UrsaNav® UN-2000 eLoran Signal Generation, Monitor and Control System

GENERAL OVERVIEW

The UrsaNav® UN-2000 is a fully redundant, UTC synchronized, eLoran signal generation, monitoring, and control system. The UN-2000 is a purpose-built foundation for resilient PNT services. Its Local Time Reference includes three ensembled Primary Frequency Reference Standards (PFS) capable of maintaining synchronization to UTC within 50ns for at least 90 days in the absence of any Remote Time Reference, such as GNSS, fiber, microwave, TWSTT, or TWLFTT. Tighter synchronization for longer durations is also available.

Easy-to-use yet sophisticated software controls the fully redundant equipment suite and provides for seamless automatic or manual handover in the event of planned or unplanned maintenance. The UN-2000 is designed for flexibility, including the ability to operate with modern SSX, NSSX, and NL series solid-state transmitters and optionally with legacy tube-type transmitters (TTX).

SYSTEM OPERATION

With built-in redundancy and seamless handover capabilities, the UN-2000 System is a key component of an eLoran service, typically installed at an eLoran transmission site. When paired with an associated eLoran transmitter, the UN-2000 provides the foundation signal generation, command, and control for very accurate and resilient nationwide and/or internationally cooperative PNT coverage.

UN-2000 Systems within a defined service area are typically networked together, thereby allowing for centralized view and operation. Each UN-2000 is capable of fully autonomous operations in the event of command, control, and/or communications failures, and can operate independently of an external time reference for extended periods.

If differential reference stations are installed as part of the eLoran service, their correction information is received and processed in one or more UN-2000 Systems. Correction data is then transmitted to user equipment over one or more LDCs.

The UN-2000 is also capable of broadcasting our patented Private eLoran Service signals with the optional encryption unit.

COMPATIBILITY	LORAN-C OR ELORAN
LORAN DATA CHANNEL (LDC)	EUROFIX, 9TH AND 10TH PULSE
UTC TIME SYNCHRONIZATION	BETTER THAN 50 NS OVER 90 DAYS
REDUNDANCY	FULL TIMING CONTROL SYSTEM
DUAL RATE SUPPORT	RATE A AND RATE B WITH BLANKING SUPPORT
BLINK SUPPORT	YES
OPTIONAL ENCRYPTION	PRIVATE ELORAN
POWER SOURCE	UPS (110V/230V)
CONNECTIVITY	ETHERNET/SERIAL
RACK SIZE (DUAL RACKS)	48 RU EACH 90IN X 23.5IN X 39.5IN 228.6CM X 59.69CM X 100.33CM

EQUIPMENT DESCRIPTION

UN - 649 Antenna Multi-Coupler / Blanker
- Measures the transmit antenna return current.

UN - 156 eLoran Monitor Receiver
- Provides measurement data of both local and remote on-air signals.

UN - 510 External Interface Unit
- Provides a series of dry contacts and temperature sensors which can be queried for status.

UN - 180 LDC Generator
- The central processor for all LDC-related functions, such as message scheduling, formatting, encoding and modulation.

LCD Panels and Keyboards

UN - 570 Integrated Monitor and Control Set
- Provides monitoring and control of all transmitter sub-systems.

### UN - 450 eLoran Timing Generator
- Drives signals and any Loran Data Channel (LDC) modulation, such as Eurofix or 9th/10th pulse.
- Receives a stable frequency and UTC from the UN-460 and data from the UN-180 LDC Generator.

UN - 460 UTC Master Timing Reference
- Provides an eLoran local timescale. The timescale is based on the ensemble frequency of the Primary Frequency Reference Standards (PFS) synchronized to UTC.

UN - 515 Communication Interface
- Connects to three Primary Frequency Reference Standards (PFS) and is able to send commands or query their status.
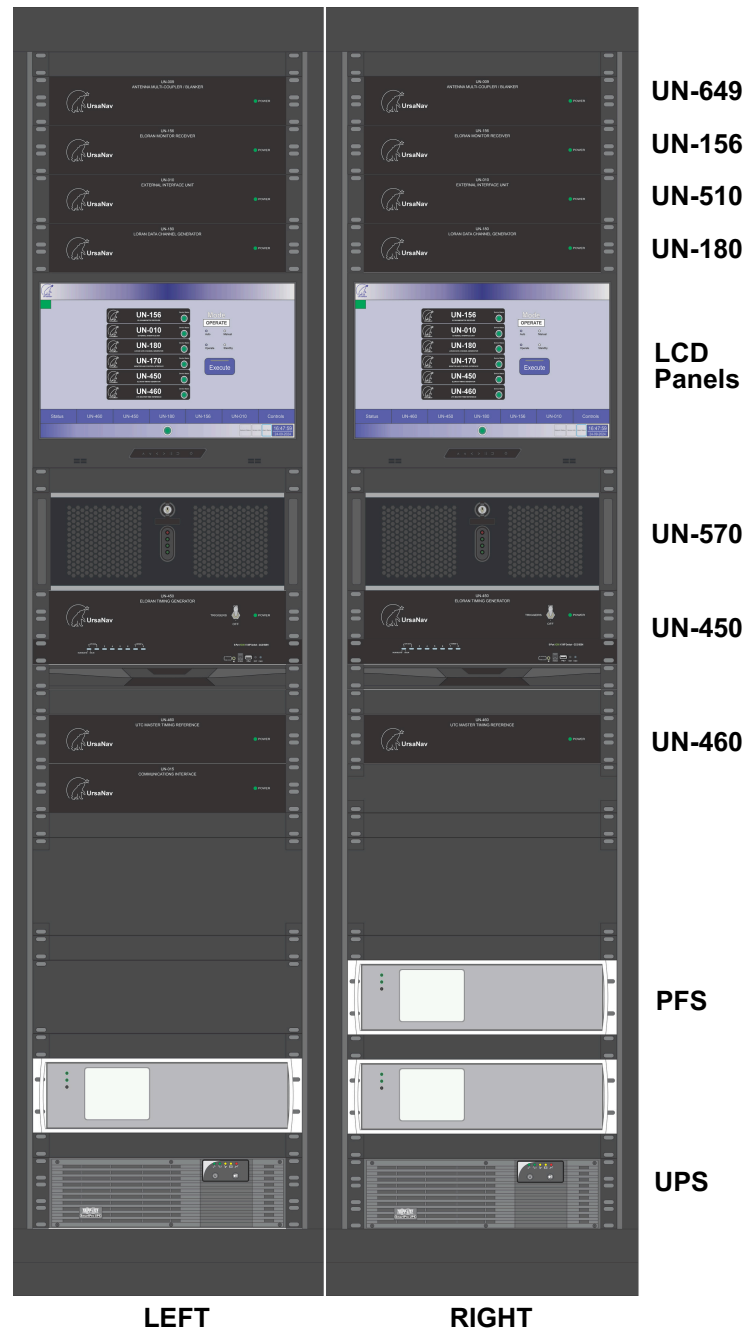
UN-649
UN-156
UN-510
UN-180

LCD Panels

UN-570

UN-450

UN-460

PFS

UPS

LEFT **RIGHT**

The heart of each of the redundant sides of the UN-2000 System is the UN-460 UTC Master Timing Reference.

The UN-460 provides UTC-synchronized reference frequencies at 5 and 10MHz as well as UTC TOD messages to other equipment in the UN-2000. The UN-460 uses inputs from the Local and Remote Time References to discipline its own highly stable Rubidium oscillator. The Local Time Reference is "air-gapped" from the Remote Time References to ensure external time sources do not compromise timing independence.