**Characteristics**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
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</thead>
<tbody>
<tr>
<td><strong>Monitor</strong></td>
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<tr>
<td>Number of monitors</td>
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<tr>
<td>Alarms (Configurable between primary and secondary)</td>
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<tr>
<td>Reply delay</td>
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</tr>
<tr>
<td>Pulse pair spacing</td>
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</tr>
<tr>
<td>Reply efficiency</td>
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<tr>
<td>Reply rate</td>
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<tr>
<td>Radiated power</td>
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<tr>
<td>Transmitted power</td>
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<tr>
<td>Receiver frequency</td>
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<tr>
<td>Transmitter frequency</td>
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<tr>
<td>Ident</td>
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<tr>
<td>Sensitivity</td>
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<tr>
<td>Local and remote shown parameters</td>
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<tr>
<td>All monitored parameters</td>
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<tr>
<td>Detailed status info</td>
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<tr>
<td><strong>General</strong></td>
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<td>Status indication</td>
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<tr>
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</tr>
<tr>
<td>MTBO</td>
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</tr>
<tr>
<td>MTTR</td>
<td>15 min. (typical)</td>
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*Indra reserves the right to modify these specifications without prior notice.*
DME

DISTANCE MEASURING EQUIPMENT

Introduction

The Indra DME is the result of extensive Indra’s expertise in radio navigation aids that enables efficient operation and reliability in extreme conditions. It is a stand-alone system developed with state-of-the-art technology achieving high reliability. Its modular design is in conjunction with its powerful DME system allows fast failure location and minimum repair time. The main intrinsic advanced characteristics of the Indra DME is its high reliability.

Main characteristics

- Absolute design
- Sublative components
- Multiple interrogators (F2, F2C, F2M)
- FPGA logic and embedded DME
- Friendly and intuitive user interface
- Easy and fast installation
- Multiple configurations
- Standard and flexible RPM architecture
- High level BITE

Quick in use

The BITE (Built In Test) system reduces the requirement for routine maintenance to an absolute minimum. The BITE system fast location facility, enables drastically reduced repair times to be achieved.

In order to achieve this aim critical parameters of the system are constantly checked along the available bandwidth towards the degradation of the systems characteristics and minimizing the maintenance tasks. The results of the BITE process are available both remotely, at the Remote Monitoring (RMM), and locally.

Maintenance and reliability

RMM

The Indra DME is an easy to use system equipment internal maintenance that ensures maximum all requirements of ICAO Annex 10, ICAO F2C, FAA E-2996, ENR, and BITE. This enables interoperability with all currently available radio navigation aids on the market.

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Introduction

The Indra DME is the result of extensive Indra’s expertise in radio navigation aids that enables efficient operation and reliability in extreme conditions. It is a stand-alone system developed with state-of-the-art technology achieving high reliability. Its modular design is in conjunction with its powerful DME system allows fast failure location and minimum repair time. The main intrinsic advanced characteristics of the Indra DME is its high reliability.

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DME DISTANCE MEASURING EQUIPMENT

Introduction

The Indra DME is the ultimate choice in Distance Measuring Equipment combining efficient operation and simple installation.

The Indra DME is an easy to use system equipment. Its reliability and maintainability are fundamental to the design concept of this system.

Maintenance and reliability

Indra DME is a high performance system that meets or exceeds all requirements of ICAO annex 95%

Indra DME is designed to be easy to install, commission and maintain in order to meet the demands of both civil and military users.

Main characteristics

- Absolute design
- Sublimate components
- Multiple interfaces (Ethernet, PS2, RS422, RS232)
- FPGA logic and embedded RTE
- FRIENDS and intuitive user interface
- Easy and fast installation
- Multiple configurations
- Standard and flexible. BITE architecture
- High level BITE

Quick to test

The BITE (Built In Test) system reduces the requirement for in-line maintenance to an absolute minimum. The BITE system fast location facility enables dramatically reduced repair times to be achieved.

Indra DME

This Indra DME is the result of extensive Indra’s expertise in radio navigation with that translates into high-performance and high reliability equipment. The Indra DME system allows fault location and minimum repair times. The main and most advanced characteristics of the Indra DME is its high reliability.

Characteristics

TRANSMITTER VARIATIONS

- Power output: 50W to 1Kw
- Frequency: 1089 to 1150 MHz
- Frequency stability: ± 1 ppm
- Channels: 216 (X & Y)
- FAA-E-2996 (155MHz to 1 GHz)

ENVIRONMENTAL

- Indoor: -40ºC to +85ºC
- Outdoor equipment: -50ºC to +70ºC
- Indoor equipment: -20ºC to +60ºC
- Temperature: -40% to +80%
- Humidity: 50% (> 50ºC)

TRANSMITTER CHARACTERISTICS

- Receiver frequency: 960 MHz to 1210 MHz
- Spurious rejection: ≥ 80 dB
- Image frequency rejection: ≥ 80 dB
- Adjacent channel rejection: -95 dBm
- S/N ratio: (70% reply efficiency)
- Sensitivity: 300 Interrog.
- Pulse duration: 3.5 μs
- Fall time: 2.5 μs
- Rise time: 2.5 μs
- Reply delay: ±10 μs
- Pulse repetition rate: 700 to 6000 pp/s
- Identity rate: 1350 Identity signal
- Identity signal: ICAO Annex 10, ± 15 pulses
- Pulse pair spacing: ± 5 μs nominal
- Pulse RF spectrum (analysis of 500KHz): X: 35 a 80 kHz
- Y: 45 a 80 kHz
- Channels: 252 (X & Y)
- Frequency stability: ± 1 ppm
- Frequency: 960 MHz to 1215 MHz
- Output power: 100 W or 1 KW
- Output stability: 0.5 μs nominal
- Terminal: 9600 bits/s

Hardware

- Memory: 500 MBytes
- LED display: 50, 100, 200, 300, 500
- Hard drive: 3.5” 5400 rpm
- BITE (Built In Test): 0.5 %
- Software: 0.05 MHz
- Dimensions: 19" x 45° x 80°
- Weight: 13 kg
- Software architecture: ICAO Annex 10, ± 15 pulses
- Interfaces: Ethernet, RS232, RS485
- Software: 0.05 MHz
- Dimensions: 19" x 45° x 80°
- Weight: 13 kg
- Software architecture: ICAO Annex 10, ± 15 pulses
- Interfaces: Ethernet, RS232, RS485
- Software: 0.05 MHz

Maintenance

- High availability
- Low cost
- Easy installation
- Friendly interface
- Stand alone
- Remote and local
- Simple and comprehensive
- Integrated test system
- Low MTBF and MTTR
- High MTBF and MTTR
- Easy and fast installation
- Multiple configurations
- Standard and flexible BITE architecture
- High level BITE

The result of Indra’s expertise in radio navigation is a new distance measuring equipment highly reliable and low cost.
**Introduction**

Indra DME

This Indra DME is the result of extensive Indra’s expertise in radio navigation that ensures efficient operations and meets the requirements of the modern air navigation user friendly interface. It is a solid state system developed with state of the art technology achieving high reliability. Its modular design in conjunction with its powerful BIT system allows fast failure location and immediate repair time. The main intrinsic advanced characteristics of the Indra DME is its high reliability.

**Quick to test**

The BIT (Built In Test) system reduces the requirement for time consuming maintenance to an absolute minimum. The BIT system fast location facility, enables drastically reduced repair times to be achieved.

In order to achieve these ambitious parameters of the system are constantly checked, along the possible degradation of the characteristics of the system, the BIT system is constantly monitoring the main system parameters. The results of the BIT process are available both remotely, at the terminal and locally.

**Main characteristics**

- Absolute design
- Sublative components
- Multiple interfaces (Ethernet, POSUI, RS485, RS642)
- FPGA logic and embedded EPC
- Friendly and intuitive user interface
- Easy and fast installation
- Multiple configurations
- Standard and flexible BMP architecture
- High level BITE

**Maintenance and reliability**

RMM

Indra DME enjoys high reliability that is, where referred to the high TPPT and low TPPT, resulting in reduced maintenance requirements. Thanks to its integrative approach is possible to perform efficient and fast maintenance procedures.

The Indra DME equipment can be integrated with a variable and robust software architecture that allows comfort and simple installation, configuring, with several security levels, the software architecture to base on standard protocols which provide intuitive and simple operation.

**Characteristics**

- **TRANSMITTER RADIO SPECIFICATIONS**
  - Output power: 500 W or 1 KW
  - Frequency: 960 MHz to 1215 MHz
  - Frequency stability: ± 1 ppm
  - Channel: 30 V (30 V RMS)
  - Power interferences rejection (EIRP) ≤ 30 dBm
  - Spurious rejection: ≤ 30 dBm
  - Terminal: ≤ 50 dB (30 V RMS)
  - Frequency: 19.2 KHz ± 300 Interrog. & 300 Interrog. ≤ 50 W or 1KW
  - Identity rate: 50 % ± 5 %
  - Pulse duration: 0.5 μs ± 0.25 μs
  - Rise time: ≤ 0.5 μs
  - Fall time: ≤ 0.5 μs
  - Identity signal: 1 μs ± 0.2 μs
  - Spurious rejection: ≤ 40 dBm/KHz
  - Harmonics: < -40 dBm/KHz (0 Hz to 1.8 GHz)
  - Spurious: < -10 dBm (EIRP)
  - Terminals: ≤ 47 dB @ 0.8 MHz
  - En-route: ≤ 55 dB @ 2 MHz
  - Indoor equipment: -20ºC to +60ºC
  - Outdoor equipment: -50ºC to +70ºC

- **RECEIVER CHARACTERISTICS**
  - Receiver rejects: ≤ 95 dBm (70% reply efficiency)
  - Receiver reject: ≥ 75 dB
  - Receiver reject: ≥ 80 dB
  - Intermediate frequency rejection: 85 dB
  - Signal frequency: 3.50 a 8.00 MHz
  - Frequency stability: ± 500 kHz ± 10 Hz
  - Channel: ≤ 50 Hz
  - Frequency: 700 a 6000 pp/s
  - Identity rate: ≤ 50 kHz
  - Step: 0.05
  - Y: 45 a 80
  - Pulse RF spectrum: ≤ -81 to -95 dBm
  - Channels: 252 (X & Y)
  - Frequency: 37 dB @ 0.8 MHz
  - Harmonic rejection: < 37 dB @ 0.8 MHz

- **ENVIRONMENTAL**
  - Humidity: 90% (35ºC to 50ºC)
  - 60% (> 50ºC)
  - 90% (35ºC)
  - Temperature: 55ºC @ 2 MHz
  - Output power: 100 W or 1 KW
  - Frequency stability: ± 1 ppm
  - Frequency: 960 MHz to 1215 MHz
  - Frequency: 300 Interrog. ≤ 50 W or 1KW
  - Aircraft handling capacity: 300 Interrog.
  - Receiver rejects: ≤ 300 Interrog.
  -復数: 300 Interrog.
  - Frequency: 100 kHz ± 10 kHz
  - Frequency: 1 ppm
  - Frequency: 1 MHz
  - Frequency: ≥ 0.5 MHz
  - Frequency: ≥ 0.5 MHz
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  - Frequency: ≥ 0.5 MHz
  - Frequency: ≥ 0.5 MHz

- **RELIABILITY**
  - Mean Time Between Failure (MTBF): 100,000 hours
  - Mean Time To Repair (MTTR): 10 minutes

- **TECHNICAL SPECIFICATIONS**
  - Temperature: -50ºC to +70ºC
  - Humidity: 95% (between 0ºC and 70ºC)
  - Humidity: 60% (between 0ºC and 70ºC)
  - Humidity: 60% (between 0ºC and 70ºC)
  - Humidity: 60% (between 0ºC and 70ºC)
  - Humidity: 60% (between 0ºC and 70ºC)

- **REGULATIONS**
  - FAA-E-2996
## Characteristics

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Monitor</strong></td>
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<tr>
<td>Number of monitors</td>
<td>4</td>
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<td><strong>General</strong></td>
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<td>Status indication</td>
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<td>BIT</td>
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<tr>
<td><strong>Reliability</strong></td>
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<tr>
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</tr>
<tr>
<td>MTBR</td>
<td>≥ 18,000 h</td>
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<tr>
<td>MTTR (typical)</td>
<td>15 min.</td>
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</tbody>
</table>

**Note:** Detailed specifications in the Indra company.com.
### Characteristics

**Units of measurement**
- Pulse delay
- Pulse pair spacing
- Power efficiency
- Radiated power
- Transmitted power
- Receiver frequency
- Transmitter frequency
- Ident
- Sensitivity

**Local and remote shown parameters**
- All monitored parameters
- Detailed status info tender

**GENERAL**
- Status indication
- Local/remote
- BITE (Built-In Test Equipment)
- Remote/local control
- Interface
  - Ethernet
  - RS-232
  - RS485

**Reliability**
- MTBF: \( \geq 10,000\) h
- MTBF: \( \geq 18,000\) h
- MTTR: 15 min. (typical)

---

**Distance Measuring Equipment**

Supplying ATM systems around the world for more than 30 years

indrascopany.com