

INNOVATUM cable and pipeline tracking systems use three different methods to acquire target data, dependant on the mode of operation:

PASSIVE MAGNETIC MODE

An array of vertically mounted magnetic gradiometers is use to collect magnetic field gradient information. The change in field gradient near to the target is caused by both the intrinsic magnetism of the target and the effect of the permeable material in the target “bending” the field of the earth. The local terrestrial field effects are mathematically removed, and the field gradients resolved to produce a two-dimensional target position. A tri-axial fluxgate sensor, which may be part of one of the gradiometer instruments, is used to provide heading information, and this combined with the known heading of the target is used to adjust the calculations for angular offsets and to produce the tracking display. Passive Magnetic Tracking is used for pipeline survey using the natural field of steel pipes, and for cable survey either by the weak natural fields of the cable, or the stronger fields developed by specially magnetising the cable armour or strength member prior to cable lay. It has excellent range performance.

ACTIVE DC MODE

This method is essentially similar to passive magnetic mode, except the field gradients are produced by the DC current flowing in the cable or pipe. Fields produced by a DC current in this manner are at right angles to the fields produced by the magnetism of a pipeline. Range is dependant on the current in the target, varying from <1m at 0.5A to >10m at 500A. May be used for tracking live HVDC cables, and trans-oceanic telecommunication cables by tracking the magnetic fields from the repeater drive currents. A “true North Seeking Gyro” is required to obtain accurate heading information.

ACTIVE AC MODE

An array of up to six tri-axial flux gates is used to sense the alternating magnetic field produced by an unidirectional AC current flowing in the target cable or pipeline. This current flow MUST have a remote return path. As the frequency of the AC may be accurately controlled, and the magnetic field signals may be accurately filtered, highly accurate data may be produced. Target direction data is also produced, allowing accurate alignment of cable maintenance vehicles with the target cable. This method of tracking is primarily used for locating, tracking and surveying cables.

Principle.pub 17/03/08