

# TSR 4-TIME STAMP RECORDER 4

## RECORD "HIT" TIME AND POSITION

### FOR USE WITH AUTONOMOUS RECORDING SYSTEMS



#### FAST AND SIMPLE

The Time Stamp Recorder 4 (TSR 4) is designed to record the precise hit time and position for each shot. The GPS time and position of every hit is stored on a removable memory plug. This data is then used by the autonomous recording system to produce shot records.

#### The optional Navigation Application:

- Runs on Android device, including tablets and cell phones.
- Navigate source to preloaded points.
- Backs up TO times as they happen.
- Displays shot status information.
- Supports user with Red light or Green Light operation status.
- Adds real-time navigation with detailed map to the next source point.
- Operator can easily add comments to log their process.
- Log file automatically generated with all the shooting information, including shot line and station numbers, shot time stamps and GPS shot locations.

At the end of the day the Ruggedized USB-compatible Memory Plug can be removed to harvest data and create shot files with the autonomous recording system's data.



#### SECURECONNECT OPTION

With the SecureConnect option, the TSR 4 data is transmitted in real time from your Android device to the central system.

- Connects to Android device via Wi-Fi.
- Android tablet sends data to SecureConnect via cellular option.
- Sends shot time, position, line, station and status instantly.
- Data is encrypted and transmitted securely to the central system.
- Real-time shot monitoring and QC in SourceLink Software.
- Eliminates end-of-day data transfers.

#### FEATURES AND BENEFITS

- AUTONOMOUS**  
Just like any autonomous nodal system, this TSR 4 makes any impact source fully autonomous.
- PRECISION**  
Uses GPS to monitor all source locations and determine exact trigger times.
- NAVIGATION**  
Optionally, connect a TSR 4 to a tablet or cell phone to guide the source to the next shot point quickly and efficiently.
- REAL-TIME LOGGING**  
Connected to the Navigation App, the crew can add comments and creates their observer log as they shoot, increasing accuracy and reducing errors.
- SECURITY**  
With the optional Navigation App, all the shooting data, including locations and time stamps, is backed up as each shot point is acquired.
- COMPATIBILITY**  
The TSR 4 system creates a data harvesting file compatible with most autonomous recording seismographs.
- RELIABILITY**  
Never miss a shot time with the TSR 4 redundant storage using the Android Navigation App.
- SECURECONNECT (OPTIONAL)**  
Real-time wireless transmission of shot data to the central system for live monitoring in SourceLink Software.

#### USING THE TSR 4 WITH SECURECONNECT

- 1 Connect TSR 4 to the source's hammer switch.
- 2 Connect TSR 4 to Android tablet using internal Wi-Fi radio.
- 3 Start the Navigation App and load source points.
- 4 Navigate to next source point.
- 5 Fire the source. TSR 4 records hit time and GPS position.
- 6 Shot data is displayed and stored on the Android device.
- 7 SecureConnect receives data from the tablet via cellular.
- 8 Data is received and displayed in SourceLink Software.
- 9 Back in the office, tablet information is used for data harvesting, processing, and interpretation.



Live shot data and positions are available in SourceLink Software in real time.

#### TIME STAMP RECORDER 4 SPECS

Trigger Signal	TTL or Switch Closure
Trigger Input	Detects Negative Edge
Internal GPS	Standard
Internal Wi-Fi	Standard
External Memory	16 GB Ruggedized Plug
Cycle Time	2 mSeconds
Accuracy	±1 µSeconds
Weight	2.5 lbs. (1 kilogram)
Size	11.5 x 7.25 x 3.0 inches (292 x 184 x 76 mm)

#### TIME STAMP RECORDER 4 OPTIONS

##### Internal Lilon Battery

Battery:	99.9 watt-hour
Run Time:	> 72 hours

##### External GPS

Optional external submeter or centimeter accurate GPS receiver.

#### SECURECONNECT OPTIONS AND SPECS

##### Connection to Android

Wi-Fi	Standard
Bluetooth	Standard
USB	Standard

##### Cellular Options

4G LTE / 5G	Optional
Global SIM Support	Optional

##### Security

Encrypted Transmission	Standard
VPN Support	Optional

##### Power

Internal Battery	Standard
Run Time:	> 24 hours

#### SecureConnect Benefits

- Real-time data to central system
- Live QC and monitoring in SourceLink Software
- Improved safety and operational awareness
- Reduced remobilization and errors
- Complete shot record available instantly