennas



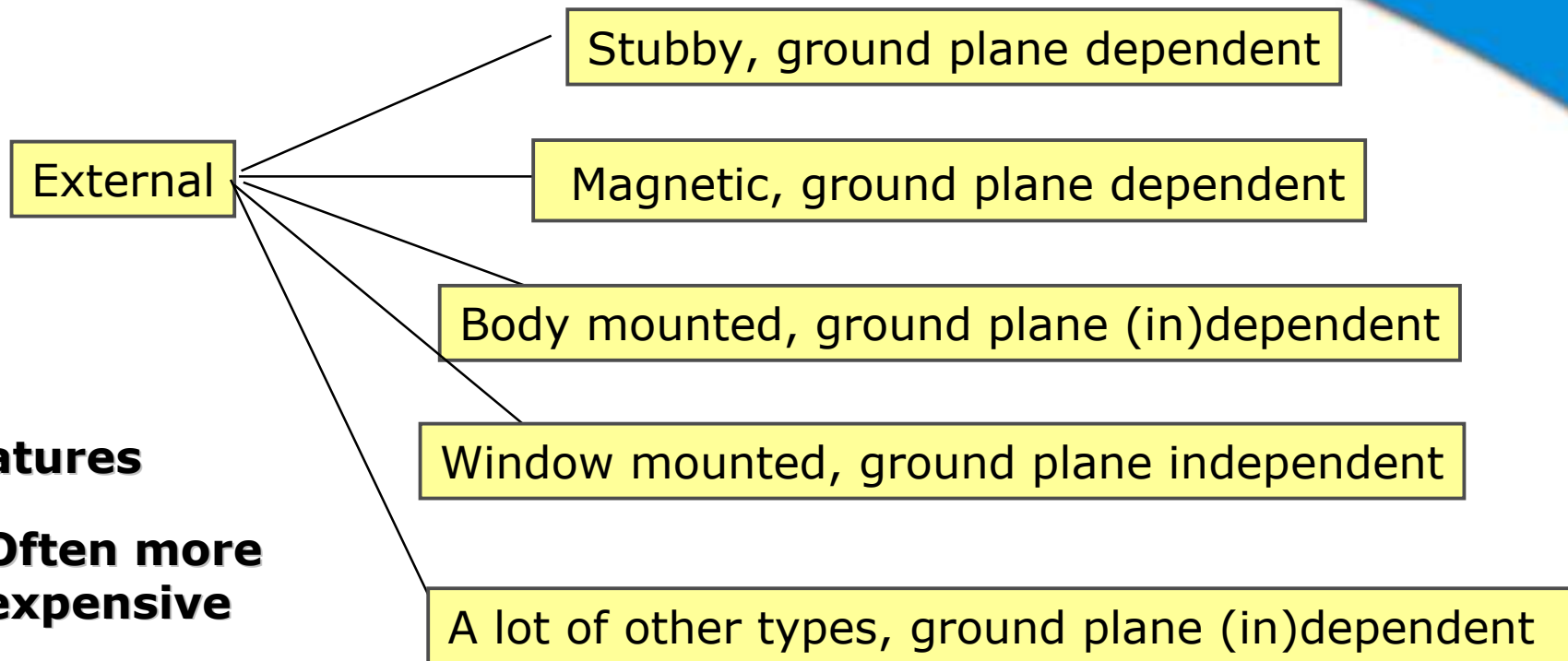
Saving of:

- RF connectors
- RF cables (sometimes)
- Costs for assembling



Price 5 to 8 Euro

External Antennas



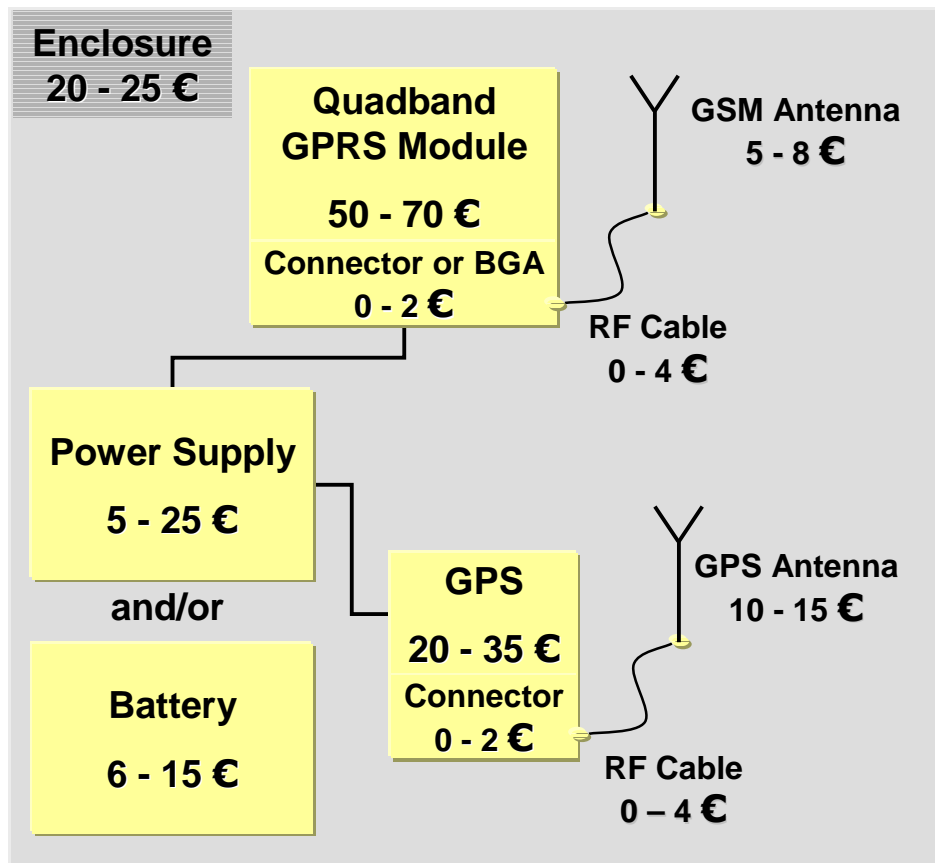
Features

- Often more expensive
- Necessary in some applications



Price 5 to 35 Euro

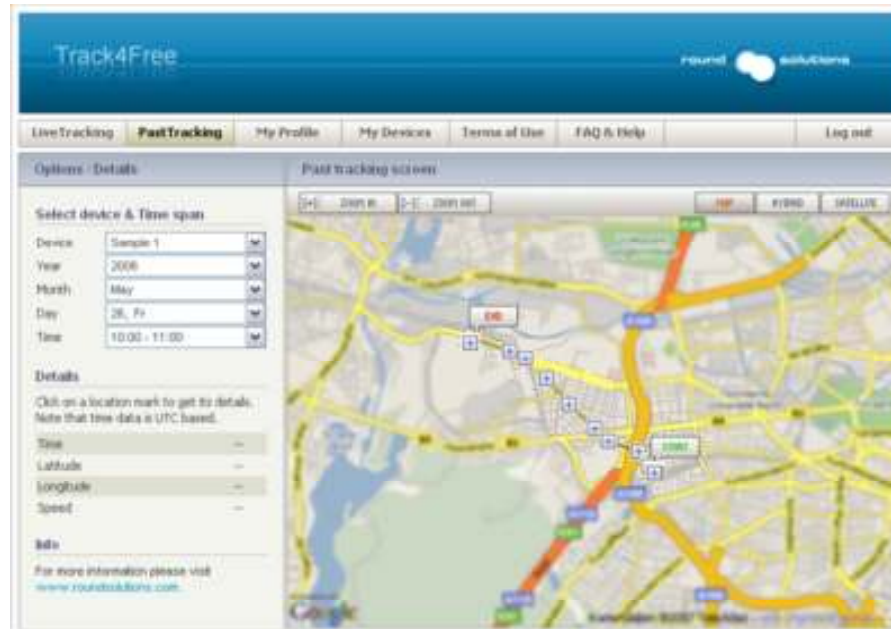
Estimated BOM 1000 pcs.



Component	Typical Case	Round Solutions Optimized
GPRS Module	70 €	50 €
Power Supply	25 €	5 €
Battery	15 €	6 €
RF Cables	10 €	0 €
GPS Module	35 €	25 €
GSM Connector	2 €	0 €
GPS Connector	2 €	0 €
GSM Antenna	8 €	5 €
GPS Antenna	15 €	10 €
Enclosure	25 €	20 €
	205 €	121 €

Enhanced services Tracking server www.track4free.com

User interface track4free

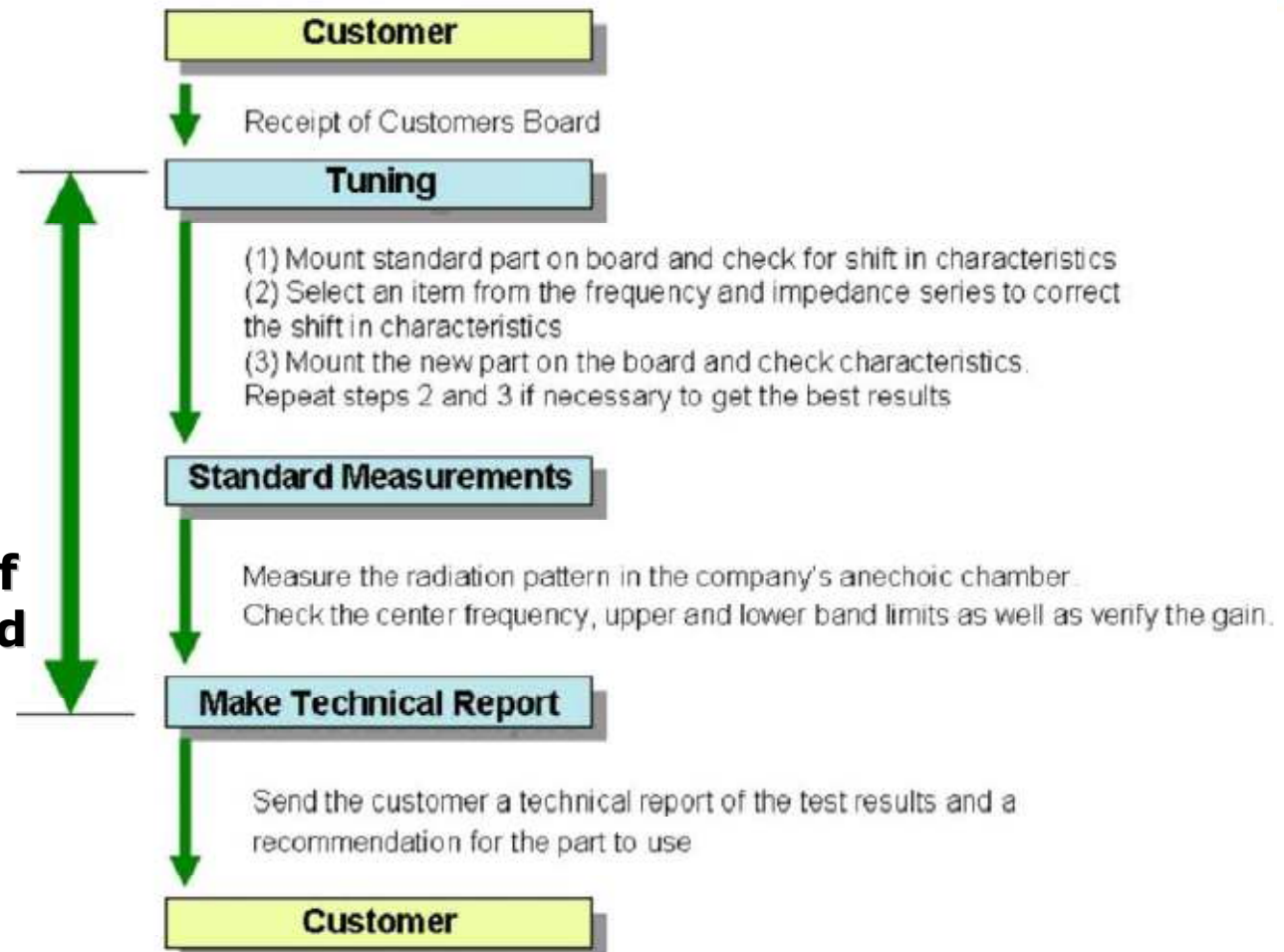


GPRS / GPS starter kit



Enhanced services Design in aid for embedded antennas

- **Tuning and customisation of antennas**
- **Development of matching circuit**
- **Development of new customised antennas**



Enhanced services Fixed IP addresses for GPRS / UMTS

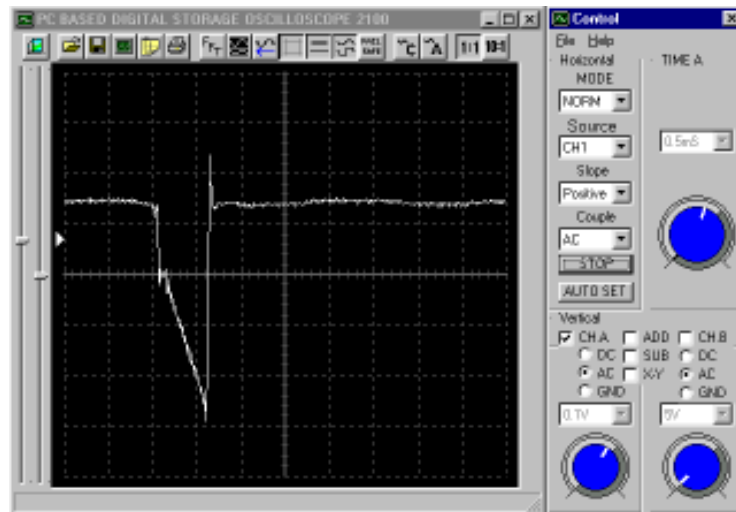
- Access to device by Web Browser
- Web server runs direct on the GPRS module
- IP communication from device to device
- IP communication from device to Internet server
- IP communication from device to mobile handset
- From T-Mobile to Vodafone and backward
- Test IP addresses 90 days free of charge

Launched
in Milano 2007

Enhanced services Design Check by GSM tester

Origin customer design

- Power supply during 2 Watt power and capacitor 100 μ F
- 400 mV ripple



Our design

- Power supply during 2 Watt power and capacitor 220 μ F
- 150 mV ripple

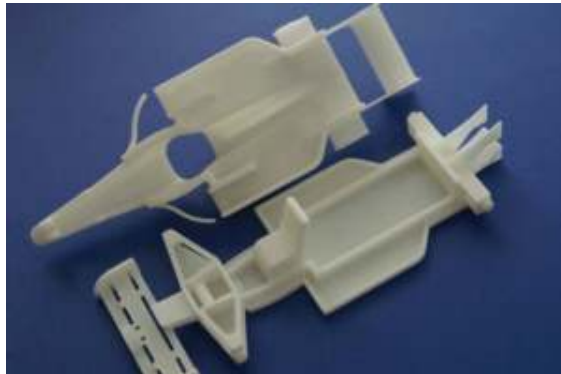


Launched
in Milano 2007

Enhanced services

Rapid prototyping of enclosures

Example for top and bottom of enclosure

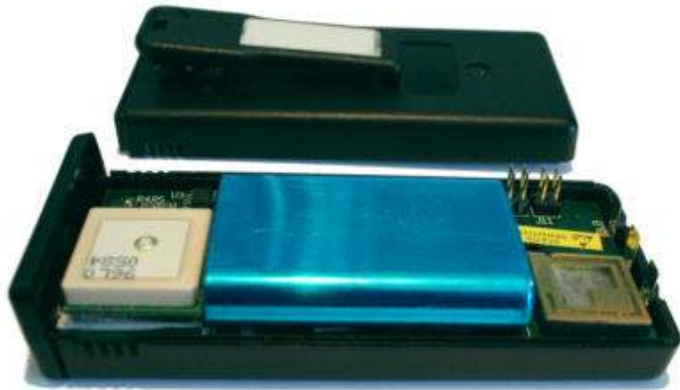


- Robust material Polyamide
- Very detailed by using files in format STL
- Minimum edge length of polygons 0,01 mm
- Only Euro 350 to 400 for handheld enclosure
- Delivery after 2 - 3 working days

Launched
in Milano 2007

How could it look like?

All together



Tracking device in use



Round Solutions design concept

- All A- and B-Components
- Ready for redesign
- Ready for customization
- Ready for rabbit prototyping
- Sources for digital maps
- Sources for map engines
- Information update service

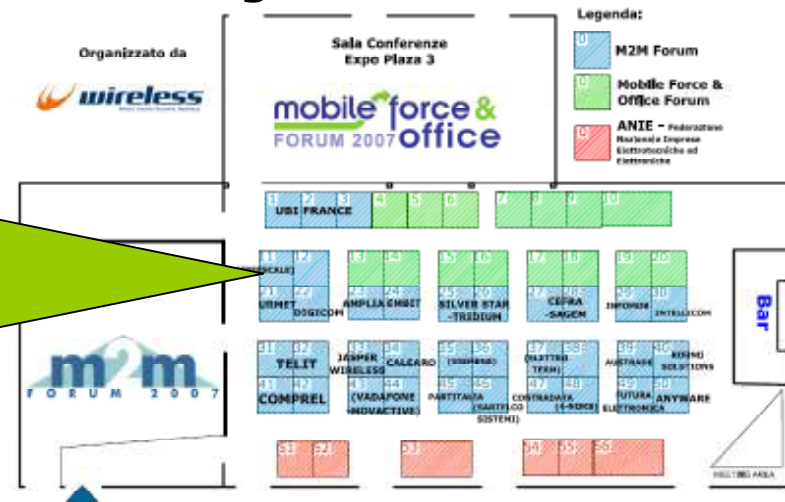
33% off during the event on one GSM and/or GPS starter kit *



* with tons of accessories like antennas, RF cables, board to board connectors, microphone, speaker, battery, SIM card holders
and access to the world-wide biggest user forum for GSM / GPS with 3400+ members all over the globe.



You find us at stand 11



* Limited offer. One starter kit per company only

***We are looking forward to seeing you
at our stand number 11***

**Round Solutions GmbH & Co KG
Im Steingrund 3
63303 Dreieich
Germany**

Parliamo italiano +49 (0) +49 6103 27044220

Kundtjänst på Svenska +49 (0) +49 6103 27044210

Hablamos el español +49 (0) +49 6103 27044230

English +49 (0) +49 6103 27044220

German +49 (0) +49 6103 270440

Fax +49 (0) +49 6103 27044199

info@roundsolutions.com

www.roundsolutions.com