Overview

5000 series network time servers provide a complete time synchronisation solution for both standard network applications and also more complex networked systems and installations.

These time servers have many different standard and optional configurable signal interfaces to ensure compatibility with an extensive range of current and legacy equipment in applications requiring accurate time synchronisation.

Typical applications include air traffic control systems, broadcasting, CCTV security systems, computer and communications networks. industrial process control, voice and data recording, surveillance and many types of mechanical and electronic digital and analogue secondary slave clocks.

The 5000 series network time server has London Underground and Network Rail Infrastructure approval (PA05/03968)

Model Range

Model	Case type	10/100Base-t network interfaces	zCode digital code or pulse output	Option module positions
5200	1U high 19" rack	One	Two	Four
5201	1U high 19" rack	One	One	Four
5400	2U high 19" rack"	One	Two	Seven
5600	2U high 19" rack"	Two	Two	Seven

Operational Features

Input time synchronisation

These GPS Network Time Servers are available as standard with GPS, MSF, DCF, NTP and serial ASCII input synchronisation options. An optional module enables redundant dual synchronisation. Further options enable EBU, IRIG-B and optically connected signal synchronisation.

Ethernet

All models have a 10/100Base-t Ethernet interface to allow the unit to act as an NTP Time Server on a TCP/IP network. 5600 network time servers are fitted with dual 10/100Base-t Ethernet interfaces to provide additional system redundancy and expansion capability.

Multiple standard output signals

An RS232/RS485 serial port enables input or output GPS time synchronisation using any of an extensive range of serial ASCII message strings.

Every model has either one or two zCode® output ports for the control of digital and analogue clock systems and similar equipment. Individual zCode® outputs can be user programmed to transmit w482 time code, active MSF, active DCF or 24V alternate polarity impulses at one second, half minute or one minute intervals.

Multiple standard output signals……….. Continued

An optional AFOUT output interface will add two outputs which can be user programmed to generate either 1Khz amplitude modulated IRIG-B time code for the synchronisation of various voice recording, data logging and distributed control system equipment, or EBU (LTC) time code for use in broadcast applications. Additional optional output modules have programmable 110V DC or 230V AC switching relay contacts, fibre optic communication and logic level outputs.

Power supply

Standard units have an internal power supply for 110-230V AC mains operation. 24V or 48V DC operation is available as an option. Dual redundant 110V-230V 50/60 Hz mains AC option available on 5400 and 5600 product versions.

Standard input synchronisation modes

5000 series network time servers have standard input ports to receive time synchronisation signals from other equipment in various formats.

Wharton digital time code

Standard input synchronisation interface. Allows synchronisation from external 488HS3 -GPS, HS3-GLONASS or 484 series MSF / DCF radio receiver.

NTP/SNTP

NTP/SNTP synchronisation from remote NTP time server located on TCP/IP network.

RS232

RS232 Serial input, allowing time synchronisation from various standard serial time codes.

Optional input synchronisation modules

Three optional modules are available to extend the range of time reference signals with which a 5000 series master clock may be synchronized.

SYNC2

Second synchronisation interface to give dual redundant functionality. Allows synchronisation from second external 488HS2 or 488HSX2 GPS receiver or 484 series MSF / DCF radio receiver.

AFIN

Allows unit to synchronise to an externally generated 25fps EBU LTC time code or 1KHz Amplitude Modulated IRIG-B signal.

OPTIN

Optical input, allows unit to synchronise to various optically connected time codes. ST Fibre Optic connectors - 62.5/125um (820nm).

Standard Output Protocols & Interfaces

520x and 5400 network time servers are equipped with a 10/100Base-t Ethernet interface which allows them to act as a time server on a TCP/IP network. The 5600 model is equipped with dual 10/100Base-t Ethernet interfaces.

In addition to its use as an Ethernet time server each 5000 series unit also function as a master clock or time central to control and synchronise intelligent digital and analogue clock systems and other intelligent equipment with output ports providing a variety of user configurable synchronising signal formats.

Ethernet Output Protocols

NTP

Network Time Protocol (NTP) v2, v3 and v4 clients are supported in both unicast and broadcast modes of operation. (RFC1305 & RFC1119).

SNTP

Simple Network Time Protocol (SNTP) v3 and v4 clients are supported in both unicast and broadcast modes of operation. (RFC2030 & RFC1769).

TIME

TIME protocol (RFC868) is supported in UDP and TCP mode.

DAYTIME

DAYTIME protocol (RFC867) is support in UDP and TCP mode.

Other Standard Output Interfaces

zCode

One or two synchronisation outputs for controlling digital and analogue clocks. Each output is programmable for w482, Active MSF, Active DCF coded signals and 24V Alternate Polarity Impulses.
Each output supports up to 100 off 4000E or 4000NE series digital clocks and time zone displays in w482 time code mode.
In 24V alternate polarity impulse mode, each output is programmable for one second, half minute or one minute impulses. Each output is rated for a 500mA load. (5xx0 units have 2 zCode outputs, 5xx1 units have 1 zCode output.

RS232/RS485

Serial interface. 1200-57600 Baud, 7/8 data bits, odd/even/no parity. User selectable output from over 80 predefined data formats for specific CCTV and embedded equipment. The optional SER23 dual output port module provides two additional independently configurable or buffered RS232/RS485 serial ports.

1 PPS

High accuracy 1 pulse per second output of 100mS duration at RS232 levels. The leading edge of the signal is within 50uS of UTC when locked to GPS.

Optional Output Interfaces

A range of optional modules is available at extra cost to generate alternative or additional output synchronising signals.

AFOUT

Dual audio time code outputs. Each output user selectable for 25fps EBU LTC time code or 1KHz Amplitude modulated IRIG-B time code.

OPTOUT

Dual Fibre Optic output. Can be configured to output demodulated IRIG-B, EBU or Serial ASCII data. ST Fibre Optic connectors - 62.5/125um (820nm).

SER23

Dual RS232/RS485 serial output option. 1200-57600 Baud, 7/8 data bits, odd/even/no parity. User selectable output from over 80 predefined serial messages.
The 5000 series network time server can have a maximum of 3 independently configured serial ports using the standard port plus one SER23 dual option module, however, multiple SER23 modules may be fitted to the same unit to provide additional buffered outputs for ports 2 and 3. Dual DB9 connection.
Each dual port SER23 option module uses two adjacent option module positions when fitted.

Optional Output Interfaces……..Continued

RELAY

Dual 230V AC mains rated relay contact pairs for periodic synchronised closure, signalling of error conditions and precision timed control of third party equipment.

LVRELAY

Dual 110V DC rated relay contact pairs for periodic synchronised closure, signalling of error conditions and precision timed control of third party equipment.

DEMOUT

Demodulated time code output. 4 mirrored logic level outputs. Each module can be user configured to output demodulated IRIG-B, MSF or DCF time codes, a pulse per second or other user selectable periodic signals.

Serial Data Formats

Each of the three available RS232+RS485 serial interface ports (ports 2 and 3 require the SER23 option module) can be configured for many different pre-programmed data message formats for specific CCTV, security and embedded equipment time synchronisation.

Non-specific message formats are user selectable for transmission every second, every minute, every five minutes, every hour, every day or on request.

The data rate and format of non-specific messages may be set for 1200, 2400, 4800, 9600 or 19200 baud, 7 or 8 data bits and even, odd or no parity.

The following standard serial message formats are pre-programmed in addition to four specific Wharton formats. Where referenced please refer to the appropriate application note. If the data rate, format and repetition rate are pre-defined by the application these parameters are pre-set.

Adder Digital Technology
ADT Site Guard - application note AN132
AIT Comfile
Ascom NIS2000
ASC Telecom DL2 - application note AN129
ASC Telecom Marathon - application note AN136

ATIS MDS2000
AudioSoft
Baxall DTL 960 - application note AN141
BAXNET / Vista - application note AN139
Cartner
Coe - application note AN120

Dedicated Micros Digital Sprite, Sprite2, BX2- application note AN127
Dedicated Micros Uniplex Series I/II
Geutebruck MultiScope
Geutebruck TDT-10 / VicroSoft / AMC
GPZDA NMEA Message
Grosvenor Technology Janus - application note AN132

Grundig / Plettac Vaz300
Harmony - application note AN132
Loronix / Verint - application note AN132
LUL (Standard / Northern Line formats)
Macq Electronic SA
Maxpro

Serial Data Formats……….Continued
Meyertech Zoneview - application note AN123
Mitsubishi HS-S5600 - application note AN112
Mitsubishi HS-S8300 - application note AN133
Moser-Baer IF482
NATS Link Protocol
Neal - application note AN124

NetClock2 - application note AN128
Norbain Vista Columbus
Panasonic AG6040 / 6730 / 6740 / 6760 - application note AN113
Panasonic WJHD500
Panasonic WJSX850
Petards Cobyt

Philips/Bosch Allegiant LTC8300, 8511C, 8610/00,8719A, 8810/00, 8910/00 series
Philips/Bosch Burle TC8286 & TC8288
Philips/Bosch Divar - application note AN140
Philips/Bosch DVR1
Philips/Bosch LTC2600
Philips/Bosch LTC3990/50

Racal CD20
Racal Wordsafe
Schauer
Scientific Atlanta / CSI - application note AN111
Serial reference clock for standard NTP distribution - application note AN128
Sony HSR1 / 1P / 2 / 2P - application note AN135

Syac DigiEye
Racal ICR64 & EBCDIC ICR64
Racal Wordnet
Synectics - application note AN126
Tardis
Team Simoco
Tecton Darlex - application note AN137

Tecton Drax - application note AN101
Tecton Kramplex - application note AN125
Tecton Rugby Clock Interface
Tower Access Control
Ultrak Maxpro - Max1000
Vicon Kollector DVR range

Vicon ViconNet System
Vicon VPS - application note AN100
Vision Factory Cameo - application note AN117
Vision Factory Cameo D1 - application note AN138
Vision Factory Montage - application note AN115
Vision Factory Montage+ - application note AN116
Vision Research Company - Krammer 4 - application note AN102

Environment and Accuracy

Operating temperature:	0-50° C
Relative Humidity:	0% to 90% (non-condensing)
Altitude:	0 to 3,000m
MTBF:	>100,000 hours
Power supply:	Internal PSU 110-240V ac. 50/60Hz.
	DUALAC dual redundant 110-240V 50/60Hz mains
	AC power supply option.
	24V dc and 48V dc options are available on request.
Power consumption	< 100VA

Internal battery backup maintains the internal time count for > 1 year during period of mains failure.

5000 series network time servers have a standard high quality integrated TCXO to provide an unsynchronised accuracy of <0.1 sec/day @ 0-45°C

An optional TCXOHQ may be specified to provide an unsynchronized accuracy of <0.01 sec/day @ 0-45°C

Locked to MSF or DCF the system accuracy is typically within 30mS of UTC when the clock is synchronised via a Wharton 482.02 MSF or 482-03 DCF77 receiver

Locked to GPS or GLONASS the system accuracy is typically within 5mS of UTC when the clock is synchronised via a Wharton 488.HS3-GPS or 488.HS3-GLONASS receiver.

Electromagnetic Compatibility, Safety and RoHS2 Directives

5000 series network time servers, when used in accordance with our recommendations, comply with the European Community Electromagnetic Compatibility Directive 2004/108/EC, Low Voltage Directive 2006/95/EC and RoHS2 Directive 2011/65/EU and conform to the following standards:

EN 50121-4-2006 - Full London Underground and Network Rail Infrastructure approval (PA05/03968)
EN 61000-6-2:2005
EN 61000-6-4:2007+A1:2011
EN 55022:2010
EN55024:2010
EN 60950-1:2006

Ordering
Quotation on request.

Please advise:-

Base model required,
Optional input synchronisation modules   *if required*
Optional output interface modules   *if required*
Power option required