

JK-GPS

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Overview

The JK-GPS is an easy to use GPS device that can bring global positioning to any application quickly and with low cost. It outputs several different NMEA strings to give accurate information on time and location. Easy industry standard connectors speed the time to market for your product.

Features

- 5V DC regulated power input
- NMEA serial output at 2400 8-N-1
- Low power consumption, 70mA @ 5V
- Fast bootup time
- Jumper selectable for RS232 or TTL output
- Rugged SMB antenna connector

Getting Started

To begin development with the JK-GPS standalone version, you will need a PC compatible computer with a telecommunications program and a free serial port. Connect the JK-GPS serial port to the PC's serial port with a 9-pin serial cable. Run the telecommunications program and configure the serial port for 4800 baud, 8 data bits, 1 stop bit and no parity. Apply power to the JK-GPS using our A/C adapter PN 88-0000 or a source of regulated 5V DC power.

If you are using the JK-GPS for the DataMover simply run the con2gps program at the prompt.

Once the console has been attached and power applied the JK-GPS will begin outputting information on the serial port. If you do not get characters on the serial port, you need to check your serial port setup. To test everything but the JK-GPS, remove the serial cable from J2 and jumper pins 2 and 3. If characters typed on the keyboard are not echoed on the screen, the problem is with your setup. You must resolve the problem before you can continue.

A sample output is below:

```
$GPGGA,000018.000,0000.00000,N,00000.00000,E,0,00,99.0,082.00,M,18.0,M,,*57
$GPVTG,0.0,T,,M,0.0,N,0.0,K*60
$GPGSA,A,1,,,,,,,,,,,,,99.0,99.0,99.0*00
$GPGSV,3,1,12,05,00,000,47,09,00,000,,25,00,000,,27,00,000,*75
$GPGSV,3,2,12,19,00,000,,08,00,000,,22,00,000,,30,00,000,*78
$GPGSV,3,3,12,02,00,000,,06,00,000,,03,00,000,,31,00,000,*7F
$GPGLL,0000.000,N,00000.000,E,000018.000,V*2A
$GPGGA,000019.000,0000.00000,N,00000.00000,E,0,00,99.0,082.00,M,18.0,M,,*56
```

Software

The JK-GPS outputs several formats of information in NMEA format. It is important to understand these different statements in order to get your application working.



****Warning****

The JK-GPS requires some time to get a position fix with the GPS system. This takes approximately 90 seconds to attain, before data is valid. If your data is not valid within 2 minutes you need to check your antenna setup.

All of the NMEA statements begin with a '\$' character and a descriptor for the type of statement. Each statement ends with a '*' character followed by a two character checksum, and a '<CR>' '<LF>'. Within each statement, fields are separated by commas.

The first statement of note is the GPGGA:

```
$GPGGA,205952.000,3832.93403,N,12144.03045,W,1,06,1.7,013.70,M,-23.2,M,,*5B
```

In the first field following the '\$' we can see that this is a GPGGA statement.

The next field displays the time (205952.000) in UTC. This field can be particularly useful during setup, as it is usually the first to be established. Checking for this field being accurate can be an easy fast check to see if a satellite fix has been established.

The following two fields list the Latitude and orientation, in this case 38 degrees and 32.93403' North. Similarly Longitude is listed next at 12 degrees and 144.03045' West.

Next is information on the satellites, the first being fix quality. A zero value means it is invalid, and a 1 (as seen here) indicates a GPS fix. The following number is the number of satellites being tracked, in this case six.

The field with 1.7 indicates the Horizontal dilution of position.

Next we have the Altitude (13.70) and the following M field indicates it is in meters. Similarly the height of the geoid (-23.2) is also given in meters. The final two fields are blank, followed by the star and checksum indicated the end of the GPGGA statement.

If you need to know about movement, then the GPVTG statement is useful:

```
$GPVTG,0.0,T,,M,0.1,N,0.2,K*63
```

The first field after the statement type is the Track Made Good, followed by a T field to indicated that it is relative to true North.

The next two fields, the blank and the M can be ignored.

The field containing 0.1 followed by an N indicates speed in knots over ground. Similarly the next field, 0.2, indicates the speed in kilometers per hour.

Finally we see the star character and the checksum, indicating the end of the statement.

You may also see commands of type GPGLL or GPGSA. GPGLL statements do not have any additional information. GPGSA statements can be used to identify the SVs used in position fix.

Hardware

Cables and Connectors

J2 - SMB Antenna connector

****Warning****



The JK-GPS MUST have an antenna attached and positioned properly in order to get accurate data. This antenna will need to be clear from any obstruction in order to get a fix on the satellites for proper positioning data which may mean placing it outside in many applications.

| | J1 | | | Serial | | |
|------|----|----|------|--------|--|--|
| 3.3V | 1 | 2 | GND | | | |
| Tx | 3 | 4 | GND | | | |
| Rx | 5 | 6 | BATT | | | |
| GND | 7 | 8 | NC | | | |
| GND | 9 | 10 | +5V | | | |

| | J3 | Power |
|---|----|--------|
| 1 | | + 3.3V |
| 2 | | JTAG_I |
| 3 | | JTAG_O |

Jumpers

JP1 : RX Control

This jumper selects whether the RX pin TTL level (pins 2-3) or RS232 level (pins 1-2)

Default: 1-2, RS-232 level

JP2 : TX Control

This jumper selects whether the RX pin TTL level (pins 2-3) or RS232 level (pins 1-2)

Default: 1-2, RS-232 level

Specifications

Power Supply: 5 VDC +/- 5% regulated, 0.5W (nominal)
Operating Temperature: -40 to +70 °C

Mating Connectors:

| Connector | Mfg | MFG P/N | Mfg | MFG P/N | JK micro P/N |
|---------------------------------|-----------------------|------------|--------|-------------|--------------|
| 2x5 Housing (J1) | Molex | 22-55-2101 | Oupiin | 4072-2X05H | 28-0030 |
| Pins | Molex | 16-02-0096 | Oupiin | 404-PIN-10K | 28-0033 |
| 1x3 Housing, Friction Lock (J3) | Molex | 22-01-2031 | Oupiin | 4071-03H | 28-0012 |
| Pins, Friction Lock Housings | Molex | 08-50-0114 | Oupiin | 4071-PIN-T | 28-0013 |
| SMB (J2) | Amphenol 903-579P-51S | | | | |

Mechanical:

Dimensions 3.41" x 2.49" x 0.67"
86.6mm x 63.2mm x 17.0mm

Weight 0.071 lbs
32.2 grams

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