

# **Max EM3**

Underwater Electromagnetic Receiver

# **ZQMax EM3**

### Underwater Electromagnetic Receiver

### QuasarGeo QMax EM3

The Quasar Geophysical Technologies (QuasarGeo) QMax is an easily deployed, electromagnetic (EM) receiver designed for increased safety, reliability, and operational efficiency in subsurface oil and gas surveys. The QMax's instrumentation package produces horizontal electric and magnetic field data of equal or better fidelity than current technology, and offers vertical data equivalent to its horizontal data. In addition, QuasarGeo design improvements have created a system that requires fewer personnel and less time for deployment/ recovery than conventional technology, thus lowering the costs of surveys and increasing overall survey speed while still producing the most comprehensive and highest resolution survey data available in the market.

### **QMax Benefits**

### Operational Efficiencies & Safety

- · Compact magnetic coils & rugged electrodes are permanently installed in receiver
- Long sensing arms not necessary (environmentally noise limited without long arms)
- Electrodes can wet/dry cycle with no performance degradation and are UV tolerant
- Results suggest up to 35% faster sink and rise times due to an improved hydrodynamic form factor
- Single, hot-swappable module for batteries and data (eliminates need to access sensor electronics and increases turnover speed)
- Enables automated deployment/recovery (safer and faster)

#### **Data Quality**

- Full three-dimensional data (Ez & Bz data at the same fidelity as x & y data)\*
- Proprietary capacitive electrodes are inherently more reliable than Ag/AgCl electrodes
- Integrated sensor system reduces potential points of failure by eliminating on-deck assembly and special handling
- Electrode placement and orthogonality errors are eliminated by removing long electric field arms
- Short, solid-state arms can be added for greater sensitivity on a case-by-case basis
- Faster sink times may lead to improved drop accuracy due to less time in the water column

# **❷ QMax EM3**Optimize survey speed and quality

Compact receivers maximize operational efficiency, allowing for shorter deployment and recovery times than conventional technology. With this time savings, it's possible to deploy additional receivers for more comprehensive surveys and/or conduct more surveys in the same amount of time, without any compromise in data quality.

<sup>\*</sup> Simplifies data rotation and can enable better discrimination of the edges of structures

## QuasarGeo QMax EM3 Specifications

QuasarGeo QMax EM3	General
Primary Channels	6 (3E + 3B)
Auxiliary Channels	Temperature (internal), orientation (resolution 0.1°)
Operation Time	Up to 30 days (adjustable/customizable)
Power	Non-rechargeable lithium batteries (rechargeable upon request)

QuasarGeo QMax EM3	Mechanical
Maximum Operating Depth	4000 m/13,100 ft
Dimensions	<90 cm/35 in tall $\&{\sim}100$ cm/39 in diameter w/o arms (arms optional)
Weight in Air (w/o anchor)	160 kg/352 lbs (depends on features)
Weight in Air (w/anchor)	260 kg/572 lbs (based on -50 kg/110 lb buoyancy target)
Buoyancy (w/o anchor)	+16 kg/35 lbs (adjustable/customizable)
Buoyancy (w/anchor)	- 40 kg/88 lbs (adjustable/customizable)
Flotation Type	Syntactic foam
Release Type	Burn wire (customizable)

QuasarGeo QMax EM3	Acoustics
Туре	Long baseline transponder
Frequency	9 or 11 kHz interrogate, 12 kHz reply
Transmit Power	192 dB re. 1μPa
Receive Sensitivity	100 dB re. 1μPa-m
Operating Life	2 years or 40,000 replies
Ultra Short Baseline (USBL)	Bolt-on mount provided (USBL not included)

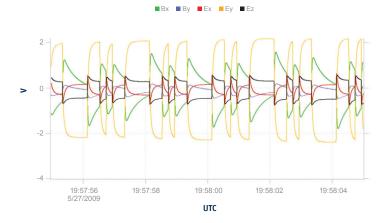
QuasarGeo QMax EM3	Recovery System
Method	Strayline float detaches on release (customizable)
Location Aids	VHF radio beacon and Xenon strobe/satellite beacon (optional)
Radio Frequency	154.585, 159.480, 160.725, 160.785 MHz
Radio Transmission Range	4 - 8 nautical miles
Strobe Visibility	Up to 4 nautical miles

QuasarGeo QMax EM3	Sensors & Analog Electronics (based on experimental data)
E-Field Bandwidth	0.001 Hz to 200 Hz
E-Field Horizontal Sensitivity	1.5 nV/m/rtHz @ 0.3 Hz, 0.7 nV/m/rtHz @ 2 Hz
E-Field Vertical Sensitivity	1.5 nV/m/rtHz @ 0.3 Hz, 0.7 nV/m/rtHz @ 2 Hz
B-Field Bandwidth	0.001 Hz to 200 Hz
<b>B-Field Horizontal Sensitivity</b>	150 fT/rtHz @ ≥ 1 Hz, 1 pT/rtHz @ 1 Hz
B-Field Vertical Sensitivity	500 fT/rtHz @ > 10 Hz, < 10 pT/rtHz @ 1 Hz
THD	-86 dB
Cross-Channel Isolation	90 dB
Dynamic Range	110 dB (estimated)
Phase Response	Calibration provided

QuasarGeo QMax EM3	Digital Electronics
Sampling Rate	400 Hz fixed, variable optional
A/D Resolution	24 bits
Clock Synchronization	GPS via NMEA message and 1 PPS
Clock Drift	< +/- 5 ms per day
Post-Recovery Clock Check	1 PPS outputs
Clock Aging	+/- 0.25 ms per day
Recording Start	Immediate start or programmed time
Storage Medium	SD Flash Memory
Storage Capacity	up to 32 GB adjustable/customizable
Data Storage Format	Industry standard
Data Time Tagging	Each block tagged with real time from GPS sync
Data Offload Procedure	Flash card can be removed with batteries or optional offload via bulkhead connector

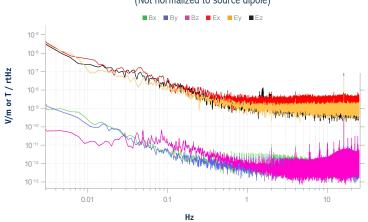
QuasarGeo QMax EM3	Software
Interface	Graphical, real-time displays
Displays	Time series, PSD, battery voltages
Diagnostics	On-deck system verification

### **QMax EM3 Linear Transmitter Time Series**



### QMax EM3 Voltage Noise

(Not normalized to source dipole)



## **MABOUT US**

### QUASAR GEOPHYSICAL TECHNOLOGIES

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QuasarGeo is a division of Quasar Federal Systems, part of the Quasar Group of companies. These employee-owned and financed companies work closely together to advance EM sensing systems in a variety of application areas.

QuasarGeo was formed to address the specific needs and requirements of resource exploration companies, especially the oil and gas industry, by supplying enhanced performance EM survey instrumentation including Magnetotellurics (MT) and Controlled Source Electromagnetic (CSEM) systems. QuasarGeo is an independent provider of EM technologies for geophysical applications.

As a member of the Scripps Institution of Oceanography Seafloor Electromagnetic Methods Consortium, QuasarGeo has access to the state of the art in scientific research, and exposure to current industry needs and expectations. For more information on QuasarGeo, visit www.QuasarGeo.com.







