

FMCW 94GHz Distance Sensor Prototype Field Test

Penetrating Dust: our FMCW Distance Sensor Prototype Tested in the Real Field Conditions in Nickel Mine.

For years, mines have used laser distance sensors to detect the level of ore in ore passes. The accurate measurement of the ore level in an ore pass is important for many reasons. Proper ore pass level information is required to maintain the viability of the ore pass and to maximize production. In order to prevent a “hung pass” or a “sloughing pass” a method to reliably monitor the ore level is required. As well, timely and reliable ore pass level is required to plan production.

In order to resolve the problem, laser rangefinders have been used but with limited success. The principal problem associated with laser sensors is that they cannot penetrate the dust that is so common in ore passes. Another problem is that they require ongoing cleaning. Thus, a millimeter wave sensor was tried as the most likely option.

To find out if the millimeter wave sensor could really work well in their mines, Inco's Mines Technology Department (Copper Cliff, Ontario, Canada) ran a comparative experiment in collaboration with ELVA-1 and Soquelec Telecommunication, our reps in Canada. A low power 10 mW, 94 GHz (3mm wave length) sensor was chosen.



Fig.1

During the experiment, a laser sensor was tested side to side with the ELVA's FMCW Distance Sensor prototype (Fig.1). To simulate an opaque dust cloud, a bag of cement and ore dust was disseminated in a mine tunnel by compressed air and powerful fans (Fig.2). A huge underground vehicle that was 50m distant from the sensors played a target role (Fig.3).



Fig.2



Fig.3

The experiment showed that ELVA's FMCW Distance Sensor prototype easily penetrated the cement dust and that the target echo was clearly visible on the data collection PC (Fig.4). At the same time the laser sensor lost sight of the target as soon as the dust cloud reached the sensor beam.



Fig.4

For more info and additional comments on using ELVA's FMCW Distance Sensor prototype during the experiment you can contact Philip Ivanov (ivanovph@nnz.ru)

Our reps in Canada: SOQUELEC Telecommunications.

E-mail: telecom@soquelec.com

http://www.soquelec.com