

# Case Study

## National Air Traffic Services [NATS]

### The Challenge



NATS provides en route air traffic control services to aircraft flying in UK airspace, and over the eastern part of the North Atlantic. It also provides services at fifteen of the UK's largest airports, including Heathrow, Gatwick and Stansted.

NATS required a new Commercial-Off-The-Shelf (COTS) time distribution system at the Swanwick centre, Hampshire to replace the existing system in operation at the London Terminal Control Centre, West Drayton. To maintain stringent safety procedures the system needed a high level of built-in resilience.

A second system was required at NATS' Corporate and Technical Centre in Whiteley, Hampshire to be used in its training and simulation facility. It didn't need the same high level of redundancy as the Swanwick system but utilise the same principles and network management facilities to ensure ease of maintenance.

The final requirement was for a control and monitoring system, including test and diagnostics.

### The Solution

The M211 Modular Time & Frequency System is a flexible, high-capacity system with 9 separate module slots - this made it ideal for the NATS requirement, where synchronisation of many different output interfaces was required, e.g to CCTV, voice recorders, telephone network, etc.

Two separate M211s were installed at Swanwick, one in each of the two equipment rooms. The units are configured to provide a dual redundant highly resilient timing source. Each M211 was equipped with an integral Global Positioning System (GPS) receiver with a feed from separate roof mounted antennas.

Each M211 also had integral MSF receivers to ensure a time synchronisation source was available in the event that GPS signal was interrupted. A high stability internal oscillator provides an extremely accurate free running capability in the event of both synchronisation sources being unavailable.

Because of the high capacity of the M211s, sufficient space was available within the chassis to fit IRIG-

B and Timeon time code modules to interface with legacy systems. Serial modules and an Ethernet module were included in the M211 units to interface with companion systems.

Each M211 had outputs to 3 serial distribution units, which distribute the time to 20 displays. The standard ATC console display was redesigned to fit with the London Terminal Control Centre desks.

The M211s feed a racked M210 Modular Timing System. These act as sub master clocks in the equipment rooms and distribute the time signal to other systems. Each sub master clock has been dedicated to a third party system to improve resilience.

Further redundancy is provided by cross-connections between the M211 masters and the sub-masters. In the highly unlikely event of a failure in a signal from one of the master clocks, the sub-masters will continue with no interruption to service.

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# Dual Redundant M211 Modular Time & Frequency System

## Configuration for NATS

### M211 Modular Time & Frequency System

- Ideal where synchronisation of many different output interfaces is required
- 9-slot module output capacity
- Choice of clock synchronisation options
- Choice of master clock accuracy
- Large range of output options
- 3 U high standard 19" rack mount
- 5 button front panel keyboard for equipment configuration and control
- Alphanumeric display of time, date and status
- Equipment configuration stored in non-volatile memory
- Synchronised to an external time and frequency source
- High accuracy internal oscillator options available
- Remotely controllable

### Network Management System

- Centralised or remote monitoring and control of TFS Timing System and component parts
- User-friendly graphical interface allows monitoring in overview or detail mode
- Visual representation of instrument front
- Fault log reporting on errors occurring in the Timing System
- Monitoring Status e.g. Alarms, Software and Hardware Faults Errors, Serial number details
- Flexible options: different platforms, customisation or delivered on a pre-configured PC.
- SMS text alerts when alarms are triggered



*M211 High Capacity Modular Time & Frequency System*