

Case Study

Terminal 3 [Etihad Airways], Abu Dhabi Airport

The Challenge



The new Terminal 3 building at Abu Dhabi International Airport required a dual-redundant master clock system using GPS as the time source. Terminal 3 is dedicated to Etihad Airways, the national airline of the UAE.

The system was to provide accurate and synchronised time to a variety of other systems in the airport (e.g. passenger information displays, baggage handling, CCTV etc) plus provide time displays in public and non-public areas of the airport terminal.

The output interfaces required included serial, timecode and Network Time Protocol (NTP).

The Solution

Time & Frequency Solutions designed a system to exactly meet the requirements of the specification.

Two of our highly precise M211 Modular Timing Systems in Dual Redundant configuration with a M842 Changeover Unit provided the basis of the system.

Additional power backup was provided with our M811 Battery Unit, capable of providing enough power to keep the whole system operating if the mains supply is interrupted.

A GPS Long Distance Antenna System (comprising head-end antenna and decoder) provided each M211 with GPS time information. This configuration overcomes any signal loss experienced when routing the GPS L1 carrier over long cable lengths.

Integral oscillators are disciplined by this information, so that in the event of loss of GPS signal, the oscillators keep the clock system functioning at normal levels of accuracy for many hours whilst in 'holdover mode'. The signal is then converted to the various formats required by the addition of modules inside the chassis of the M211.



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Dual Redundant M211 Modular Time & Frequency System

Configuration for Terminal 3, Abu Dhabi Airport

In addition to the main Dual Redundant M211 Time & Frequency System, the following modules were installed into each chassis:

- **BITE (Built-In Test Equipment)** - In the event of a fault developing in the main M211 system, the BITE module sends an alarm to the Changeover unit, which then activates the backup M211 to take over.
- **NTP 100baseT** - Distributes time information across an Ethernet network using Network Time Protocol (NTP). Client systems and Sub-Timing Systems can then be synchronised to the timeserver by accessing it across the network. Inclusion of this module also provides the capability of remote monitoring of the entire system using SNMP –see NMS below.
- **Octal Serial module** – Provides eight fully independent serial channels (7 output; 1 input). Outputs are all routed via switching relays to the M842 Changeover & Interface unit.

Time Displays

In addition, we provided twelve **M385 Analogue Clocks** for the public areas of the terminal, and **twelve M355 LED Time Displays** for the non-public areas.



Network Management System (NMS)

We also provided an NMS, which is a windows-based application enabling remote monitoring and control of the timing system and component parts by SNMP running over an Ethernet network.

Its user-friendly graphical interface with a visual representation of the TDS components allows for monitoring of status including alarms, software and hardware faults, errors and serial number details.

A separate Visual Software Interface (VIS) application is included which provides a visual representation of the Master and Sub-Master Clock's LCD panels. This application provides the user with the ability to remotely configure and control the units.

