



Toshiba HHGP1 Instruction Manual

Gps receiver unit

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TOSHIBA
INSTRUCTION MANUAL
GPS RECEIVER UNIT
HHGP1

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(Ver. 1.6)

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Summary of Contents for Toshiba HHGP1

[Page 1](#) 6 F 2 S 0 7 3 8 INSTRUCTION MANUAL GPS RECEIVER UNIT HHGP1 © TOSHIBA Corporation 2001 All Rights Reserved. (Ver. 1.6)

[Page 3: Safety Precautions](#)

Before using this product, please read this chapter carefully. This chapter describes the safety precautions recommended when using the GPS receiver unit type HHGP1. Before installing and using the equipment, this chapter must be thoroughly read and understood. Explanation of symbols used Signal words such as DANGER, WARNING, and two kinds of CAUTION, will be followed by important safety information that must be carefully reviewed.

[Page 4](#) 6 F 2 S 0 7 3 8 DANGER • Installing arrester Install a surge arrester between the antenna and the GPS receiver and ground it in accordance with the guidelines in this manual. Otherwise, it may cause electric shocks, injury or malfunction.

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Contents Safety Precautions Introduction Characteristics Configuration 3.1 Configuration of GPS Receiver Unit 3.2 Outline of GPS Receiver Unit and Function Handling 4.1 Setting the GPS Receiver Unit 4.2 How to Turn on the Power 4.3 Checking the 1PPS Signal Operation 5.1 1PPS Signal Output 5.2 Time Data Output Installation...

[Page 6](#) Appendix A Outline of GPS Receiver Unit Appendix B Technical Data Appendix C Specification of Recommended Antenna and Arrester Appendix D Supplement The data given in this manual are subject to change without notice. (Ver. 1.6) □ 4 □ 6 F 2 S 0 7 3 8...

[Page 7: Introduction](#)

1. Introduction The GPS (Global Positioning System) receiver unit is a device that receives the information from satellites and outputs time signals synchronous to UTC (Universal Coordinated Time) to external devices. The GPS receiver unit provides multiple outputs with optical signals for noise immunity.

[Page 8: Configuration](#)

3. Configuration 3.1 Configuration of GPS Receiver Unit Figure 3.1.1 shows the configuration of the GPS receiver unit. The GPS receiver unit receives electromagnetic signals from satellites through an antenna and outputs time data to external devices. Through an internal receiver, the unit generates serial time data and 1-second pulses (1PPS signals), based on the received electromagnetic signal.

[Page 9: Outline Of Gps Receiver Unit And Function](#)

3.2 Outline of GPS Receiver Unit and Function Figure 3.2.1 shows outline and functions of GPS receiver unit. FRONT VIEW REAR VIEW Device Yellow LED ① Yellow LED ② Red LED ③ DIP switches ④ Signal output ports ⑤ Power supply switch ⑥...

[Page 10: Handling](#)

4. Handling 4.1 Setting the GPS Receiver Unit The GPS receiver unit is set in accordance with the requirements of the system by using the DIP switches located on the front panel of the unit. To prevent erroneous operations, the DIP switches are protected with a cover. As shown in Figure 4.1.1, when the cover is rotated after loosening the cover screw with a screwdriver, the switches are exposed thus making it possible to handle them.

[Page 11: How To Turn On The Power](#)

Switch Note: Settings can be changed when the power is ON, but changes are not valid until the power has been switched OFF and ON again, except in the case of switch 3 for optical level testing, which is valid immediately. In the case of location mode, the location estimation mode (OFF) should be used.

[Page 12: Operation](#)

5. Operation 5.1 1PPS Signal Output The GPS receiver unit outputs 1PPS signals with each pulse defining the instant of time described by the preceding frame of serial data. (For the time signal

transmission format, refer to Appendix D.) Following power-up, the GPS receiver begins outputting 1PPS signals after the acquisition of the almanac data and the estimation of the receiver location (or the antenna location to be more exact) are completed.

[Page 13: Time Data Output](#)

Number of receivable satellite signals Power ON Almanac data reception (12 to 30 minutes)
Figure 5.1.1 5.2 Time Data Output On power-up, time data (serial data consisting of year-month-date and hour:minute:second) is output from the receiver's internal RTC (real time clock). If satellite signals are received, then time data transmitted by the satellite (i.e., GPS time) is output until acquisition of the almanac data is completed.

[Page 14: Installation](#)

6. Installation 6.1 Receipt of GPS Receiver Unit When GPS receiver units are received, carry out the acceptance inspection immediately. In particular, check for damage during transportation, and if any is found, contact the vendor. Always store the GPS receiver units in a clean, dry environment. 6.2 Installing GPS Receiver Unit CAUTION Do not remove flanges from the main unit, as this may cause a failure.

[Page 15](#) Don't locate in shade of obstructing objects (Box, antenna, etc.). Next, connect the antenna to the arrestor with a coaxial cable. The following antennas are recommended: GPA-014B or GPA-017S manufactured by Furuno Electric Co., Ltd. The specifications for and dimensions of these antennas are described in Appendix C.

[Page 16](#) Debe clamp Fix the cable to the support cable by making a circle while making sure the cable is long enough. Support pole (φ38 to 64 Figure 6.3.2 An Example of Installation, Using GPA-014B for Antenna (A) Leave the connector slightly loose so that no excessive force is applied.

[Page 17: Installing Surge Arrester](#)

6.4 Installing Surge Arrester The GPS antenna must be installed outdoors, so a surge arrestor is required as a measure against induced surges due to lightening. (This is not effective against a direct lightening strike.) The arrestor should be installed at the point where the coaxial cable from the antenna enters the building.

[Page 18: Connecting The Power Supply And The Earthing Terminal](#)

6.6 Connecting the Power Supply and the Earthing Terminal Connect the 48Vdc power cable and the earth cable to the terminal block with M4 crimped terminals. For safety purposes, make sure that the earth connection is reliable. CAUTION The earthing terminal must be securely earthed. The failure to ground may cause malfunctions, electric shocks or injury.

[Page 19: Preparation For Installation](#)

7. Preparation for Installation The following issues should be considered prior to commencing installation of the system. 7.1 Selecting an Antenna and Cables The choice of antenna and cable types should be made based on the distance from the antenna installation site to the GPS receiver unit installation site, and also on the cabling conditions.

[Page 20: Selecting An Antenna Installation Location](#)

7.3 Selecting an Antenna Installation Location CAUTION If antenna is not located in the method described below, it may not be possible to receive the GPS signal correctly. Support pole □fix to fence etc.□ The antenna is installed outdoors to receive satellite transmissions. It should be installed in a location that offers an unobstructed view of the sky with an elevation angle of 15 degrees to horizontal.

[Page 21: Maintenance](#)

8. Maintenance 8.1 Regular Maintenance Surge arrestors are degraded by lightening induced voltages, resulting in changes to their discharge breakdown voltage. They require periodic checks and should be replaced if necessary. They can be checked by removing the internal components from the arrestor cabinet. The glass pipe part should be inspected and if it has turned black then replacement is required.

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[Page 23](#) 6 F 2 S 0 7 3 8 Appendix A Outline of GPS Receiver Unit □ 21 □...

[Page 24](#) 6 F 2 S 0 7 3 8 Outline 162.5 140.0 260.0 12.5 70.0 45.0 12.5 4-R3.5 290.0 308.0
Panel cutout 4-φ7 hole □ 22 □...

[Page 25: Appendix B Technical Data](#)

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[Page 26](#) TECHNICAL DATA Ratings DC power supply: AC ripple on dc supply IEC 60255-11: DC supply interruption IEC 60255-11: Permitted duration of dc supply voltage interruption to maintain normal operation Mechanical design Weight: Installation: Receiving function Number of receiving satellites: Receive signals: Receive frequency: Time transfer accuracy Within±2μs with respect to UTC□When the receiver is tracking GPS Satellites□...

[Page 27](#) Environmental Performance Claims for GPS Receiver Test Atmospheric Environment Temperature IEC60068-2-1/2 Humidity IEC60068-2-3 Mechanical Environment Vibration IEC60255-21-1 Shock and Bump IEC60255-21-2 Seismic IEC60255-21-3 High Voltage Environment Dielectric Withstand IEC60255-5 High Voltage Impulse IEC60255-5 Electromagnetic Environment High Frequency IEC60255-22-1 Class 3 Disturbance / Damped Oscillatory IEC61000-4-12,...

[Page 28](#) Surge Immunity IEC61000-4-5, EN61000-4-5 Conducted and EN55022 Class A Radiated Emissions Power Frequency IEC61000-4-8, Magnetic Field EN61000-4-8, Class 4 Pulsed Magnetic Field IEC61000-4-9, EN61000-4-9, Class 5 Damped Oscillatory IEC61000-4-10, Magnetic Field EN61000-4-10, Class 5 European Commission Directives 89/336/EEC 73/23/EEC 1.2/50μs surge applied to PSU terminals in common/differential modes: 2kV/1kV (peak) Conducted emissions: 0.15 to 0.50MHz: <79dB (peak) or <66dB (mean)

[Page 29: Appendix C Specification Of Recommended Antenna And Arrester](#)

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[Page 30](#) Recommended Antenna Type Manufacturer FURUNO Electric Co.,Ltd. Operating connector Applicable connector Gain Preamplifier noise index No more than 2.1dB Supply voltage Current consumption Operating temperature - 30 to + 80°C Storage temperature - 40 to + 85°C Weight Approx. 300g φ42.2 GPA□014B GPA-014B...

[Page 31](#) Recommended Arrester Type Manufacturer Frequency range VSWR Loss Withstand power Discharge breakdown voltage Impulse wave discharge voltage Impulse wave current endurance Impulse wave repetitive discharge endurance Insulation resistance at 100Vdc Connector Dimensions Weight EARTH CABLE φ2.5 – φ3.2 CA□23RS CA-23RS DAI-ICHI DENPA KOGYO CO., LTD.

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[Page 33: Appendix D Supplement](#)

6 F 2 S 0 7 3 8 Appendix D Supplement □ 31 □...

[Page 34](#) Time Signal Transmission Format The time signal format is shown below, consisting of 4,800bps serial data indicating the time, and 1PPS timing signal indicating the instant of time corresponding to the serial data. Serial data 4800bps Signal code format: Output data: Date Rollover The GPS week number sent from the satellite returns to 0 (i.e., rollover) every 19.6 years;...

[Page 35](#) 6 F 2 S 0 7 3 8 pulse. If the necessary number of satellites are available then the unit carries out error detection and removal of erroneous signals. In the event of two or more satellites in error, the operation is not assured.

[Page 36](#) Modified Figure 6.6.1. Modified descriptions in Section 7.1. Modified Appendices B, C, I and K. Corrected Type of GPS unit. (HHGP3 →HHGP1) Modified descriptions in Section 4.1. Modified descriptions Of “2. Date rollover” in Appendix D. Corrected Type of GPS antenna.

