

ALPHA DG1

GNSS EXCAVATOR
GUIDANCE SYSTEM





Introduction

ALPHA DG1 is a professional excavator guidance system developed to improve digging accuracy, increase productivity, and simplify daily jobsite operations. By combining high-precision positioning, sensor integration, and intuitive SmartSite software, the system gives operators real-time visual support for excavation, leveling, trenching, and slope work.

Designed for practical use in construction environments, ALPHA DG1 helps reduce rework, minimize over-excavation, and improve overall workflow efficiency. Its compact hardware, straightforward installation, and operator friendly interface make it a reliable solution for contractors seeking better control, faster execution, and more consistent results across a wide range of earthmoving applications.

Main Functions

Leveling

Supports accurate bucket elevation guidance for flat surfaces and reference-based leveling work. Ideal for pad preparation, site leveling, and foundation areas .

Trenching

Assists operators in creating straight and consistent trench profiles. Suitable for utility lines, drainage channels, and pipeline installation.

Slope Work

Provides guidance for controlled slope excavation and trimming. Helps improve accuracy on inclined surfaces and complex grading tasks.

Complex Surface Guidance

Supports work on irregular or variable surfaces where precision and continuous position feedback are required.

Basic Points and Lines

Allows operators to work from points, lines, and simple references for standard excavation layouts and straightforward construction tasks.



System Composition

Standard ALPHA DG1 configuration may include:

- GNSS receiver
- Sensor
- SmartSite software
- Mounting accessories
- Connection and installation components
- Protective transport case

Optional items may vary depending on machine type and project requirements

GNSS Receiver

SmartSite Software

Sensor



REDUCED SURVEYING DEPENDENCY

Ready to use after startup, helping reduce repeated surveying and manual checks during construction.



COST-EFFECTIVE PERFORMANCE

Improves efficiency and lowers costs, delivering strong value and return on investment.



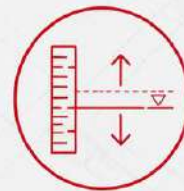
WIRELESS INSTALLATION

Magnetic, non-intrusive installation with reliable wireless connectivity.



VISUALIZED WORKFLOW

Cut-and-fill and excavation values are displayed in real time for easier operation.



PRECISE ELEVATION CONTROL

Supports precise elevation guidance for more visible, consistent grading results.

System Advantages

Fast setup and easy operation

ALPHA DG1 is designed for quick installation and straightforward operation. Its intuitive interface helps operators become productive with minimal training.



Better control of cut and fill

Real-time excavation data helps improve material control, reduce over-excavation, and support more efficient project execution.



Cost-effective performance

By improving accuracy and reducing wasted time and material, ALPHA DG1 contributes to lower project costs and better return on equipment investment.



Reduced dependence on manual staking and repeated checking

With guidance information available directly in the cab, operators can work more independently and reduce interruptions during excavation.



Visualized construction workflow

The software presents excavation data in a clear and practical format, helping operators understand the job target and current bucket position at a glance.





Software Overview

ALPHA DG1 features a professional, operator-friendly SmartSite software platform that combines excavator guidance, project management, and field measurement tools in one system. Designed for practical jobsite use, it helps operators work with greater speed, clarity, and control.

- **Clean and intuitive interface for fast operation**
- **Multiple guidance modes for leveling, ditching, slope work, lines, and surfaces**
- **Real-time GNSS and sensor status monitoring**
- **Full surveying capability with pole-mounted GNSS Host**
- **Measurement Tools for field data collection**
- **Project file import support: DXF, XML, SJW**
- **Integrated workflow for guidance, measurement, and project execution**

Its interface is designed to make essential information easy to understand in the field, even during demanding site conditions.

Specification >>>

GNSS Receiver

GNSS Performance	
Channels	1408
Signals tracking	GPS: L1C/A, L2C, L2P, L5 GLONASS: G1, G2, G3 BDS: B1, B1C, B2, B2a, B2b, B3 GALILEO: E1, E5a, E5b, E6 QZSS: L1, L2, L5 SBAS: L1 C/A L-Band: B2b (BDS PPP), E6B (HAS)
Cold start	<60s
Hot start	<15s
Positioning output rate	1~20Hz
Signal reacquisition	<1s
RTK initialization	<10s
Initialization reliability	99.99%
Time accuracy	20 ns
Accuracy	
Code differential GNSS positioning	H: 0.25m + 1ppm RMS V: 0.50m + 1ppm RMS
RTK surveying	H: 8mm + 1ppm RMS V: 15mm + 1ppm RMS
Tilt compensation	Update rage: 400 Hz Compensation range: 0 – 120 ° Accuracy: <2.5 cm within 120°
Communications	
I/O interface	Type-C USB SIM card slot (Nano) UHF antenna interface
Bluetooth	Dual-mode Bluetooth module, supports SPP and BLE
Cellular network	Multi-band 4G cellular communication module Region: EMEA/APAC LTE FDD: B1/3/5/7/8/20/28 LTE TDD: B38/40/41 (120M) WCDMA: B1/5/8 GSM/GPRS/EDGE: 850/900/1800MHz
Radio module	Operating frequency: 410-470 MHz Duplex mode: Half-duplex Modulation: CSS/GFSK/4FSK Protocols: Trintalk/TransEOT/Trimmark III/South/Satel GFSK spacing: 12.5 KHz/25 KHz LoRa spacing: 250 KHz RF output power: 0.5W/1.5W selectable
Differential format	RTCM3.x
Data output format	NMEA-0183
Electrical	
Battery	7.4V, 3500 mAh Li-ion battery
Battery life	Data collector internet mode: >12 hours Device internet mode: >10 hours Internal UHF mode: >9 hours
Physical	
Dimensions	82mm×82mm×89.3mm
Weight	430g
Operating temperature	-40°C ~+75°C
Storage temperature	-55°C ~+85°C
Waterproof/Dustproof	IP67
Humidity	100% non-condensing

Core Sensor

Pitch /Roll Performance	
X-axis range	+180°
Y-axis range	+90°
Tilt accuracy	0.2°
Resolution	0.0055°
Temperature drift	+0.2°(-40°C to +85°C)
Environmental/ Electrical	
Power consumption	130mA@3.3V
Operating temperature	-40°C to +85°C
Storage temperature	-40°C to +90°C
Maximum storage temperature	+100°C
Humidity	95%, non-condensing
Category	
UART baud rate	4800 bps to 230400 bps
Output data	On-board time, 3-axis acceleration, 3-axis angular velocity, 3-axis magnetic field, 3-axis angle
Output rate	0.2 Hz to 200 Hz
Startup time	1000 ms
Shock resistance	20000 g
Physical	
Dimensions	86mm×68mm×52.3mm
Weight	300g

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