GlobalTop Technology
AGPS Platform Solution

Note

Thank you for choosing GlobalTop Technology as your GPS module and solution provider. As the need for GPS related products rises, the demands for a faster, more reliable, and longer lasting (power saving) solution will increase correspondently.

GlobalTop's answer to this challenging equation is GlobalTop AGPS solution, which this document will explicitly describe. If you have questions or concerns, please feel free to contact us sales@gtop-tech.com .

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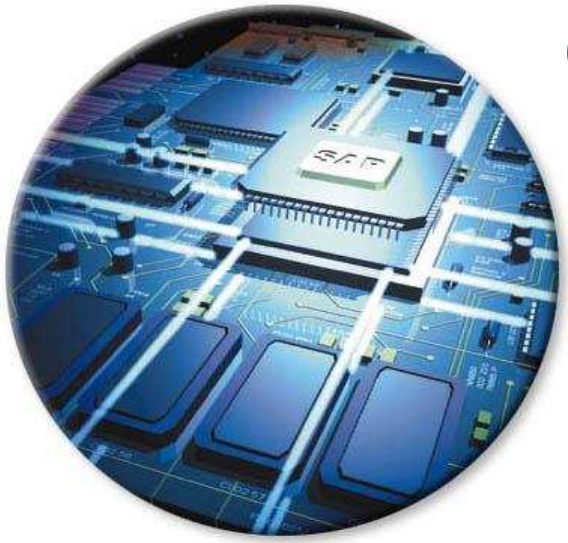

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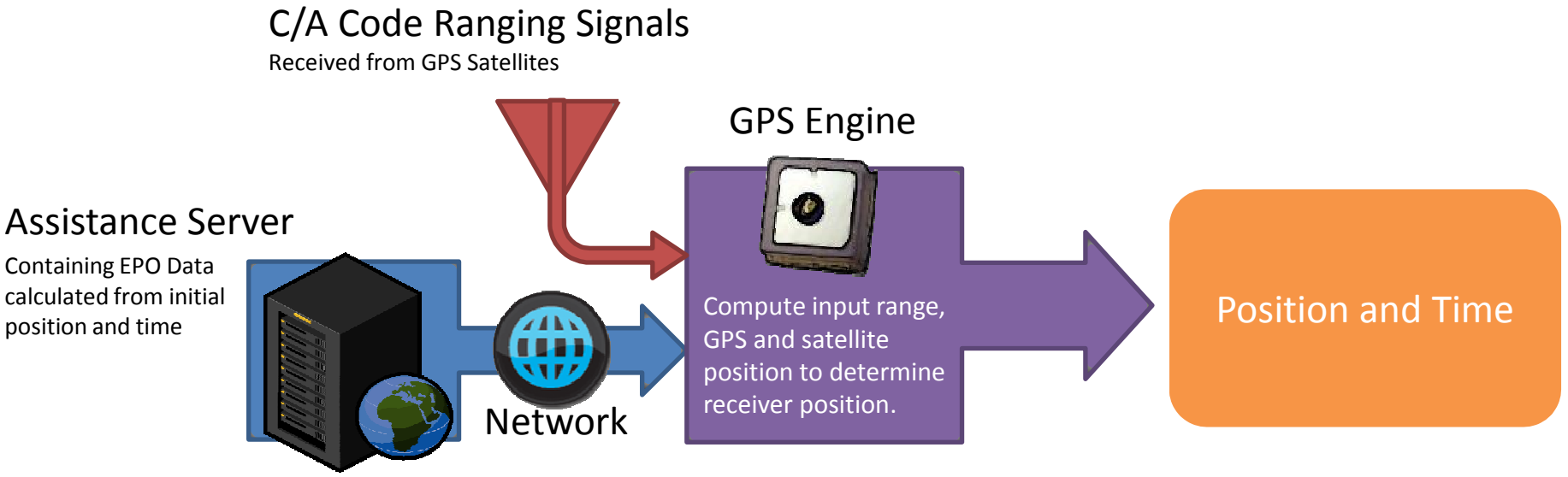
Introduction to AGPS

- What is AGPS?
  - AGPS, stands for Assisted GPS, is a method which accelerates the time required for GPS module to “fix” onto Global Positioning Satellites, thus aiding the GPS receiver to perform a faster positioning calculation when under a weak signal environment.

- Why AGPS?
  - When GPS device is first turned on, almanac and ephemeris must be transmitted continuously for 40 seconds from satellite to the GPS receiver for proper operation.
  - If a clear signal cannot be received continuously (like in urban environment), this update will take a significant amount of time, and under the worst case scenario, the device will be rendered useless. Not only will valuable time be wasted, but the update itself will also take heavy tolls on the remaining battery power.

Urban environments with lots of high rise infrastructure will greatly interfere with GPS signal reception.

How AGPS system works



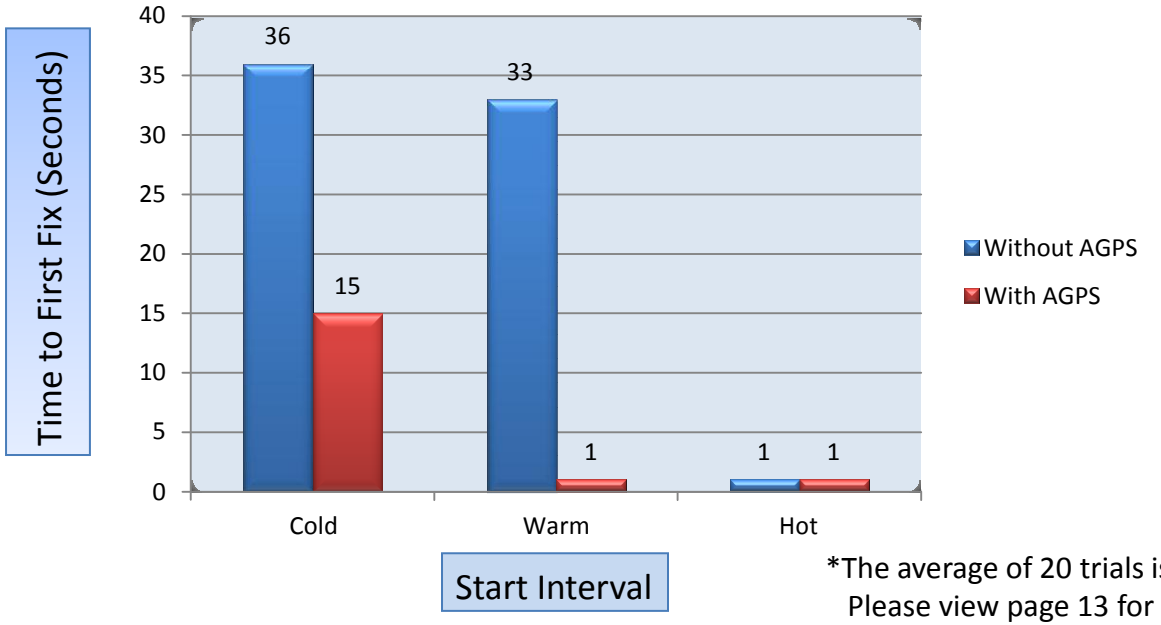
- Extended Prediction Orbit data, or EPO data, containing the predetermined orbital positioning information of GPS satellites, are pre- uploaded to the GPS engine from the assistance server through some form of network communication.

- Positional and time information can be accurately computed when the EPO data is used in conjunction with the real-time C/A code acquired wirelessly from the GPS satellites.

AGPS Performance

AGPS TTFF Comparison

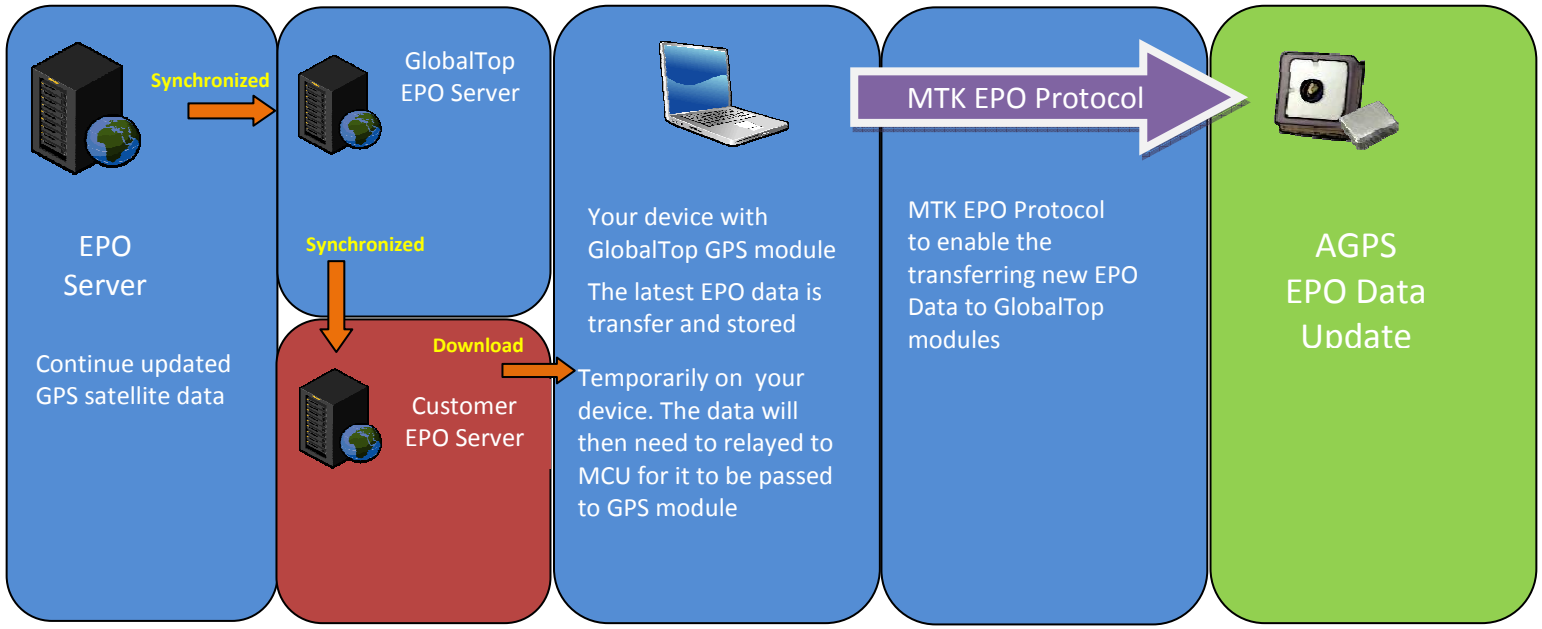
(The smaller the better)



*The average of 20 trials is taken as the data;
Please view page 13 for detail analysis.

- On average, AGPS significantly improves TTFF time:
  - AGPS Cold Start Time is about one-third to one-half of the one without AGPS support
  - AGPS Warm Start Time averages around 1 seconds, offers the most drastic improvement and is almost as fast as Hot Start Time of the original
  - AGPS Hot Start Time is almost the same as the original.

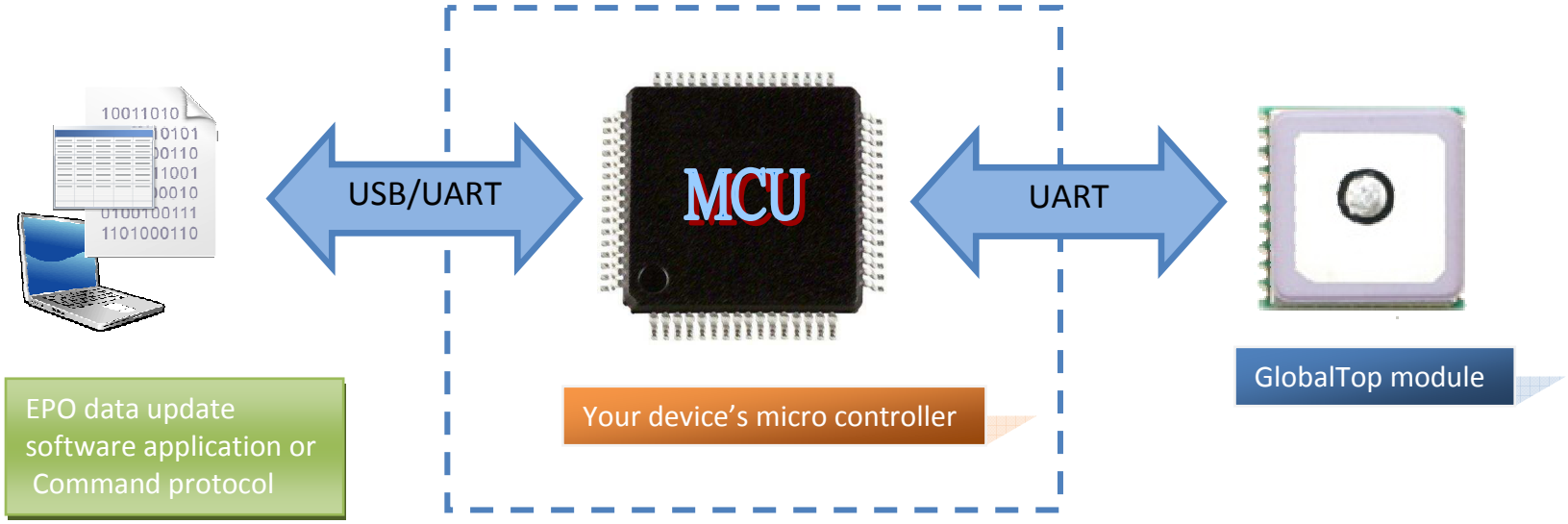
GlobalTop AGPS Solution Platform



- GlobalTop provides account and password to let user to synchronized EPO data with your own customized EPO Server.

- Your end customer will be downloading this EPO data from your customized EPO server to your device, which will be relayed internally through the processor to our GPS module using MTK AGPS protocol.

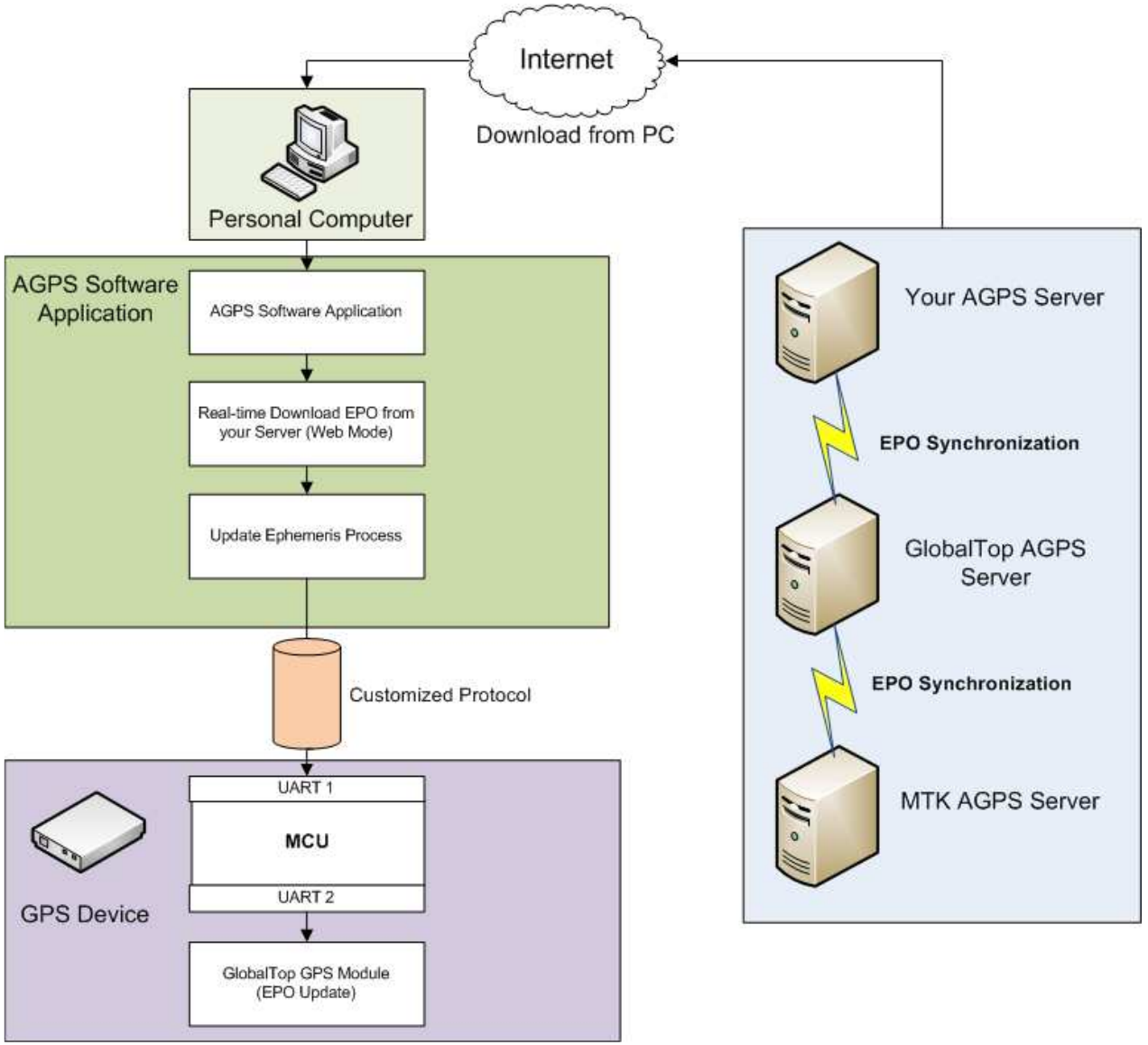
MTK EPO Protocol



- In a typical system design, a single MCU is responsible for all the IOs communications between the device and the computer platform.

- ✓ We provide the standard AGPS EPO data update software application for use with Windows PC in EV-Kit or single module, as well as MTK EPO protocol and command so you can design your own updating scheme.

AGPS System Infrastructure Example



GlobalTop AGPS Compatibility

GlobalTop GPS Module with AGPS (EPO in flash) Function Availability

- AGPS is available on GlobalTop GPS Module with the following:
  - MT3318 GPS Chipset with Firmware version **Mcore 2.02** or higher
  - MT3329 GPS Chipset with Firmware version **AXN 0.3** or higher
  - MT3339 GPS Chipset with Firmware version **AXN 2.10** or higher
  - MT3333 GPS Chipset with Firmware version **AXN 3.10** or higher

Product Series	Model Number	GPS Chipset
PA Series	FGPMMOPA2	MT3318
	FGPMMOPA4	
	FGPMMOPA6B	MT3329
	FGPMMOPA6E	
	FGPMMOUDG	
SL Series	FGPMMOSL1B	MT3318
	FGPMMOSL3	
Gms Series	Gms-u1LP	MT3329
Gmm Series	Gmm-u1	MT3329
u5 Series	Gmm-u5LP	MT3329

Product Series	Model Number	GPS Chipset
PA Series	FGPMMOPA6C	MT3339
	FGPMMOPA6H	MT3339
SL Series	FGPMMOSL3C	MT3339
Gms Series	Gms-u6b	MT3339
	Gms-g6a	MT3339
	Gms-g9	MT3333
Gmm Series	Gmm-u2p	MT3339
	Gmm-g3	MT3333

Important Requirements

Important Requirements for Implementing AGPS Function to your Device:

- MTK EPO Protocol with regard to AGPS Function.
  - You need to request MTK EPO Protocol in implanting AGPS function to your device.
- The external communication port's baud rate for your MCU must match the standard baud rate of GlobalTop's GPS module (varies by models).

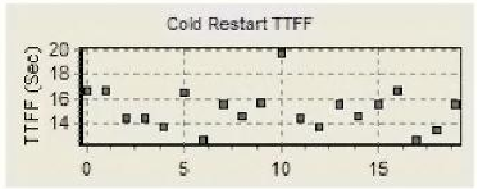
AGPS Specifications

EPO Download Frequency:	Once Every 7-days/14-days
Data Validity Period:	7-days (MT3329) 7-days/14-days (MT3339/MT3333)
Data Size:	52.5K bytes (7-days) or 105K bytes (14-days)
EPO Retrieval Method during Startup:	Retrieval from pre-downloaded EPO data into GPS internal flash memory
Storage Method:	GPS chip internal flash
Accuracy:	CEP < 100m 7 days

AGPS Performance Testing Data

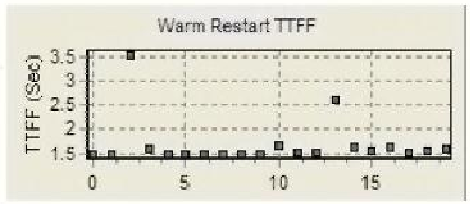
CTTFF

	2D-10km	2D-600m	2D-100m	3D-100m
TTFF	15.6	15.6	15.6	16.6
Tests	20	20	20	20
Mean	15.1	15.1	15.1	15.6
Max	19.7	19.7	19.7	19.7
Min	12.6	12.6	12.6	12.6
67%	15.6	15.6	15.6	16.5
90%	16.6	16.6	16.6	16.6
95%	16.6	16.6	16.6	17.6
99%	19.7	19.7	19.7	19.7



WTTFF

	2D-10km	2D-600m	2D-100m	3D-100m
TTFF	1.6	1.6	1.6	2.6
Tests	20	20	20	20
Mean	1.7	1.7	1.7	2.6
Max	3.5	3.5	3.5	3.5
Min	1.5	1.5	1.5	1.5
67%	1.6	1.6	1.6	2.6
90%	1.7	1.7	1.7	2.7
95%	2.6	2.6	2.6	2.7
99%	3.5	3.5	3.5	3.5



TTFF Test Data

- Majority of modules (90%) with AGPS can fix within 15 seconds during a Cold Restart.
- Majority of modules (90%) with AGPS can fix within 1 seconds during a Warm Restart.

Summary

- What we can do for your next AGPS capable device:
  - ✓ The ability to access and retrieve the latest EPO data to your own customized server.
  - ✓ MTK EPO Protocol for updating EPO data.
  - ✓ Software coding assistance for implementing AGPS update function to your application.

Thank You For Considering GlobalTop!

If you are interested in implementing AGPS solution to GlobalTop GPS Modules, or have questions regarding technological aspects of AGPS, please feel free to contact us!

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