PROTEM RECEIVER

it is well known that there is a trade-off between depth of exploration and target definition in terms of conductivity, extent and orientation. Greatest depth is obtained with large fixed loop Turam-type systems which generate large half-space responses that along with current gathering, makes target detection difficult. Better spatial resolution is obtained with a moving transmitter configuration with a short inter-coil spacing but is limited to a shallower depth of exploration. These variations in survey requirements make system flexibility an important design consideration.

Time domain systems are also now routinely employed for general geological exploration such as for freshwater aquifers in bedrock fractures, and mapping groundwater contaminant plumes. Mapping to shallow depths, as necessary in these applications, requires a very wide bandwidth and many narrow sampling gates.

Recognition of these diverse requirements led Geonics to develop the extremely flexible PROTEM time domain system. The digital, 3 component receiver is used with any of the three TEM transmitters and choice of receiver coils to cover all applications. With 23 bit resolution, system bandwidth of 270 kHz, microsecond sampling gates and simultaneous XYZ component measurements, the PROTEM receiver provides the ultimate in time domain capability.

The latest addition to the PROTEM receiver enables the selection of either 20 gates per base frequency covering 2 decades of time, or 30 gates for a 3 decade range. If 3 decades of time are required to cover the decay then this selection saves switching frequencies and repeating the measurement; if only 2 decades are required, using the 20 gate range reduces the measurement time by a factor of 10. A further receiver improvement enables automatic measurements during the on-time in addition to the standard off-time measurements.

Specifications

MEASURED QUANTITY	Rate of decay of induced magnetic field along 3 axes, in nV/m^2
EM SENSOR	Air-cored coils
CHANNELS	1 channel used sequentially for 3 components or 3 channels for 3 component simultaneous operation
TIME GATES	20 gates covering 2 time decades or 30
DYNAMIC RANGE	23 bit (132 dB)
BASE FREQUENCY	0.3, 0.75, 3, 7.5, 30, 75, and 285 Hz or 0.25, 0.625, 2.5, 6.25, 25, 62.5 nd 237.5 Hz
INTEGRATION TIME	0.5, 2, 4, 8, 15, 30, 60 or 120 seconds
DISPLAY	240 X 64 dot graphic LCD
DATA HANDLING	Solid-state memory for 3300 data-sets, RS232 output.
SYNCHRONIZATION	Reference cable or, optionally, highly stable quartz crystal.
POWER SUPPLY	12 V rechargeable battery for 8 hours continuous operation.
WEIGHT	15 kg
DIMENSIONS	34 X 38 X hipping: 10 kg

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