

Preliminary



ESS is offering customizable miniature Ground Penetrating Radar (GPR) systems. Our systems have evolved through several generations and incorporate the latest technology. They offer reduced size weight and power parameters for custom applications that require adaptable, smart sensing. They are small enough to fit beneath conventional automobiles, trucks and construction equipment. Sample applications include infrastructure monitoring such as bridge decks, roadways, and railroads.

Modern electronics provide fully calibrated GPR systems for use in applications where finely tuned hardware can be used to determine material properties, perform construction verification, identify deteriorating infrastructure and more. We can fully customize our GPR hardware for your radar application. Our state of the art GPR systems and experience with advanced processing algorithms allow ESS to provide turn-key solutions for specific customer needs.

We have experience adding GPR to existing equipment and developing sensor packages to complement additional sensor suites.

Depending on the application, site conditions, and calibration information, a full waveform analysis can allow for determination of material properties such as:

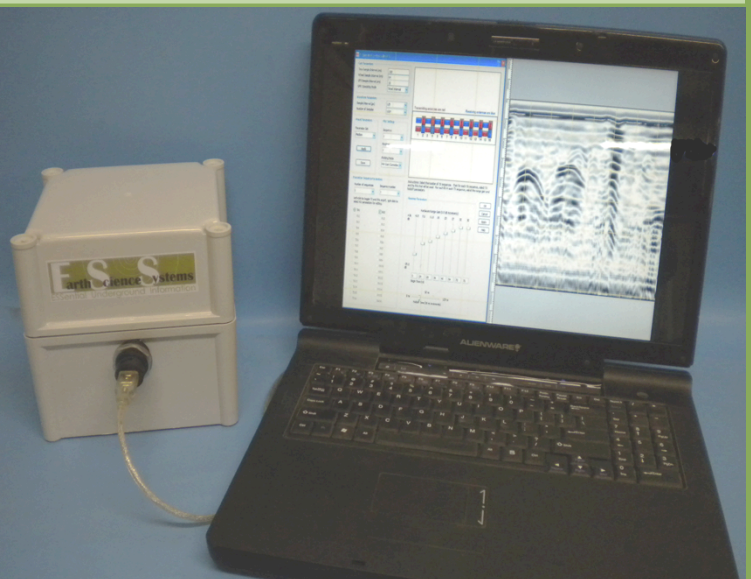
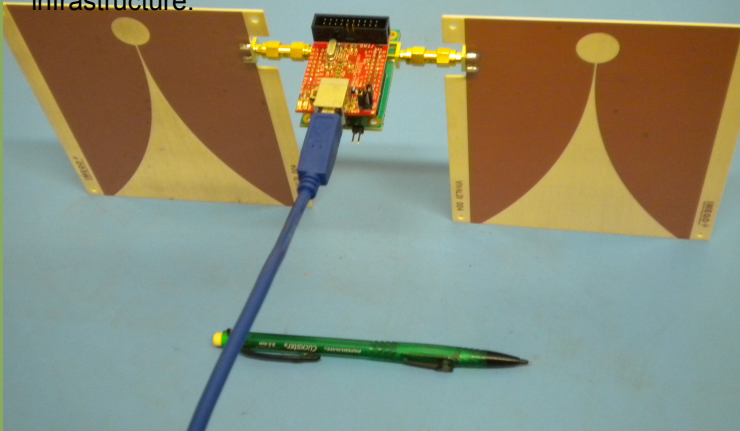
- moisture content
- grain size distribution
- density/compaction
- specific dielectric values

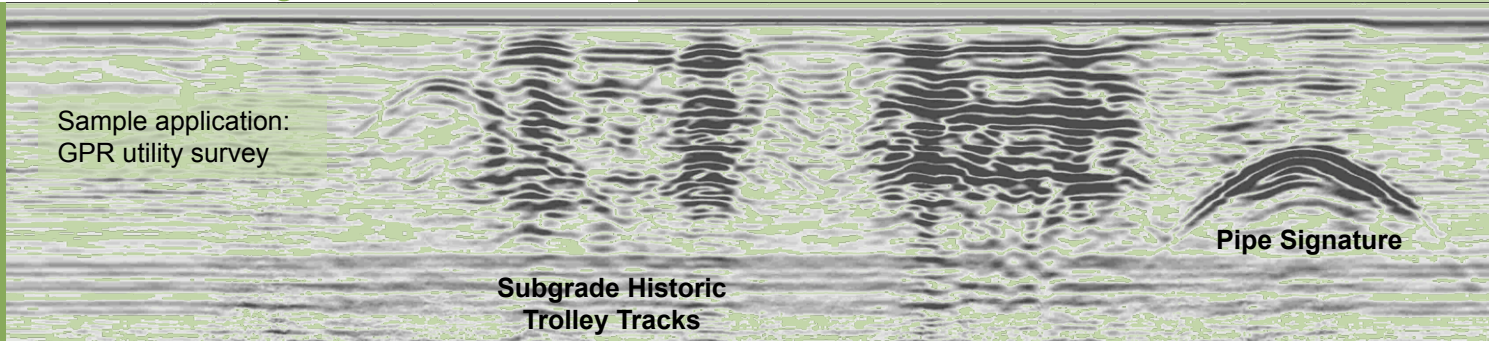
Sample features for detection include:

- Subsurface layer interfaces and thicknesses e.g. asphalt, concrete subgrade
- Reinforcing bar, post tension cables
- Clays or other fines
- Utilities, foundations, voids

Please contact us directly to discuss your specific radar needs so we can provide a custom solution for your application and budget.

ESS GPR systems have been developed for multiple uses including a National Institute of Standards and Technology sponsored project to assess roadway infrastructure.





Specifications

Time Domain Impulse Radar Systems

- (1) Low Frequency Range: 10-500MHz
- (2) High Frequency Range: 800MHz – 5GHz

Antennae

Custom antennas available
 Systems suitable for ground- and air-launch

Data Rate

USB 2.0 (or USB 3.0 for array)
 16 or 32 GHz Equivalent Time Sampling (ETS)
 14 bit digitization
 Switched attenuation and programmable gain
 Results in 3cm sampling at 100km/hr

Array Acquisition

16 transmitter (Tx) & 16 receiver (Rx) channels
 Simultaneous and synchronous multi-offset acq.
 Allows for diversity in frequency, ploarization and geometry
 Wheel encoder interface

Power

Input: 10-30V DC
 Typical Draw: <10W

Low Frequency: 1-100V pulser
 Up to 100 kHz pulse repetition frequency
 Up to 2kW peak power
 8GHz ETS

High Frequency: 3V pulser
 50 MHz pulse repetition frequency
 32GHz ETS

Dimensions

Antenna dependent
 2GHz undercarriage mounted system 25x17x15 (cm)

Acquisition System

Windows; can be ported to Mac, Linux, QNX
 HDF5 open format data storage for large datasets with many free readers

Contact Info

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