

**THE VLT TIME REFERENCE SYSTEM: A MICROSECOND-
ACCURATE ABSOLUTE TIME/SYNCHRONIZATION BUS FOR
DISTRIBUTED CONTROL SYSTEMS.**

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The demanding timing and synchronization requirements of the VLT (Very Large Telescope) array of telescopes operating in interferometric mode, have led to the development of a dedicated fiber-optic bus, the Time Bus, distributing accurate timing to more than 100 Local Control Computers scattered on a wide area. The UTC (Coordinated Universal Time) is received from the Globalstar GPS (Global Positioning System) satellites, processed and distributed through the Time Bus to the Local Control Computers with accuracy in the range of few microseconds. Means for processing, backing up and relay the time information as well as for interfacing the Local Control Computers with the Time Bus, have been developed and integrated. Software drivers have also been developed providing means to synchronize processes running on different local computers to the absolute time from better than 10 microsecond accuracy at interrupt level to scheduling processes, or sending messages with millisecond accuracy. Tests have been performed to evaluate the performances both at ESO headquarters and at the VLT observatory on Cerro Paranal, Chile where the system is now in regular operation. The compliance with leap seconds, Y2K and GPS week rollover has been investigated.