

TOSHIBA

NAVAIDS SYSTEM

ILS CAT-I

Instrument Landing System Category-I

- Toshiba's ILS is designed based on the advanced technology.
- Toshiba's ILS has more than a 60-year-history with a huge supply record of installations in domestic and worldwide airports.
- Toshiba's ILS is continuing to contribute to the improvement in air traffic safety throughout the world.

Key Product Features

- ◆ Digital Generated High Stability Signal
- ◆ Unman Operation and Easy Maintenance
- ◆ High Quality and High Reliability
- ◆ Dual Configuration
(Transmitter, Transponder, Monitor)
- ◆ Applicable International Standard



ILS CAT-I

CHARACTERISTICS

1 Localizer (LOC)

| | |
|--|---|
| Coverage | Course 25 NM ($\pm 10^\circ$) / Clearance 17 NM (+10 to +35°, -10 to -35°) |
| Frequency range | 108 to 111.975 MHz (Two frequency system) |
| Frequency tolerance | ± 0.001 % |
| Spurious emission | Less than 50 μ W |
| Output power | Up to 25 W (Adjustable) |
| Output Impedance | 50 ohm (Typical) |
| Modulation frequency | 90Hz / 150 Hz |
| Modulation frequency tolerance | ± 1 % |
| Modulation depth | 15 to 25 %, adjustable |
| Identify keying modulation frequency | 1020 ± 3 Hz |
| Monitor items | DDM, RF level, Modulation depth, ID and Frequency Difference (Dual configuration Monitors with Hot Stand - by Monitoring) |
| Alarm period to automatic changeover or shutdown | 0.5 to 15 seconds, adjustable |
| Number of antenna elements | 24 elements (LPDA) |
| BITE items | Equipment status data, Equipment measurement data |

2 Glide Path (GP)

| | |
|--|---|
| Coverage | 10 NM ($\pm 8^\circ$) |
| Frequency range | 328.6 to 335.4 MHz (Two frequency system) |
| Frequency tolerance | ± 0.001 % |
| Spurious emission | Less than 50 μ W |
| Output power | Up to 10 W (Adjustable) |
| Output Impedance | 50 ohm (Typical) |
| Modulation frequency | 90 Hz / 150 Hz |
| Modulation frequency tolerance | ± 1 % |
| Modulation depth | 35 to 45 %, adjustable |
| Monitor items | DDM, RF level, Modulation depth and Frequency Difference (Dual configuration Monitors with Hot Stand - by Monitoring) |
| Alarm period to automatic changeover or shutdown | 1 to 15 seconds, adjustable |
| Number of antenna elements | 3 elements (Capture Effect M-Array) |
| BITE items | Equipment status data, Equipment measurement data |

ENVIRONMENTAL CONDITIONS

| | |
|---------------------------|--|
| Temperature (Except COTS) | -10 to +55 °C (indoor), -40 to +60 °C (outdoor) |
| Humidity | Maximum 95 %RH |
| Wind speed | Maximum 60 m per second (survival, standard) Maximum 90 m per second (survival, option) |
| Input power | +40 to +56 VDC (Nominal +48 VDC) |

APPLICABLE STANDARDS

ICAO Annex 10, Annex 14
ISO 9001
RE DIRECTIVE 2014/53/EU

3 Terminal DME (T-DME)

| | | |
|----------------------|--|-----------------------|
| Coverage | As per LLZ coverage | |
| Transponder capacity | 200 interrogators | |
| Frequency range | 960 to 1215 MHz | |
| Frequency Stability | ± 0.001 % | |
| Output power | 100 W peak or more | |
| Spurious emission | More than 60 dBc | |
| ON/OFF Isolation | More than 80 dB | |
| Transmitting rate | 700 to 5400pps ± 90 pps | |
| Pulse Shape | duration | 3.5 ± 0.5 μ s |
| | rise time | 1.5 to 3.0 μ s |
| | decay time | 1.5 to 3.5 μ s |
| Pair pulse spacing | 12 ± 0.25 μ s (X mode), 30 ± 0.25 μ s (Y mode) | |
| Reply delay | 50 ± 0.5 μ s (X mode), 56 ± 0.5 μ s (Y mode) | |
| Sensitivity | Less than -91 dBm | |
| T-DME antenna type | Omni-directional | |
| BITE items | Equipment status data, Equipment measurement data | |

4 Far Field Monitor System (FFMS)

- FFMS Monitor LOC radiated signal in its operational environment at critical point in the final approach
- Far Field Monitor receiver: installed in LOC Shelter
- Far Field Monitor antennas: installed at appropriate place for course line monitoring (course sector monitoring)

5 Remote Control and Monitoring System

Remote operation control and equipment status monitoring of LOC, GP and T-DME

Remote Maintenance & Monitoring System (RCMS)

- The RCMS is capable of monitoring and displayed the operating status of each ILS interfaced.
- Control and Monitoring: ON/OFF of equipment, Switching of dual configuration equipment, Monitoring of equipment status
- Windows OS based PC Application (Interface RS232C or Ethernet)

Remote Control & Status Unit (RC Unit)

- RC Unit performs monitoring and control of the ILS via landline and wireless link between each site and the monitor room.
- Monitoring functions: Transmitter ON/OFF status, Total monitor alarm status, AC commercial power failure, Battery voltage alarm, Remote Control line alarm, Buzzer stop status, Power ON/OFF status, Others
- Control functions: Transmitter ON/OFF, Buzzer stop, Power ON/OFF, Others

LOC Interlock System

- LOC interlock unit: visual indication of the LOC operating status
- Functions: Manual Transfer Switch, Operational Direction Indication

ILS Status & Category Status Unit

- ILS status and Category Status unit: visual indication of the operating status of the ILS equipment and category.
- Functions: Operation / failure indication, Alarm for failure and shut down, Alarm silence control, Category status

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