G7A GNSS Module

A-GNSS Application Guide

Issue 1.0 Date 2019-08-07

Notice

This document provides guide for users to use G7A GNSS Module .

This document is intended for system engineers (SEs), development engineers, and test engineers.

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About This Document

Scope

This document is applicable to G7A GNSS Module series.

Audience

This document is intended for system engineers (SEs), development engineers, and test engineers.

Change History

Issue	Date	Change	Changed By
1.0	2019-07	Initial draft	Sandy Song

Conventions

Symbol	Indication
!	This warning symbol means danger. You are in a situation that could cause fatal device damage or even bodily damage.
!	Means reader be careful. In this situation, you might perform an action that could result in module or product damages.
i	Means note or tips for readers to use the module

1 Overview

Neoway G7A module is a GNSS module developed on ICofChina chipset. The Assisted-GNSS (A-GNSS) function helps to shorten the period of first position fix by importing GPS ephemeris data through the UART port. Especially in the scenarios where signals are poor and ephemeris data is difficult to receive, A-GNSS can improve the performance of the first position fix obviously. This document describes the details of the A-GNSS solution used on G7A.

2 A-GNSS Architecture
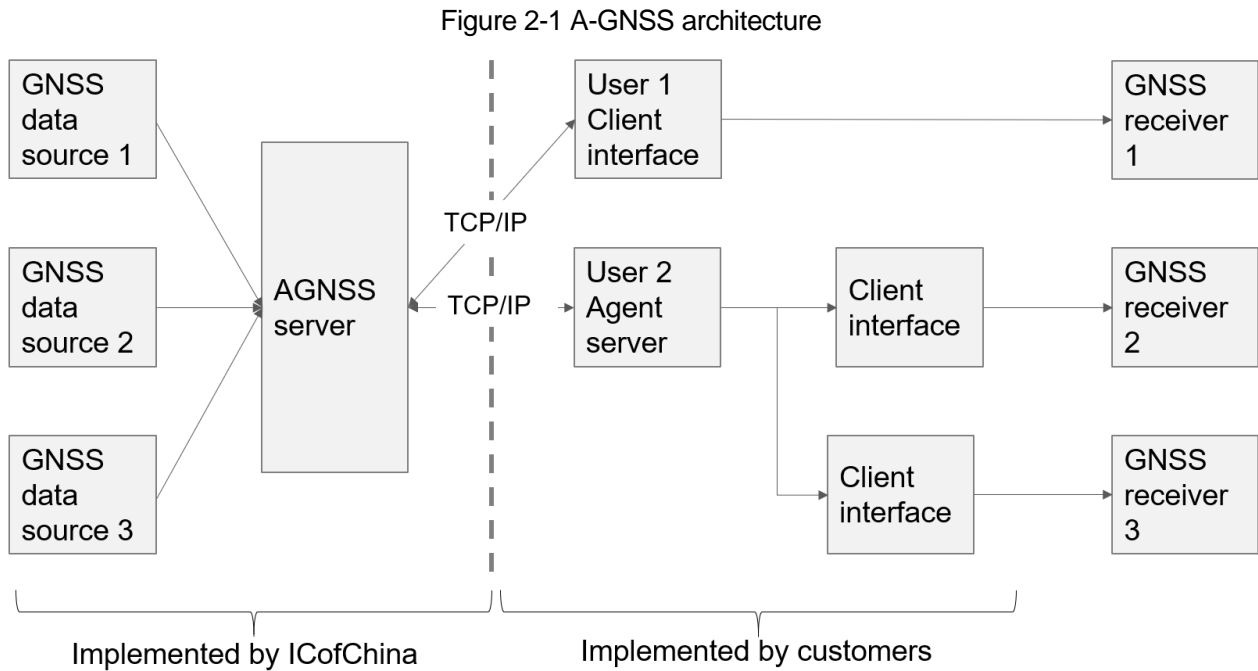
Figure 2-1 A-GNSS architecture

Figure 2-1 shows the architecture of the A-GNSS solution. The A-GNSS server aids information such as time, GPS ephemeris, GPS almanac, ionosphere correction parameters, and UTC leap second correction parameters. Clients obtain aid data from the A-GNSS server through the TCP/IP protocol, and the data is transmitted to the ICofChina chip to implement the A-GNSS fast positioning function.. Customers can set up an agent server to facilitate device management.
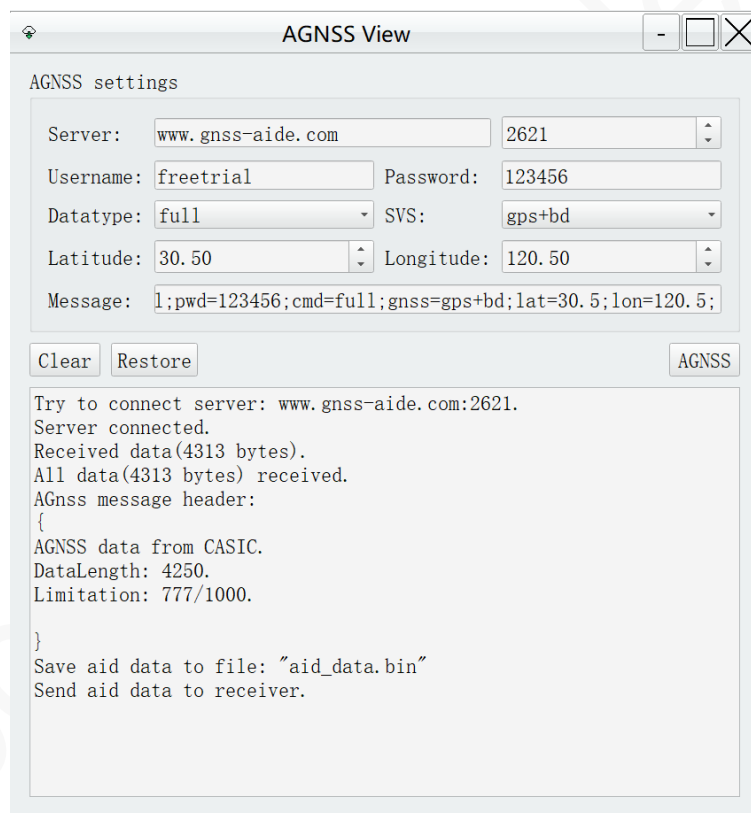
3 A-GNSS Operation Process

This chapter describes the operation process of A-GNSS.

3.1 Connecting to A-GNSS Server

The server address is 121.41.40.95 (www.gnss-aide.com) and the port is 2621.

A free account is available. If you need a formal account, please contact ICofChina.

The following screenshot shows an example of connection on GnssToolKit3.

A-GNSS type: online AGPS. Clients send a data request and the server replies with AGPS data.

It is recommended to enable the client to request data every time when the GNSS module is started.

3.2 Sending A-GNSS Request

The client sends a request to the A-GNSS server. The request statement is a composition of multiple sets of key=value;

For example, user=freetrial;pwd=123456;cmd=full;lat=60.0;lon=55.0;alt=0;

The following table shows the parameters and values.

Parameter	Description	Value Range	Default Value	Remarks
user	User name, used for authentication	A character string, the length of which does not exceed 30	N/A	Mandatory
pwd	Password, used for authentication	Character string	N/A	Mandatory
cmd	Data Type	full, eph, aid*	full	Optional
lat	Latitude	-90-90, unit: degree	0	Optional
lon	Longitude	-180-180, unit: degree	0	Optional
alt	Altitude	Unit: meter	0	Optional
x	Coordinate	Unit: meter	0	Optional
y	Coordinate	Unit: meter	0	Optional
z	Coordinate	Unit: meter	0	Optional
pacc	Precision		0	Optional

3.3 Format of Data Returned by Server

The server returns data that consists of three parts: data flag, data length, and data content.

<LF> indicates \n in ASCII format.

- Data Flag
  Type: ASCII character string
  Format: AGNSS data from CASIC.<LF>
- Data length
  Type: ASCII character string
  Format: Data Length: n.<LF>
  n: indicates the length of the data
- Data content
  Type: binary data
  Format: start with 0xBA, 0xCE

4 Example

The following shows an sample Python code of A-GNSS application.

Variant definition

```
addr = '121.41.40.95' # server address
port = 2621  #port
message = 'user=freetrial;pwd=123456;cmd=full;lat=30;lon=120;' #request message
```

Server connection

```
import socket
socket.setdefaulttimeout(4)
client = socket.socket()
client.connect((addr, port))
```

Sending request message

```
client.send(message)
```

Receiving response from server

```
reply_data = ''
while True:
current_reply = client.recv(1024)
if len(current_reply) == 0:
break
else:
reply_data += current_reply
```

Sending response from server to GNSS module

```
import serial
tty = serial.Serial()
tty.port = 'COM1'
tty.baudrate = 9600
tty.open()
tty.write(reply_data)
tty.close()
```