401 series clocks and stopwatches
with seven segment display characters

401A.02

front bezel: 144 x 72 x 3mm (5.7" x 2.8" x 0.125")
case body: 132 x 58 x 147mm (5.2" x 2.3" x 5.8")
display: 20 & 14mm (0.8" & 0.6")
visibility: < 7m (20ft)

401A.057

case size: 390 x 90 x 58mm (15.4" x 3.5" x 2.3")
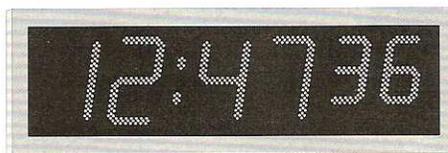display: 57mm (2.3")
visibility: < 25m (75ft)

401A.100

case size: 670 x 180 x 58mm (26.4" x 7.1" x 2.3")
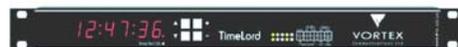display: 100mm (4")
visibility: < 50m (150ft)

401A.170

case size: .S 990 x 260 x 58mm (40.0" x 10.2" x 2.3")
case size: .SE 1070 x 320 x 100mm (42.1" x 12.6" x 3.9")
display: 170mm (6.7")
visibility: < 80m (250ft)

401A.220

case size: .S 1070 x 320 x 58mm (42.1" x 12.6" x 2.3")
case size: .SE 1150 x 380 x 100mm (45.3" x 15.0" x 3.9")
display: 220 & 170mm (8.7" & 6.7")
visibility: < 100m (300ft)

master clocks and systems
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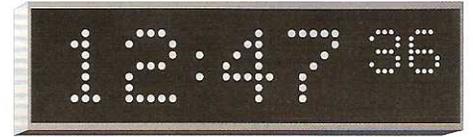| case type	display heights	display colour	order reference	display colour	order reference
DIN style panel mounting case with rear mounting clamps	20 & 14mm	red green	401A.02.R.FP 401A.02.G.FP	blue	401A.02.B.FP
surface mounting with multi-angle mounting brackets	57mm	red green	401A.057.R.S 401A.057.G.S	blue yellow	401A.057.B.S 401A.057.Y.S
flush mounting in a panel with rear access	57mm	red green	401A.057.R.FP 401A.057.G.FP	blue yellow	401A.057.B.FP 401A.057.Y.FP
flush mounting with steel mounting box for solid wall	57mm	red green	401A.057.R.FB 401A.057.G.FB	blue yellow	401A.057.B.FB 401A.057.Y.FB
single sided with ceiling suspension	57mm	red green	401A.057.R.SS 401A.057.G.SS	blue yellow	401A.057.B.SS 401A.057.Y.SS
double sided with ceiling suspension	57mm	red green	401A.057.R.DS 401A.057.G.DS	blue yellow	401A.057.B.DS 401A.057.Y.DS
surface mounting with multi-angle mounting brackets	100mm	red green	401A.100.R.S 401A.100.G.S	blue yellow	401A.100.B.S 401A.100.Y.S
flush mounting in a panel with rear access	100mm	red green	401A.100.R.FP 401A.100.G.FP	blue yellow	401A.100.B.FP 401A.100.Y.FP
flush mounting with steel mounting box for solid wall	100mm	red green	401A.100.R.FB 401A.100.G.FB	blue yellow	401A.100.B.FB 401A.100.Y.FB
single sided with ceiling suspension	100mm	red green	401A.100.R.SS 401A.100.G.SS	blue yellow	401A.100.B.SS 401A.100.Y.SS
double sided with ceiling suspension	100mm	red green	401A.100.R.DS 401A.100.G.DS	blue yellow	401A.100.B.DS 401A.100.Y.DS
surface mounting	170mm	red green	401A.170.R.S 401A.170.G.S	ultra yellow	401A.170.UY.S
surface mounting with IP65 rated case	170mm	red green	401A.170.R.SE 401A.170.G.SE	ultra yellow	401A.170.UY.SE
please inquire for availability of .170 clocks with alternative case types					
surface mounting	220 & 170mm	red green	401A.220.R.S 401A.220.G.S	ultra yellow	401A.220.UY.S
surface mounting with IP65 rated case	220 & 170mm	red green	401A.220.R.SE 401A.220.G.SE	ultra yellow	401A.220.UY.SE
please inquire for availability of .220 clocks with alternative case types					

power supply voltage (230v 50hz ac standard)		add to order reference
operation from 110v 60hz ac supply	- no extra cost	.110vac
operation from a 24v dc power supply	- extra cost option	.24vdc
operation from a 48v dc power supply	- extra cost option	.48vdc
operation from a 48v ac power supply	- extra cost option	.48vac

case colours & finishes		add to order reference
anodised black	- no extra cost	.black
anodised bronze - available on .05 & .057 models only	- no extra cost	.bronze
anodised silver	- no extra cost	.silver
painted off white to RAL 9010	- extra cost option	.RAL9010
any RAL or BS colour painted	- extra cost option	.special

case type	display heights	display colour	order reference	display colour	order reference
surface mounting with multi-angle mounting brackets	50 & 30mm	red green	401A.05.R.S 401A.05.G.S	yellow blue	401A.05.Y.S 401A.05.B.S
flush mounting in a panel with rear access	50 & 30mm	red green	401A.05.R.FP 401A.05.G.FP	yellow blue	401A.05.Y.FP 401A.05.B.FP
flush mounting with steel mounting box for solid wall	50 & 30mm	red green	401A.05.R.FB 401A.05.G.FB	yellow blue	401A.05.Y.FB 401A.05.B.FB
surface mounting with IP65 case	50 & 30mm	red green	401A.05.R.SE 401A.05.G.SE	yellow blue	401A.05.Y.SE 401A.05.B.SE
single sided with ceiling suspension	50 & 30mm	red green	401A.05.R.SS 401A.05.G.SS	yellow blue	401A.05.Y.SS 401A.05.B.SS
double sided with ceiling suspension	50 & 30mm	red green	401A.05.R.DS 401A.05.G.DS	yellow blue	401A.05.Y.DS 401A.05.B.DS
surface mounting with multi-angle mounting brackets	120 & 100mm	red green	401A.12.R.S 401A.12.G.S	ultra yellow	401A.12.UY.S
flush mounting in a panel with rear access	120 & 100mm	red green	401A.12.R.FP 401A.12.G.FP	ultra yellow	401A.12.UY.FP
flush mounting with steel mounting box for solid wall	120 & 100mm	red green	401A.12.R.FB 401A.12.G.FB	ultra yellow	401A.12.UY.FB
surface mounting with IP65 case	120 & 100mm	red green	401A.12.R.SE 401A.12.G.SE	ultra yellow	401A.12.UY.SE
single sided with ceiling suspension	120 & 100mm	red green	401A.12.R.SS 401A.12.G.SS	ultra yellow	401A.12.UY.SS
double sided with ceiling suspension	120 & 100mm	red green	401A.12.R.DS 401A.12.G.DS	ultra yellow	401A.12.UY.DS

401A.05

case size: 305 x 90 x 58mm (12.0" x 3.5" x 2.3")
display: 50 & 30mm (2" & 1.2")
visibility: < 20m (60ft)

401A.12

case size: 670 x 180 x 58mm (26.4" x 7.1" x 2.3")
display: 120 & 100mm (4.7" & 4")
visibility: < 50m (150ft)

| standard features |
|---|
| automatic & manual pre-set display brightness control |
| pre-programmed automatic seasonal time changes. |
| stand-alone or synchronised operation |
| alternating time & date display |
| accuracy - stand-alone operation: typically < than one second per week from 20-25 °C |

| optional features |
|---|
| stopwatch operation - requires 402A or 496a stopwatch controller - page 7 |
| alternating time-temperature display - requires 406 temperature sensor - page 7 |
| remote control by RS232 or RS485 level serial ASCII data commands |

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clock mounting information	page 26

standard time synchronisation options
Synchronisation by alternate and single polarity impulses, GPS and radio time codes, MB serial and MOBAline® time codes. DCF or MSF radio time code or GPS satellite synchronisation requires the appropriate receiver, please refer to page 7 for further information
Control using w482® time code from a · TimeLord series master clock to display time from one of fifteen different time zones

optional wBus® internal interface modules	order reference
to enable time synchronisation from EBU/SMTPE time codes	404.E
to enable time synchronisation from 1Khz modulated IRIG-B & afnor NFS 87 500 time codes	404.I
to enable one clock to act as a master to control up to ten 400A series clocks as slaves	404.M
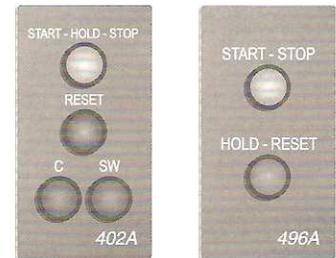
stopwatch control panels
page 7
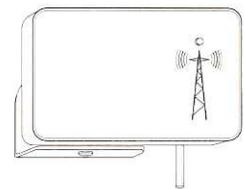
radio & GPS time code receivers
page 7
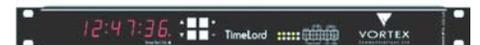
master clocks and systems
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420 series clocks and stopwatches
with seven segment display characters

420A.02

front bezel:	144 x 72 x 3mm (5.7" x 2.8" x 0.125")
case body:	132 x 58 x 147mm (5.2" x 2.3" x 5.8")
display:	25mm (1")
visibility:	< 10m (30ft)

420A.057

case size:	305 x 90 x 58mm (12.0" x 3.5" x 2.3")
display:	57mm (2.3")
visibility:	< 25m (75ft)

420A.100

case size:	480 x 180 x 58mm (18.9" x 7.1" x 2.3")
display:	100mm (4")
visibility:	< 50m (150ft)

420A.170

case size: .S	730 x 260 x 58mm (28.7" x 10.2" x 2.3")
case size: .SE	810 x 320 x 100mm (31.9" x 12.6" x 3.9")
display:	170mm (6.7")
visibility:	< 80m (250ft)
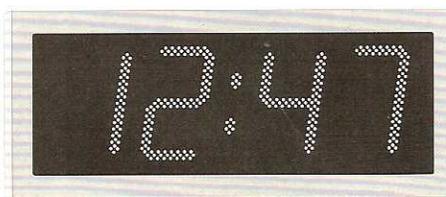
420A.220

case size: .S	810 x 320 x 58mm (31.9" x 12.6" x 2.3")
case size: .SE	890 x 380 x 100mm (34.3" x 14.6" x 3.9")
display:	220mm (8.7")
visibility:	< 100m (300ft)

case type	display height	display colour	order reference	display colour	order reference
DIN style panel mounting case	25mm	red green	420A.02.R.FP 420A.02.G.FP	blue	420A.02.B.FP
surface mounting with multi-angle mounting brackets	57mm	red green	420A.057.R.S 420A.057.G.S	yellow blue	420A.057.Y.S 420A.057.B.S
flush mounting in a panel with rear access	57mm	red green	420A.057.R.FP 420A.057.G.FP	yellow blue	420A.057.Y.FP 420A.057.B.FP
flush mounting with steel mounting box for solid wall	57mm	red green	420A.057.R.FB 420A.057.G.FB	yellow blue	420A.057.Y.FB 420A.057.B.FB
surface mounting with IP65 case	57mm	red green	420A.057.R.SE 420A.057.G.SE	yellow blue	420A.057.Y.SE 420A.057.B.SE
single sided with ceiling suspension	57mm	red green	420A.057.R.SS 420A.057.G.SS	yellow blue	420A.057.Y.SS 420A.057.B.SS
double sided with ceiling suspension	57mm	red green	420A.057.R.DS 420A.057.G.DS	yellow blue	420A.057.Y.DS 420A.057.B.DS
surface mounting with multi-angle mounting brackets	100mm	red green	420A.100.R.S 420A.100.G.S	yellow blue	420A.100.Y.S 420A.100.B.S
flush mounting in a panel with rear access	100mm	red green	420A.100.R.FP 420A.100.G.FP	yellow blue	420A.100.Y.FP 420A.100.B.FP
flush mounting with steel mounting box for solid wall	100mm	red green	420A.100.R.FB 420A.100.G.FB	yellow blue	420A.100.Y.FB 420A.100.B.FB
surface mounting with IP65 case	100mm	red green	420A.100.R.SE 420A.100.G.SE	yellow blue	420A.100.Y.SE 420A.100.B.SE
single sided with ceiling suspension	100mm	red green	420A.100.R.SS 420A.100.G.SS	yellow blue	420A.100.Y.SS 420A.100.B.SS
double sided with ceiling suspension	100mm	red green	420A.100.R.DS 420A.100.G.DS	yellow blue	420A.100.Y.DS 420A.100.B.DS
surface mounting	170mm	red green	420A.170.R.S 420A.170.G.S	ultra yellow	420A.170.UY.S
surface mounting with IP65 rated case	170mm	red green	420A.170.R.SE 420A.170.G.SE	ultra yellow	420A.170.UY.SE
please inquire for availability of **.170** clocks with alternative case types					
surface mounting	220 mm	red green	420A.220.R.S 420A.220.G.S	ultra yellow	420A.220.UY.S
surface mounting with IP65 rated case	220 mm	red green	420A.220.R.SE 420A.220.G.SE	ultra yellow	420A.220.UY.SE
please enquire for availability of **.220** clocks with alternative case types					

power supply voltage (230v 50hz ac standard)		add to order reference
operation from 110v 60hz ac supply	- no extra cost	.110vac
operation from a 24v dc power supply	- extra cost option	.24vdc
operation from a 48v dc power supply	- extra cost option	.48vdc
operation from a 48v ac power supply	- extra cost option	.48vac

| case colours & finishes		add to order reference
anodised black	- no extra cost	.black
anodised bronze - available on .05 & .057 models only	- no extra cost	.bronze
anodised silver	- no extra cost	.silver
painted off white to RAL 9010	- extra cost option	.RAL9010
any RAL or BS colour painted	- extra cost option	.special

case type	display height	display colour	order reference	display colour	order reference
surface mounting with multi-angle mounting brackets	50mm	red green	420A.05.R.S 420A.05.G.S	yellow blue	420A.05.Y.S 420A.05.B.S
flush mounting in a panel with rear access	50mm	red green	420A.05.R.FP 420A.05.G.FP	yellow blue	420A.05.Y.FP 420A.05.B.FP
flush mounting with steel mounting box for solid wall	50mm	red green	420A.05.R.FB 420A.05.G.FB	yellow blue	420A.05.Y.FB 420A.05.B.FB
surface mounting with IP65 case	50mm	red green	420A.05.R.SE 420A.05.G.SE	yellow blue	420A.05.Y.SE 420A.05.B.SE
single sided with ceiling suspension	50mm	red green	420A.05.R.SS 420A.05.G.SS	yellow blue	420A.05.Y.SS 420A.05.B.SS
double sided with ceiling suspension	50mm	red green	420A.05.R.DS 420A.05.G.DS	yellow blue	420A.05.Y.DS 420A.05.B.DS
surface mounting with multi-angle mounting brackets	120mm	red green	420A.12.R.S 420A.12.G.S	ultra yellow	420A.12.UY.S
flush mounting in a panel with rear access	120mm	red green	420A.12.R.FP 420A.12.G.FP	ultra yellow	420A.12.UY.FP
flush mounting with steel mounting box for solid wall	120mm	red green	420A.12.R.FB 420A.12.G.FB	ultra yellow	420A.12.UY.FB
surface mounting with IP65 case	120mm	red green	420A.12.R.SE 420A.12.G.SE	ultra yellow	420A.12.UY.SE
single sided with ceiling suspension	120mm	red green	420A.12.R.SS 420A.12.G.SS	ultra yellow	420A.12.UY.SS
double sided with ceiling suspension	120mm	red green	420A.12.R.DS 420A.12.G.DS	ultra yellow	420A.12.UY.DS
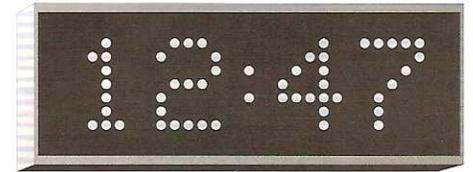
420A.05

case size:	240 x 90 x 58mm (9.5" x 3.5" x 2.3")
display:	50mm (2")
visibility:	< 20m (60ft)

420A.12

case size:	480 x 180 x 58mm (18.9" x 7.1" x 2.3")
display:	120mm (4.7")
visibility:	< 50m (150ft)

standard features
automatic & manual pre-set display brightness control
pre-programmed automatic seasonal time changes
stand-alone or synchronised operation
alternating time & date display
accuracy - stand-alone operation: typically < than one second per week from 20-25 °C

optional features
stopwatch operation - requires 402A or 496a stopwatch controller - page 7
alternating time-temperature display - requires 406 temperature sensor - page 7
remote control by RS232 or RS485 level serial ASCII data commands

external synchronisation information	page 25
clock mounting information	page 26

standard time synchronisation options
Synchronisation by alternate and single polarity impulses, GPS and radio time codes, MB serial and MOBAline® time codes. DCF or MSF radio time code or GPS satellite synchronisation requires the appropriate receiver, please refer to page 7 for further information
Control using w482® time code from a TimeLord series master clock to display time from one of fifteen different time zones

optional w482® internal interface modules	order reference
to enable time synchronisation from EBU/SMTPE time codes	**404.E**
to enable time synchronisation from 1Khz modulated IRIG-B & afnor NFS 87 500 time codes	**404.I**
to enable one clock to act as a master to control up to ten 400A series clocks as slaves	**404.M**

stopwatch control panels
page 7

radio & GPS time code receivers
page 7

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490 series clocks and stopwatches
with analogue seconds display ring

490A.01

case size:	112 x 112 x 58mm (4.4" x 4.4" x 2.3")
display:	14mm (0.6")
visibility:	< 7m (20ft)

490A.02

case size:	144 x 144 x 58mm (5.7" x 5.7" x 2.3")
display:	20mm (0.8")
visibility:	< 10m (30ft)

case type	display heights	display colour	order reference	display colour	order reference
surface mounting with multi-angle brackets	14mm	red green	490A.01.R.S 490A.01.G.S		
flush mounting in a panel with rear access	14mm	red green	490A.01.R.FP 490A.01.G.FP		
flush mounting with steel mounting box for solid wall	14mm	red green	490A.01.R.FB 490A.01.G.FB		
single sided with ceiling suspension	14mm	red green	490A.01.R.SS 490A.01.G.SS		
surface mounting with multi-angle brackets	20mm	red green	490A.02.R.S 490A.02.G.S	blue	490A.02.B.S
flush mounting in a panel with rear access	20mm	red green	490A.02.R.FP 490A.02.G.FP	blue	490A.02.B.FP
flush mounting with steel mounting box for solid wall	20mm	red green	490A.02.R.FB 490A.02.G.FB	blue	490A.02.B.FB
single sided with ceiling suspension	20mm	red green	490A.02.R.SS 490A.02.G.SS	blue	490A.02.B.SS
surface mounting with multi-angle brackets	50 & 30mm	red green blue	490A.05.R.S 490A.05.G.S 490A.05.B.S	green & red*	490A.05.GR.S
flush mounting in a panel with rear access	50 & 30mm	red green blue	490A.05.R.FP 490A.05.G.FP 490A.05.B.FP	green & red*	490A.05.GR.FP
flush mounting with steel mounting box for solid wall	50 & 30mm	red green blue	490A.05.R.FB 490A.05.G.FB 490A.05.B.FB	green & red*	490A.05.GR.FB
single sided with ceiling suspension	50 & 30mm	red green blue	490A.05.R.SS 490A.05.G.SS 490A.05.B.SS	green & red*	490A.05.GR.SS

*green & red clocks have a green display with red five second markers

490A.05

case size:	300 x 300 x 58mm (11.8" x 11.8" x 2.3")
display:	50 & 30mm (2" & 1.2")
visibility:	< 20m (60ft)

master clocks and systems
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internal interface & synchronisation options	page 5
external synchronisation information	page 25
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power supply voltage (230v 50hz ac standard)		add to order reference
operation from 110v 60hz ac supply	- no extra cost	.110vac
operation from a 24v dc power supply	- extra cost option	.24vdc
operation from a 48v dc power supply	- extra cost option	.48vdc
operation from a 48v ac power supply	- extra cost option	.48vac

case colours & finishes		add to order reference
anodised black	- no extra cost	.black
anodised bronze - available on .05 & .057 models only	- no extra cost	.bronze
anodised silver	- no extra cost	.silver
painted off white to RAL 9010	- extra cost option	.RAL9010
any RAL or BS colour painted	- extra cost option	.special

WWW.▼TX.CO.UK

	order reference

up/down stopwatch control

The **402A** up/down stopwatch control unit enables a **401A**, **420A** or **490A** series clock to be used both as a multi-function stopwatch and as a time-of-day clock with the display freely switchable between time-of-day and stopwatch time. The time-of-day count may be synchronised to a number of external sources. The stopwatch function can be programmed to:

- · Count up from zero
- · Count down from a pre-programmed start-time to stop at zero
- · Count down from a pre-programmed start-time to zero, reset and restart from the pre-programmed start-time
- · Count down and then up through zero.

Flush mounting in a panel with rear access	402A
Hand held box with fixing to enable wall mounting	402A.S

split action stopwatch control

The **496A** stopwatch control unit enables a **401A**, **420A** or **490A** series clock to be used as a split action stopwatch

Flush mounting in a panel with rear access	496A
Hand held box with fixing to enable wall mounting	496A.S

temperature sensor

The **406** remote temperature sensor enables a 400A series clock or calendar clock to show an alternating display of time and temperature or static temperature display

Wall mounting with 6m cable	406

radio time code receivers

The **484.02** & **484.03** radio time code receivers are high performance units with dual crystal filters and dual ferrite elements to provide omni-directional capability. The cases are rated to IP65 and are suitable for protected external mounting

60KHz Frequency for MSF reception	484.02
77.5KHz Frequency for DCF reception	484.03

The **484.06** & **484.07** radio time code receivers are low cost units with uni-directional antenna and rotating mounting brackets which are intended for internal use.

60KHz Frequency for MSF reception	484.06
77.5KHz Frequency for DCF reception	484.07

GPS receiver systems

GPS time synchronisation system. Comprising active antenna with post mounting, 8 channel receiver-decoder unit and interconnecting cable. Provides a synchronising signal for time zone displays and 400A series clocks either directly or via a TimeLord master clock. Requires 110v or 230v ac power supply.	488GPS
GPS time synchronisation system. Comprising active antenna with post mounting, 8 channel receiver-decoder unit and interconnecting cable. Provides a synchronising signal for a TimeLord source. Powered via TimeLord Source unit.	488BGPS

IR remote control for time zone displays

The 408 infra-red remote control handset enables a 470, 471, 472, 473, 474 , 475 or 479A time zone display, when used in stand-alone mode, to be programmed and synchronised with a local time reference.	408

START - HOLD - STOP

RESET

C   SW

402A

START - STOP

HOLD - RESET
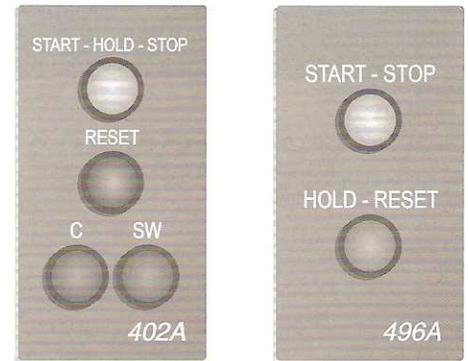
496A

402A & 496A

panel size: 54 x 102 x 27mm (2.1" x 4.0" x 1.1")

A **406** remote temperature sensor is required for an alternating time-temperature display
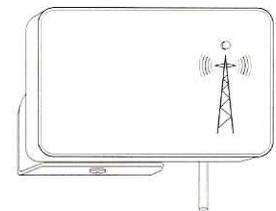
484.06 & 484.07

case size: 90 x 60 x 24mm (3.5" x 2.4" x 1.0")

484.02 & 484.03 (not shown)

case size: 160 x 80 x 55mm (6.3" x 3.1" x 2.2")

408

408 infra-red remote control handset

12:47:36. TimeLord   VORTEX

450 & 451 series multi-language calendar clocks

450A.05

case size: 550 x 90 x 58mm (21.6" x 3.5" x 2.3")
display: 50 & 30mm (2" & 1.2")
visibility: < 20m (60ft)

450A.12

case size: 1450 x 180 x 58mm (57.1" x 7.1" x 2.3")
display: 120 & 100mm (4.7" & 4")
visibility: < 50m (150ft)

451A.05

case size: 550 x 90 x 58mm (21.6" x 3.5" x 2.3")
display: 50 & 30mm (2" & 1.2")
visibility: < 20m (60ft)

451A.12

case size: 1450 x 180 x 58mm (57.1" x 7.1" x 2.3")
display: 120 & 100mm (4.7" & 4")
visibility: < 50m (150ft)

case type	display heights	display colour	order reference	display colour	order reference
surface mounting with multi-angle mounting brackets	50 & 30mm	red green	450A.05.R.S 450A.05.G.S	yellow blue	450A.05.Y.S 450A.05.B.S
flush mounting in a panel with rear access	50 & 30mm	red green	450A.05.R.FP 450A.05.G.FP	yellow blue	450A.05.Y.FP 450A.05.B.FP
flush mounting with steel mounting box for solid wall	50 & 30mm	red green	450A.05.R.FB 450A.05.G.FB	yellow blue	450A.05.Y.FB 450A.05.B.FB
single sided with ceiling suspension	50 & 30mm	red green	450A.05.R.SS 450A.05.G.SS	yellow blue	450A.05.Y.SS 450A.05.B.SS
double sided with ceiling suspension	50 & 30mm	red green	450A.05.R.DS 450A.05.G.DS	yellow blue	450A.05.Y.DS 450A.05.B.DS

case type	display heights	display colour	order reference
surface mounting with multi-angle mounting brackets	120 & 100mm	red green	450A.12.R.S 450A.12.G.S
flush mounting in a panel with rear access	120 & 100mm	red green	450A.12.R.FP 450A.12.G.FP
flush mounting with steel mounting box for solid wall	120 & 100mm	red green	450A.12.R.FB 450A.12.G.FB
single sided with ceiling suspension	120 & 100mm	red green	450A.12.R.SS 450A.12.G.SS
double sided with ceiling suspension	120 & 100mm	red green	450A.12.R.DS 450A.12.G.DS

case type	display heights	display colour	order reference	display colour	order reference
surface mounting with multi-angle mounting brackets	50 & 30mm	red green	451A.05.R.S 451A.05.G.S	yellow blue	451A.05.Y.S 451A.05.B.S
flush mounting in a panel with rear access	50 & 30mm	red green	451A.05.R.FP 451A.05.G.FP	yellow blue	451A.05.Y.FP 451A.05.B.FP
flush mounting with steel mounting box for solid wall	50 & 30mm	red green	451A.05.R.FB 451A.05.G.FB	yellow blue	451A.05.Y.FB 451A.05.B.FB
single sided with ceiling suspension	50 & 30mm	red green	451A.05.R.SS 451A.05.G.SS	yellow blue	451A.05.Y.SS 451A.05.B.SS
double sided with ceiling suspension	50 & 30mm	red green	451A.05.R.DS 451A.05.G.DS	yellow blue	451A.05.Y.DS 451A.05.B.DS

case type	display heights	display colour	order reference
surface mounting with multi-angle mounting brackets	120 & 100mm	red green	451A.12.R.S 451A.12.G.S
flush mounting in a panel with rear access	120 & 100mm	red green	451A.12.R.FP 451A.12.G.FP
flush mounting with steel mounting box for solid wall	120 & 100mm	red green	451A.12.R.FB 451A.12.G.FB
single sided with ceiling suspension	120 & 100mm	red green	451A.12.R.SS 451A.12.G.SS
double sided with ceiling suspension	120 & 100mm	red green	451A.12.R.DS 451A.12.G.DS

power supply voltage (230v 50hz ac standard)		add to order reference
operation from 110v 60hz ac supply	- no extra cost	.110vac
operation from a 24v dc power supply	- extra cost option	.24vdc
operation from a 48v dc power supply	- extra cost option	.48vdc
operation from a 48v ac power supply	- extra cost option	.48vac

case colours & finishes		add to order reference
anodised black	- no extra cost	.black
anodised bronze - available on .05 & .057 models only	- no extra cost	.bronze
anodised silver	- no extra cost	.silver
painted off white to RAL 9010	- extra cost option	.RAL9010
any RAL or BS colour painted	- extra cost option	.special

standard features

automatic & manual pre-set display brightness control

pre-programmed automatic seasonal time changes

stand-alone or synchronised operation

one, two or three alternating languages displayed from choice of 21

accuracy - stand-alone operation: typically < than one second per week from 20-25 °C

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case type	display heights	display colour	order reference	display colour	order reference
surface mounting with multi-angle mounting brackets	50mm	red green	452A.05.R.S 452A.05.G.S	yellow blue	452A.05.Y.S 452A.05.B.S
flush mounting in a panel with rear access	50mm	red green	452A.05.R.FP 452A.05.G.FP	yellow blue	452A.05.Y.FP 452A.05.B.FP
flush mounting with steel mounting box for solid wall	50mm	red green	452A.05.R.FB 452A.05.G.FB	yellow blue	452A.05.Y.FB 452A.05.B.FB
single sided with ceiling suspension	50mm	red green	452A.05.R.SS 452A.05.G.SS	yellow blue	452A.05.Y.SS 452A.05.B.SS
double sided with ceiling suspension	50mm	red green	452A.05.R.DS 452A.05.G.DS	yellow blue	452A.05.Y.DS 452A.05.B.DS
surface mounting	120 & 100mm	red green	452A.12.R.S 452A.12.G.S		
flush mounting in a panel with rear access	120 & 100mm	red green	452A.12.R.FP 452A.12.G.FP		
flush mounting with steel mounting box for solid wall	120 & 100mm	red green	452A.12.R.FB 452A.12.G.FB		
single sided with ceiling suspension	120 & 100mm	red green	452A.12.R.SS 452A.12.G.SS		
double sided with ceiling suspension	120 & 100mm	red green	452A.12.R.DS 452A.12.G.DS		
surface mounting with multi-angle mounting brackets	50mm	red green	453A.05.R.S 453A.05.G.S	yellow blue	453A.05.Y.S 453A.05.B.S
flush mounting in a panel with rear access	50mm	red green	453A.05.R.FP 453A.05.G.FP	yellow blue	453A.05.Y.FP 453A.05.B.FP
flush mounting with steel mounting box for solid wall	50mm	red green	453A.05.R.FB 453A.05.G.FB	yellow blue	453A.05.Y.FB 453A.05.B.FB
single sided with ceiling suspension	50mm	red green	453A.05.R.SS 453A.05.G.SS	yellow blue	453A.05.Y.SS 453A.05.B.SS
double sided with ceiling suspension	50mm	red green	453A.05.R.DS 453A.05.G.DS	yellow blue	453A.05.Y.DS 453A.05.B.DS
surface mounting	120 & 100mm	red green	453A.12.R.S 453A.12.G.S		
flush mounting in a panel with rear access	120 & 100mm	red green	453A.12.R.FP 453A.12.G.FP		
flush mounting with steel mounting box for solid wall	120 & 100mm	red green	453A.12.R.FB 453A.12.G.FB		
single sided with ceiling suspension	120 & 100mm	red green	453A.12.R.SS 453A.12.G.SS		
double sided with ceiling suspension	120 & 100mm	red green	453A.12.R.DS 453A.12.G.DS		

452A.05

case size:	480 x 180 x 58mm (18.9" x 7.1" x 2.3")
display:	50mm (2")
visibility:	< 25m (75ft)

452A.12

case size:	940 x 400 x 58mm (18.9" x 7.1" x 2.3")
display	120 & 100mm (4.7" & 4")
visibility:	50m (150ft)

453A.05

case size:	480 x 180 x 58mm (18.9" x 7.1" x 2.3")
display:	50mm (2")
visibility:	< 25m (75ft)

453A.12

case size:	940 x 400 x 58mm (18.9" x 7.1" x 2.3")
display:	120 & 100mm (4.7" & 4")
visibility:	< 50m (150ft)

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standard time synchronisation options

Synchronisation by alternate and single polarity impulses, GPS and radio time codes, MB serial and MOBAline® time codes. DCF or MSF radio time code or GPS satellite synchronisation requires the appropriate receiver, please refer to page 7 for further information.

Control using w482® time code from a TimeLord series master clock to display time from one of fifteen different time zones.

optional w482® internal interface modules	order reference
to enable time synchronisation from EBU/SMTPE time codes	404.E
to enable time synchronisation from 1Khz modulated IRIG-B & afnor NFS 87 500 time codes	404.I
to enable one clock to act as a master to control up to ten 400A series clocks as slaves	404.M

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454A.05

case size:	300 x 300 x 58mm (11.8" x 11.8" x 2.3")
display:	50mm (2")
visibility:	< 25m (75ft)

454A.12

case size:	600 x 600 x 58mm (23.6" x 23.6" x 2.3")
display:	120 & 100mm (4.7" & 4")
visibility:	< 50m (150ft)

455A.057

case size:	450 x 240 x 58mm (17.7" x 9.5" x 2.3")
display:	57mm (2.3")
visibility:	< 25m (75ft)

455A.100

case size:	800 x 425 x 58mm (31.5" x 16.7" x 2.3")
display:	100mm (4")
visibility:	< 50m (150ft)
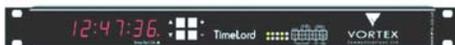
master clocks and systems
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case type	display heights	display colour	order reference	display colour	order reference
surface mounting with multi-angle mounting brackets	50mm	red green	454A.05.R.S 454A.05.G.S	yellow blue	454A.05.Y.S 454A.05.B.S
flush mounting in a panel with rear access	50mm	red green	454A.05.R.FP 454A.05.G.FP	yellow blue	454A.05.Y.FP 454A.05.B.FP
flush mounting with steel mounting box for solid wall	50mm	red green	454A.05.R.FB 454A.05.G.FB	yellow blue	454A.05.Y.FB 454A.05.B.FB
single sided with ceiling suspension	50mm	red green	454A.05.R.SS 454A.05.G.SS	yellow blue	454A.05.Y.SS 454A.05.B.SS
double sided with ceiling suspension	50mm	red green	454A.05.R.DS 454A.05.G.DS	yellow blue	454A.05.Y.DS 454A.05.B.DS
surface mounting with multi-angle mounting brackets	120 & 100mm	red green	454A.12.R.S 454A.12.G.S		
flush mounting in a panel with rear access	120 & 100mm	red green	454A.12.R.FP 454A.12.G.FP		
flush mounting with steel mounting box for solid wall	120 & 100mm	red green	454A.12.R.FB 454A.12.G.FB		
single sided with ceiling suspension	120 & 100mm	red green	454A.12.R.SS 454A.12.G.SS		
double sided with ceiling suspension	120 & 100mm	red green	454A.12.R.DS 454A.12.G.DS		

455 series calendar clocks with seven segment characters

case type	display heights	display colour	order reference	display colour	order reference
surface mounting with multi-angle mounting brackets	57mm	red green	455A.057.R.S 455A.057.G.S	yellow blue	455A.057.Y.S 455A.057.B.S
flush mounting in a panel with rear access	57mm	red green	455A.057.R.FP 455A.057.G.FP	yellow blue	455A.057.Y.FP 455A.057.B.FP
flush mounting with steel mounting box for solid wall	57mm	red green	455A.057.R.FB 455A.057.G.FB	yellow blue	455A.057.Y.FB 455A.057.B.FB
single sided with ceiling suspension	57mm	red green	455A.057.R.SS 455A.057.G.SS	yellow blue	455A.057.Y.SS 455A.057.B.SS
double sided with ceiling suspension	57mm	red green	455A.057.R.DS 455A.057.G.DS	yellow blue	455A.057.Y.DS 455A.057.B.DS
surface mounting with multi-angle mounting brackets	100mm	red green	455A.100.R.S 455A.100.G.S	yellow blue	455A.100.Y.S 455A.100.B.S
flush mounting in a panel with rear access	100mm	red green	455A.100.R.FP 455A.100.G.FP	yellow blue	455A.100.Y.FP 455A.100.B.FP
flush mounting with steel mounting box for solid wall	100mm	red green	455A.100.R.FB 455A.100.G.FB	yellow blue	455A.100.Y.FB 455A.100.B.FB
single sided with ceiling suspension	100mm	red green	455A.100.R.SS 455A.100.G.SS	yellow blue	455A.100.Y.SS 455A.100.B.SS
double sided with ceiling suspension	100mm	red green	455A.100.R.DS 455A.100.G.DS	yellow blue	455A.100.Y.DS 455A.100.B.DS

power supply voltage (230v 50hz ac standard)		add to order reference
operation from 110v 60hz ac supply	- no extra cost	.110vac
operation from a 24v dc power supply	- extra cost option	.24vdc
operation from a 48v dc power supply	- extra cost option	.48vdc
operation from a 48v ac power supply	- extra cost option	.48vac

case colours & finishes		add to order reference
anodised black	- no extra cost	.black
anodised bronze - available on .05 & .057 models only	- no extra cost	.bronze
anodised silver	- no extra cost	.silver
painted off white to RAL 9010	- extra cost option	.RAL9010
any RAL or BS colour painted	- extra cost option	.special

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case type	display heights	display colour	order reference	display colour	order reference
multi-language calendar clock					
surface mounting with multi-angle brackets	50 & 30mm	red green	460A.05.R.S 460A.05.G.S	yellow blue	460A.05.Y.S 460A.05.B.S
flush mounting in a panel with rear access	50 & 30mm	red green	460A.05.R.FP 460A.05.G.FP	yellow blue	460A.05.Y.FP 460A.05.B.FP
flush mounting with steel mounting box for solid wall	50 & 30mm	red green	460A.05.R.FB 460A.05.G.FB	yellow blue	460A.05.Y.FB 460A.05.B.FB
single sided with ceiling suspension	50 & 30mm	red green	460A.05.R.SS 460A.05.G.SS	yellow blue	460A.05.Y.SS 460A.05.B.SS
double sided with ceiling suspension	50 & 30mm	red green	460A.05.R.DS 460A.05.G.DS	yellow blue	460A.05.Y.DS 460A.05.B.DS
Julian calendar clock					
surface mounting with multi-angle brackets	57mm	red green	461A.057.R.S 461A.057.G.S	yellow blue	461A.057.Y.S 461A.057.B.S
flush mounting in a panel with rear access	57mm	red green	461A.057.R.FP 461A.057.G.FP	yellow blue	461A.057.Y.FP 461A.057.B.FP
single sided with ceiling suspension	57mm	red green	461A.057.R.SS 461A.057.G.SS	yellow blue	461A.057.Y.SS 461A.057.B.SS
double sided with ceiling suspension	57mm	red green	461A.057.R.DS 461A.057.G.DS	yellow blue	461A.057.Y.DS 461A.057.B.DS
surface mounting with multi-angle brackets	100mm	red green	461A.100.R.S 461A.100.G.S	yellow blue	461A.100.Y.S 461A.100.B.S
flush mounting in a panel with rear access	100mm	red green	461A.100.R.FP 461A.100.G.FP	yellow blue	461A.100.Y.FP 461A.100.B.FP
single sided with ceiling suspension	100mm	red green	461A.100.R.SS 461A.100.G.SS	yellow blue	461A.100.Y.SS 461A.100.B.SS
double sided with ceiling suspension	100mm	red green	461A.100.R.DS 461A.100.G.DS	yellow blue	461A.100.Y.DS 461A.100.B.DS
multi-language calendar only					
surface mounting with multi-angle brackets	50mm	red green	467A.05.R.S 467A.05.G.S	yellow blue	467A.05.Y.S 467A.05.B.S
flush mounting in a panel with rear access	50mm	red green	467A.05.R.FP 467A.05.G.FP	yellow blue	467A.05.Y.FP 467A.05.B.FP
flush mounting with steel mounting box for solid wall	50mm	red green	467A.05.R.FB 467A.05.G.FB	yellow blue	467A.05.Y.FB 467A.05.B.FB
single sided with ceiling suspension	50mm	red green	467A.05.R.SS 467A.05.G.SS	yellow blue	467A.05.Y.SS 467A.05.B.SS
double sided with ceiling suspension	50mm	red green	467A.05.R.DS 467A.05.G.DS	yellow blue	467A.05.Y.DS 467A.05.B.DS

460A.05

case size: 460 x 90 x 58mm (18.1" x 3.5" x 2.3")
display: 50 & 30mm (2" & 1.2")
visibility: < 20m (60ft)

461A.057

case size: 570 x 90 x 58mm (22.4" x 3.5 x 2.3")
display: 57mm (2.3")
visibility: < 25m (75ft)

461A.100

case size: 1000 x 180 x 58mm (39.4" x 7.1" x 2.3")
display: 100mm (4")
visibility: < 50m (150ft)

467A.05

case size: 460 x 90 x 58mm (18.1" x 3.5" x 2.3")
display: 50mm (2")
visibility: < 20m (60ft)

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standard time synchronisation options

Synchronisation by alternate and single polarity impulses, GPS time signals, MB serial and MOBAline® time codes. GPS satellite synchronisation requires the appropriate receiver, please refer to page 7 for further information.

Control using w482® time code from a TimeLord series master clock to display time from one of fifteen different time zones.

optional w482® internal interface modules	order reference
to enable time synchronisation from EBU/SMTPE time codes	404.E
to enable time synchronisation from 1Khz modulated IRIG-B & afnor NFS 87 500 time codes	404.I
to enable one clock to act as a master to control up to ten 400A series clocks as slaves	404.M

standard features

automatic & manual pre-set display brightness control

pre-programmed automatic seasonal time changes

stand-alone or synchronised operation

one, two or three alternating languages displayed from choice of 21

accuracy - stand-alone operation: typically < than one second per week from 20-25 °C

470A/2.05 -470A/7.05 time zone displays

```
THU 26 JUN
CHICAGO    06:47
LONDON     12:47
ZURICH     13:47
TOKYO      21:47
SYDNEY     22:47
```

470A/2.05 - 2 zones + calendar
case size: 525 x 390 x 58mm (20.7" x 15.4" x 2.3")

470A/3.05 - 3 zones + calendar
case size: 525 x 510 x 58mm (20.7" x 20.1" x 2.3")

470A/4.05 - 4 zones + calendar
case size: 525 x 630 x 58mm (20.7" x 24.8" x 2.3")

470A/5.05 - 5 zones + calendar
case size: 525 x 750 x 58mm (20.7" x 29.6"x 2.3")

470A/6.05 - 6 zones + calendar
case size: 525 x 870 x 58mm (20.7" x 34.3" x 2.3")

470A/7.05 - 7 zones + calendar
case size: 525 x 990 x 58mm (20.7" x 39.0" x 2.3")

display: 50mm (2")
visibility: < 25m (75ft)

The **470A/x.05** range of time zone displays are now available as **470AIL30** models with illuminated location legends on every zone.

Each time zone on the **470AIL30/x.05** has a 30mm high 10 character location legend display which can be user programmed to indicate a custom time zone name or location.

case type	time zones	display height	display colour	order reference	display colour	order reference
surface mounting	2	50mm	red green	470A/2.05.R.S 470A/2.05.G.S	yellow blue	470A/2.05.Y.S 470A/2.05.B.S
flush mounting in a panel with rear access	2	50mm	red green	470A/2.05.R.FP 470A/2.05.G.FP	yellow blue	470A/2.05.Y.FP 470A/2.05.B.FP
flush mounting with a steel mounting box for solid wall	2	50mm	red green	470A/2.05.R.FB 470A/2.05.G.FB	yellow blue	470A/2.05.Y.FB 470A/2.05.B.FB
single sided with ceiling suspension	2	50mm	red green	470A/2.05.R.SS 470A/2.05.G.SS	yellow blue	470A/2.05.Y.SS 470A/2.05.B.SS
surface mounting	3	50mm	red green	470A/3.05.R.S 470A/3.05.G.S	yellow blue	470A/3.05.Y.S 470A/3.05.B.S
flush mounting in a panel with rear access	3	50mm	red green	470A/3.05.R.FP 470A/3.05.G.FP	yellow blue	470A/3.05.Y.FP 470A/3.05.B.FP
flush mounting with a steel mounting box for solid wall	3	50mm	red green	470A/3.05.R.FB 470A/3.05.G.FB	yellow blue	470A/3.05.Y.FB 470A/3.05.B.FB
single sided with ceiling suspension	3	50mm	red green	470A/3.05.R.SS 470A/3.05.G.SS	yellow blue	470A/3.05.Y.SS 470A/3.05.B.SS
surface mounting	4	50mm	red green	470A/4.05.R.S 470A/4.05.G.S	yellow blue	470A/4.05.Y.S 470A/4.05.B.S
flush mounting in a panel with rear access	4	50mm	red green	470A/4.05.R.FP 470A/4.05.G.FP	yellow blue	470A/4.05.Y.FP 470A/4.05.B.FP
flush mounting with a steel mounting box for solid wall	4	50mm	red green	470A/4.05.R.FB 470A/4.05.G.FB	yellow blue	470A/4.05.Y.FB 470A/4.05.B.FB
single sided with ceiling suspension	4	50mm	red green	470A/4.05.R.SS 470A/4.05.G.SS	yellow blue	470A/4.05.Y.SS 470A/4.05.B.SS
surface mounting	5	50mm	red green	470A/5.05.R.S 470A/5.05.G.S	yellow blue	470A/5.05.Y.S 470A/5.05.B.S
flush mounting in a panel with rear access	5	50mm	red green	470A/5.05.R.FP 470A/5.05.G.FP	yellow blue	470A/5.05.Y.FP 470A/5.05.B.FP
flush mounting with a steel mounting box for solid wall	5	50mm	red green	470A/5.05.R.FB 470A/5.05.G.FB	yellow blue	470A/5.05.Y.FB 470A/5.05.B.FB
single sided with ceiling suspension	5	50mm	red green	470A/5.05.R.SS 470A/5.05.G.SS	yellow blue	470A/5.05.Y.SS 470A/5.05.B.SS
surface mounting	6	50mm	red green	470A/6.05.R.S 470A/6.05.G.S	yellow blue	470A/6.05.Y.S 470A/6.05.B.S
flush mounting in a panel with rear access	6	50mm	red green	470A/6.05.R.FP 470A/6.05.G.FP	yellow blue	470A/6.05.Y.FP 470A/6.05.B.FP
flush mounting with a steel mounting box for solid wall	6	50mm	red green	470A/6.05.R.FB 470A/6.05.G.FB	yellow blue	470A/6.05.Y.FB 470A/6.05.B.FB
single sided with ceiling suspension	6	50mm	red green	470A/6.05.R.SS 470A/6.05.G.SS	yellow blue	470A/6.05.Y.SS 470A/6.05.B.SS
surface mounting	7	50mm	red green	470A/7.05.R.S 470A/7.05.G.S	yellow blue	470A/7.05.Y.S 470A/7.05.B.S
flush mounting in a panel with rear access	7	50mm	red green	470A/7.05.R.FP 470A/7.05.G.FP	yellow blue	470A/7.05.Y.FP 470A/7.05.B.FP
flush mounting with a steel mounting box for solid wall	7	50mm	red green	470A/7.05.R.FB 470A/7.05.G.FB	yellow blue	470A/7.05.Y.FB 470A/7.05.B.FB
single sided with ceiling suspension	7	50mm	red green	470A/7.05.R.SS 470A/7.05.G.SS	yellow blue	470A/7.05.Y.SS 470A/7.05.B.SS

standard features

customer specified choice of time zone locations and legend style

pre-programmed automatic seasonal time changes

stand-alone operation or central control via a TimeLord series master clock. (7 zone units must be controlled with a master clock)

universal 100 - 250v 50/60hz ac power supply

case colours & finishes		add to order reference
anodised black	- no extra cost	.black
anodised silver	- no extra cost	.silver
painted off white to RAL 9010	- extra cost option	.RAL9010
any RAL or BS colour painted	- extra cost option	.special

case type	time zones	display height	display colour	order reference	display colour	order reference
surface mounting	2	50mm	red green	472A/2.05.R.S 472A/2.05.G.S	yellow blue	472A/2.05.Y.S 472A/2.05.B.S
flush mounting in a panel with rear access	2	50mm	red green	472A/2.05.R.FP 472A/2.05.G.FP	yellow blue	472A/2.05.Y.FP 472A/2.05.B.FP
flush mounting with steel mounting box for solid wall	2	50mm	red green	472A/2.05.R.FB 472A/2.05.G.FB	yellow blue	472A/2.05.Y.FB 472A/2.05.B.FB
single sided with ceiling suspension	2	50mm	red green	472A/2.05.R.SS 472A/2.05.G.SS	yellow blue	472A/2.05.Y.SS 472A/2.05.B.SS
surface mounting	3	50mm	red green	472A/3.05.R.S 472A/3.05.G.S	yellow blue	472A/3.05.Y.S 472A/3.05.B.S
flush mounting in a panel with rear access	3	50mm	red green	472A/3.05.R.FP 472A/3.05.G.FP	yellow blue	472A/3.05.Y.FP 472A/3.05.B.FP
flush mounting with steel mounting box for solid wall	3	50mm	red green	472A/3.05.R.FB 472A/3.05.G.FB	yellow blue	472A/3.05.Y.FB 472A/3.05.B.FB
single sided with ceiling suspension	3	50mm	red green	472A/3.05.R.SS 472A/3.05.G.SS	yellow blue	472A/3.05.Y.SS 472A/3.05.B.SS
surface mounting	4	50mm	red green	472A/4.05.R.S 472A/4.05.G.S	yellow blue	472A/4.05.Y.S 472A/4.05.B.S
flush mounting in a panel with rear access	4	50mm	red green	472A/4.05.R.FP 472A/4.05.G.FP	yellow blue	472A/4.05.Y.FP 472A/4.05.B.FP
flush mounting with steel mounting box for solid wall	4	50mm	red green	472A/4.05.R.FB 472A/4.05.G.FB	yellow blue	472A/4.05.Y.FB 472A/4.05.B.FB
single sided with ceiling suspension	4	50mm	red green	472A/4.05.R.SS 472A/4.05.G.SS	yellow blue	472A/4.05.Y.SS 472A/4.05.B.SS
surface mounting	5	50mm	red green	472A/5.05.R.S 472A/5.05.G.S	yellow blue	472A/5.05.Y.S 472A/5.05.B.S
flush mounting in a panel with rear access	5	50mm	red green	472A/5.05.R.FP 472A/5.05.G.FP	yellow blue	472A/5.05.Y.FP 472A/5.05.B.FP
flush mounting with steel mounting box for solid wall	5	50mm	red green	472A/5.05.R.FB 472A/5.05.G.FB	yellow blue	472A/5.05.Y.FB 472A/5.05.B.FB
single sided with ceiling suspension	5	50mm	red green	472A/5.05.R.SS 472A/5.05.G.SS	yellow blue	472A/5.05.Y.SS 472A/5.05.B.SS
surface mounting	6	50mm	red green	472A/6.05.R.S 472A/6.05.G.S	yellow blue	472A/6.05.Y.S 472A/6.05.B.S
flush mounting in a panel with rear access	6	50mm	red green	472A/6.05.R.FP 472A/6.05.G.FP	yellow blue	472A/6.05.Y.FP 472A/6.05.B.FP
flush mounting with steel mounting box for solid wall	6	50mm	red green	472A/6.05.R.FB 472A/6.05.G.FB	yellow blue	472A/6.05.Y.FB 472A/6.05.B.FB
single sided with ceiling suspension	6	50mm	red green	472A/6.05.R.SS 472A/6.05.G.SS	yellow blue	472A/6.05.Y.SS 472A/6.05.B.SS
surface mounting	8	50mm	red green	472A/8.05.R.S 472A/8.05.G.S	yellow blue	472A/8.05.Y.S 472A/8.05.B.S
flush mounting in a panel with rear access	8	50mm	red green	472A/8.05.R.FP 472A/8.05.G.FP	yellow blue	472A/8.05.Y.FP 472A/8.05.B.FP
flush mounting with steel mounting box for solid wall	8	50mm	red green	472A/8.05.R.FB 472A/8.05.G.FB	yellow blue	472A/8.05.Y.FB 472A/8.05.B.FB
single sided with ceiling suspension	8	50mm	red green	472A/8.05.R.SS 472A/8.05.G.SS	yellow blue	472A/8.05.Y.SS 472A/8.05.B.SS

The 472A/x.05 range of time zone displays are now available as 472AIL30 models with illuminated location legends on every zone.

Each time zone on the 472AIL30/x.05 has a 30mm high 10 character location legend display which can be user programmed to indicate a custom time zone name or location.

external synchronisation information	page 25
display mounting information	page 26
accuracy - stand-alone operation	typically < than one second per week from 20-25 °C

Chicago 06:47
New York 07:47
London 12:47
Zurich 13:47
Tokyo 21:47
Sydney 22:47

472A/2.05 - 2 zones
case size: 525 x 270 x 58mm (20.7" x 10.6" x 2.3")

472A/3.05 - 3 zones
case size: 525 x 390 x 58mm (20.7" x 15.4" x 2.3")

472A/4.05 - 4 zones
case size: 525 x 510 x 58mm (20.7" x 20.1" x 2.3")

472A/5.05 - 5 zones
case size: 525 x 630 x 58mm (20.7" x 24.8" x 2.3")

472A/6.05 - 6 zones
case size: 525 x 750 x 58mm (20.7" x 29.5" x 2.3")

472A/8.05 - 8 zones
case size: 525 x 990 x 58mm (20.7" x 39.0" x 2.3")

display: 50mm (2")
visibility: < 25m (75ft)

options

special case colours and finishes

type 408 remote control handset - page 7

'seconds' display on all time zones

removable zone identification plates

time synchronisation by GPS time signal receivers - page 7

time synchronisation from UTC referenced IRIG-B or afnor NFS 87 500 time code

centralised control using TimeLord series master clocks - pages 21 - 23

10Base-T Ethernet option to enable centralised control from NTP Ethernet time server - see page 25

474A/3.025 - 474A/8.025 time zone displays

CHICAGO	NEW YORK	LONDON	PARIS	TOKYO
06:47	07:47	12:47	13:47	20:47

474A/3.025 - 3 zones

case size: 454 x 180 x 58mm (17.9" x 7.1" x 2.3")

474A/4.025 - 4 zones

case size: 604 x 180 x 58mm (25.2" x 7.1" x 2.3")

474A/5.025 - 5 zones

case size: 754 x 180 x 58mm (29.7" x 7.1" x 2.3")

474A/6.025 - 6 zones

case size: 904 x 180 x 58mm (37.0" x 7.1" x 2.3")

474A/8.025 - 8 zones

case size: 1204 x 180 x 58mm (47.4" x 7.1" x 2.3")

display: 25mm (1")
visibility: < 10m (30ft)

case type	time zones	display height	display colour	order reference	display colour	order reference
surface mounting	3	25mm	red green	474A/3.025.R.S 474A/3.025.G.S	yellow	474A/3.025.Y.S
flush mounting in a panel with rear access	3	25mm	red green	474A/3.025.R.FP 474A/3.025.G.FP	yellow	474A/3.025.Y.FP
flush mounting with steel mounting box for solid wall	3	25mm	red green	474A/3.025.R.FB 474A/3.025.G.FB	yellow	474A/3.025.Y.FB
single sided with ceiling suspension	3	25mm	red green	474A/3.025.R.SS 474A/3.025.G.SS	yellow	474A/3.025.Y.SS
double sided with ceiling suspension	3	25mm	red green	474A/3.025.R.DS 474A/3.025.G.DS	yellow	474A/3.025.Y.DS
surface mounting	4	25mm	red green	474A/4.025.R.S 474A/4.025.G.S	yellow	474A/4.025.Y.S
flush mounting in a panel with rear access	4	25mm	red green	474A/4.025.R.FP 474A/4.025.G.FP	yellow	474A/4.025.Y.FP
flush mounting with steel mounting box for solid wall	4	25mm	red green	474A/4.025.R.FB 474A/4.025.G.FB	yellow	474A/4.025.Y.FB
single sided with ceiling suspension	4	25mm	red green	474A/4.025.R.SS 474A/4.025.G.SS	yellow	474A/4.025.Y.SS
double sided with ceiling suspension	4	25mm	red green	474A/4.025.R.DS 474A/4.025.G.DS	yellow	474A/4.025.Y.DS
surface mounting	5	25mm	red green	474A/5.025.R.S 474A/5.025.G.S	yellow	474A/5.025.Y.S
flush mounting in a panel with rear access	5	25mm	red green	474A/5.025.R.FP 474A/5.025.G.FP	yellow	474A/5.025.Y.FP
flush mounting with steel mounting box for solid wall	5	25mm	red green	474A/5.025.R.FB 474A/5.025.G.FB	yellow	474A/5.025.Y.FB
single sided with ceiling suspension	5	25mm	red green	474A/5.025.R.SS 474A/5.025.G.SS	yellow	474A/5.025.Y.SS
double sided with ceiling suspension	5	25mm	red green	474A/5.025.R.DS 474A/5.025.G.DS	yellow	474A/5.025.Y.DS
surface mounting	6	25mm	red green	474A/6.025.R.S 474A/6.025.G.S	yellow	474A/6.025.Y.S
flush mounting in a panel with rear access	6	25mm	red green	474A/6.025.R.FP 474A/6.025.G.FP	yellow	474A/6.025.Y.FP
flush mounting with steel mounting box for solid wall	6	25mm	red green	474A/6.025.R.FB 474A/6.025.G.FB	yellow	474A/6.025.Y.FB
single sided with ceiling suspension	6	25mm	red green	474A/6.025.R.SS 474A/6.025.G.SS	yellow	474A/6.025.Y.SS
double sided with ceiling suspension	6	25mm	red green	474A/6.025.R.DS 474A/6.025.G.DS	yellow	474A/6.025.Y.DS
surface mounting	8	25mm	red green	474A/8.025.R.S 474A/8.025.G.S	yellow	474A/8.025.Y.S
flush mounting in a panel with rear access	8	25mm	red green	474A/8.025.R.FP 474A/8.025.G.FP	yellow	474A/8.025.Y.FP
flush mounting with steel mounting box for solid wall	8	25mm	red green	474A/8.025.R.FB 474A/8.025.G.FB	yellow	474A/8.025.Y.FB
single sided with ceiling suspension	8	25mm	red green	474A/8.025.R.SS 474A/8.025.G.SS	yellow	474A/8.025.Y.SS
double sided with ceiling suspension	8	25mm	red green	474A/8.025.R.DS 474A/8.025.G.DS	yellow	474A/8.025.Y.DS

standard features

customer specified choice of time zone locations and legend style

pre-programmed automatic seasonal time changes

stand-alone operation or central control via a TimeLord series master clock. (8 zone units must be controlled with a master clock)

universal 100 - 250v 50/60hz ac power supply

case colours & finishes		add to order reference
anodised black	- no extra cost	.black
anodised silver	- no extra cost	.silver
painted off white to RAL 9010	- extra cost option	.RAL9010
any RAL or BS colour painted	- extra cost option	.special

WWW.◢TX.CO.UK

case type	time zones	display height	display colour	order reference	display colour	order reference
surface mounting	3	50mm	red green	474A/3.05.R.S 474A/3.05.G.S	yellow blue	474A/3.05.Y.S 474A/3.05.B.S
flush mounting in a panel with rear access	3	50mm	red green	474A/3.05.R.FP 474A/3.05.G.FP	yellow blue	474A/3.05.Y.FP 474A/3.05.B.FP
flush mounting with steel mounting box for solid wall	3	50mm	red green	474A/3.05.R.FB 474A/3.05.G.FB	yellow blue	474A/3.05.Y.FB 474A/3.05.B.FB
single sided with ceiling suspension	3	50mm	red green	474A/3.05.R.SS 474A/3.05.G.SS	yellow blue	474A/3.05.Y.SS 474A/3.05.B.SS
double sided with ceiling suspension	3	50mm	red green	474A/3.05.R.DS 474A/3.05.G.DS	yellow blue	474A/3.05.Y.DS 474A/3.05.B.DS
surface mounting	4	50mm	red green	474A/4.05.R.S 474A/4.05.G.S	yellow blue	474A/4.05.Y.S 474A/4.05.B.S
flush mounting in a panel with rear access	4	50mm	red green	474A/4.05.R.FP 474A/4.05.G.FP	yellow blue	474A/4.05.Y.FP 474A/4.05.B.FP
flush mounting with steel mounting box for solid wall	4	50mm	red green	474A/4.05.R.FB 474A/4.05.G.FB	yellow blue	474A/4.05.Y.FB 474A/4.05.B.FB
single sided with ceiling suspension	4	50mm	red green	474A/4.05.R.SS 474A/4.05.G.SS	yellow blue	474A/4.05.Y.SS 474A/4.05.B.SS
double sided with ceiling suspension	4	50mm	red green	474A/4.05.R.DS 474A/4.05.G.DS	yellow blue	474A/4.05.Y.DS 474A/4.05.B.DS
surface mounting	5	50mm	red green	474A/5.05.R.S 474A/5.05.G.S	yellow blue	474A/5.05.Y.S 474A/5.05.B.S
flush mounting in a panel with rear access	5	50mm	red green	474A/5.05.R.FP 474A/5.05.G.FP	yellow blue	474A/5.05.Y.FP 474A/5.05.B.FP
flush mounting with steel mounting box for solid wall	5	50mm	red green	474A/5.05.R.FB 474A/5.05.G.FB	yellow blue	474A/5.05.Y.FB 474A/5.05.B.FB
single sided with ceiling suspension	5	50mm	red green	474A/5.05.R.SS 474A/5.05.G.SS	yellow blue	474A/5.05.Y.SS 474A/5.05.B.SS
double sided with ceiling suspension	5	50mm	red green	474A/5.05.R.DS 474A/5.05.G.DS	yellow blue	474A/5.05.Y.DS 474A/5.05.B.DS
surface mounting	6	50mm	red green	474A/6.05.R.S 474A/6.05.G.S	yellow blue	474A/6.05.Y.S 474A/6.05.B.S
flush mounting in a panel with rear access	6	50mm	red green	474A/6.05.R.FP 474A/6.05.G.FP	yellow blue	474A/6.05.Y.FP 474A/6.05.B.FP
flush mounting with steel mounting box for solid wall	6	50mm	red green	474A/6.05.R.FB 474A/6.05.G.FB	yellow blue	474A/6.05.Y.FB 474A/6.05.B.FB
single sided with ceiling suspension	6	50mm	red green	474A/6.05.R.SS 474A/6.05.G.SS	yellow blue	474A/6.05.Y.SS 474A/6.05.B.SS
double sided with ceiling suspension	6	50mm	red green	474A/6.05.R.DS 474A/6.05.G.DS	yellow blue	474A/6.05.Y.DS 474A/6.05.B.DS
surface mounting	8	50mm	red green	474A/8.05.R.S 474A/8.05.G.S	yellow blue	474A/8.05.Y.S 474A/8.05.B.S
flush mounting in a panel with rear access	8	50mm	red green	474A/8.05.R.FP 474A/8.05.G.FP	yellow blue	474A/8.05.Y.FP 474A/8.05.B.FP
flush mounting with steel mounting box for solid wall	8	50mm	red green	474A/8.05.R.FB 474A/8.05.G.FB	yellow blue	474A/8.05.Y.FB 474A/8.05.B.FB
single sided with ceiling suspension	8	50mm	red green	474A/8.05.R.SS 474A/8.05.G.SS	yellow blue	474A/8.05.Y.SS 474A/8.05.B.SS
double sided with ceiling suspension	8	50mm	red green	474A/8.05.R.DS 474A/8.05.G.DS	yellow blue	474A/8.05.Y.DS 474A/8.05.B.DS

external synchronisation information	page 25
display mounting information	page 26
accuracy - stand-alone operation	typically < than one second per week from 20-25 °C

Denver 05:47   **London** 12:47   **Moscow** 15:47

474A/3.05 - 3 zones
case size: 904 x 300 x 58mm (35.6" x 11.8" x 2.3")

474A/4.05 - 4 zones
case size: 1204 x 300 x 58mm (47.0" x 11.8" x 2.3")

474A/5.05 - 5 zones
case size: 1504 x 300 x 58mm (59.2" x 11.8" x 2.3")

474A/6.05 - 6 zones
case size: 1804 x 300 x 58mm (71.0" x 11.8" x 2.3")

474A/8.05 - 8 zones
case size: 2408 x 300 x 58mm (94.8" x 11.8" x 2.3")
(supplied as two off four zone sections)

display: 50mm (2")
visibility: < 25m (75ft)

The **474A/x.05** range of time zone displays are now available as **474AIL30/x.05** or **474AIL50/x.05** models with illuminated location legends on every zone.

Each time zone on the **474AIL30/x.05** has a 30mm high 10 character location legend display which can be user programmed to indicate a custom time zone name or location.

Each time zone on the **474AIL50/x.05** has a 50mm high 10 character location legend display which can be user programmed to indicate a custom time zone name or location.

options

special case colours and finishes

removable zone identification plates

'seconds' display for one or all time zones

calendar information at one end or centre of display (474A/x.05 only)

type 408 remote control handset - page 7

time synchronisation by GPS time signal receivers - page 7

time synchronisation from UTC referenced IRIG-B or afnor NFS 87 500 time code

centralised control using TimeLord series master clocks - pages 21 - 23

10Base-T Ethernet option to enable centralised control from NTP Ethernet time server - see page 25

LONDON FRANKFURT HONG KONG
12:47   13:47   19:47

474A/3.057 - 3 zones

case size: 904 x 180 x 58mm (35.6" x 7.1" x 2.3")

474A/4.057 - 4 zones

case size: 1204 x 180 x 58mm (47.0" x 7.1" x 2.3")

474A/5.057 - 5 zones

case size: 1504 x 180 x 58mm (59.2" x 7.1" x 2.3")

474A/6.057 - 6 zones

case size: 1804 x 180 x 58mm (71.0" x 7.1" x 2.3")

474A/8.057 - 8 zones

case size: 2408 x 180 x 58mm (94.8" x 7.1" x 2.3")
(case supplied as two off four zone
sections)

display: 57mm (2.3")
visibility: < 25m (75ft)

The **474A/x.057** range of time zone displays
are now available as **474AIL30/x.057** or
474AIL50/x.057 models with illuminated
location legends on every zone.

Each time zone on the **474AIL30/x.057** has
a 30mm high 10 character location legend
display which can be user programmed to
indicate a custom time zone name or
location.

Each time zone on the **474AIL50/x.057** has
a 50mm high 10 character location legend
display which can be user programmed to
indicate a custom time zone name or
location.

case type	time zones	display height	display colour	order reference	display colour	order reference
surface mounting	3	57mm	red green	474A/3.057.R.S 474A/3.057.G.S	yellow blue	474A/3.057.Y.S 474A/3.057.B.S
flush mounting in a panel with rear access	3	57mm	red green	474A/3.057.R.FP 474A/3.057.G.FP	yellow blue	474A/3.057.Y.FP 474A/3.057.B.FP
flush mounting with steel mounting box for solid wall	3	57mm	red green	474A/3.057.R.FB 474A/3.057.G.FB	yellow blue	474A/3.057.Y.FB 474A/3.057.B.FB
single sided with ceiling suspension	3	57mm	red green	474A/3.057.R.SS 474A/3.057.G.SS	yellow blue	474A/3.057.Y.SS 474A/3.057.B.SS
double sided with ceiling suspension	3	57mm	red green	474A/3.057.R.DS 474A/3.057.G.DS	yellow blue	474A/3.057.Y.DS 474A/3.057.B.DS
surface mounting	4	57mm	red green	474A/4.057.R.S 474A/4.057.G.S	yellow blue	474A/4.057.Y.S 474A/4.057.B.S
flush mounting in a panel with rear access	4	57mm	red green	474A/4.057.R.FP 474A/4.057.G.FP	yellow blue	474A/4.057.Y.FP 474A/4.057.B.FP
flush mounting with steel mounting box for solid wall	4	57mm	red green	474A/4.057.R.FB 474A/4.057.G.FB	yellow blue	474A/4.057.Y.FB 474A/4.057.B.FB
single sided with ceiling suspension	4	57mm	red green	474A/4.057.R.SS 474A/4.057.G.SS	yellow blue	474A/4.057.Y.SS 474A/4.057.B.SS
double sided with ceiling suspension	4	57mm	red green	474A/4.057.R.DS 474A/4.057.G.DS	yellow blue	474A/4.057.Y.DS 474A/4.057.B.DS
surface mounting	5	57mm	red green	474A/5.057.R.S 474A/5.057.G.S	yellow blue	474A/5.057.Y.S 474A/5.057.B.S
flush mounting in a panel with rear access	5	57mm	red green	474A/5.057.R.FP 474A/5.057.G.FP	yellow blue	474A/5.057.Y.FP 474A/5.057.B.FP
flush mounting with steel mounting box for solid wall	5	57mm	red green	474A/5.057.R.FB 474A/5.057.G.FB	yellow blue	474A/5.057.Y.FB 474A/5.057.B.FB
single sided with ceiling suspension	5	57mm	red green	474A/5.057.R.SS 474A/5.057.G.SS	yellow blue	474A/5.057.Y.SS 474A/5.057.B.SS
double sided with ceiling suspension	5	57mm	red green	474A/5.057.R.DS 474A/5.057.G.DS	yellow blue	474A/5.057.Y.DS 474A/5.057.B.DS
surface mounting	6	57mm	red green	474A/6.057.R.S 474A/6.057.G.S	yellow blue	474A/6.057.Y.S 474A/6.057.B.S
flush mounting in a panel with rear access	6	57mm	red green	474A/6.057.R.FP 474A/6.057.G.FP	yellow blue	474A/6.057.Y.FP 474A/6.057.B.FP
flush mounting with steel mounting box for solid wall	6	57mm	red green	474A/6.057.R.FB 474A/6.057.G.FB	yellow blue	474A/6.057.Y.FB 474A/6.057.B.FB
single sided with ceiling suspension	6	57mm	red green	474A/6.057.R.SS 474A/6.057.G.SS	yellow blue	474A/6.057.Y.SS 474A/6.057.B.SS
double sided with ceiling suspension	6	57mm	red green	474A/6.057.R.DS 474A/6.057.G.DS	yellow blue	474A/6.057.Y.DS 474A/6.057.B.DS
surface mounting	8	57mm	red green	474A/8.057.R.S 474A/8.057.G.S	yellow blue	474A/8.057.Y.S 474A/8.057.B.S
flush mounting in a panel with rear access	8	57mm	red green	474A/8.057.R.FP 474A/8.057.G.FP	yellow blue	474A/8.057.Y.FP 474A/8.057.B.FP
flush mounting with steel mounting box for solid wall	8	57mm	red green	474A/8.057.R.FB 474A/8.057.G.FB	yellow blue	474A/8.057.Y.FB 474A/8.057.B.FB
single sided with ceiling suspension	8	57mm	red green	474A/8.057.R.SS 474A/8.057.G.SS	yellow blue	474A/8.057.Y.SS 474A/8.057.B.SS
double sided with ceiling suspension	8	57mm	red green	474A/8.057.R.DS 474A/8.057.G.DS	yellow blue	474A/8.057.Y.DS 474A/8.057.B.DS

standard features

customer specified choice of time zone locations
and legend style

pre-programmed automatic seasonal time changes

stand-alone operation or central control via
a TimeLord series master clock. (8 zone
units must be controlled with a master clock)

universal 100 - 250v 50/60hz ac power supply

case colours & finishes		add to order reference
anodised black	- no extra cost	.black
anodised silver	- no extra cost	.silver
painted off white to RAL 9010	- extra cost option	.RAL9010
any RAL or BS colour painted	- extra cost option	.special

WWW.▼TX.CO.UK

case type	time zones	display height	display colour	order reference	display colour	order reference
surface mounting	3	100mm	red green	474A/3.100.R.S 474A/3.100.G.S	yellow blue	474A/3.100.R.S 474A/3.100.G.S
flush mounting in a panel with rear access	3	100mm	red green	474A/3.100.R.FP 474A/3.100.G.FP	yellow blue	474A/3.100.R.FP 474A/3.100.G.FP
flush mounting with a steel box for a solid wall	3	100mm	red green	474A/3.100.R.FB 474A/3.100.G.FB	yellow blue	474A/3.100.R.FB 474A/3.100.G.FB
single sided with ceiling suspension	3	100mm	red green	474A/3.100.R.SS 474A/3.100.G.SS	yellow blue	474A/3.100.R.SS 474A/3.100.G.SS
double sided with ceiling suspension	3	100mm	red green	474A/3.100.R.DS 474A/3.100.G.DS	yellow blue	474A/3.100.R.DS 474A/3.100.G.DS
surface mounting	4	100mm	red green	474A/4.100.R.S 474A/4.100.G.S	yellow blue	474A/4.100.R.S 474A/4.100.G.S
flush mounting in a panel with rear access	4	100mm	red green	474A/4.100.R.FP 474A/4.100.G.FP	yellow blue	474A/4.100.R.FP 474A/4.100.G.FP
flush mounting with a steel box for a solid wall	4	100mm	red green	474A/4.100.R.FB 474A/4.100.G.FB	yellow blue	474A/4.100.R.FB 474A/4.100.G.FB
single sided with ceiling suspension	4	100mm	red green	474A/4.100.R.SS 474A/4.100.G.SS	yellow blue	474A/4.100.R.SS 474A/4.100.G.SS
double sided with ceiling suspension	4	100mm	red green	474A/4.100.R.DS 474A/4.100.G.DS	yellow blue	474A/4.100.R.DS 474A/4.100.G.DS
surface mounting	5	100mm	red green	474A/5.100.R.S 474A/5.100.G.S	yellow blue	474A/5.100.R.S 474A/5.100.G.S
flush mounting in a panel with rear access	5	100mm	red green	474A/5.100.R.FP 474A/5.100.G.FP	yellow blue	474A/5.100.R.FP 474A/5.100.G.FP
flush mounting with a steel box for a solid wall	5	100mm	red green	474A/5.100.R.FB 474A/5.100.G.FB	yellow blue	474A/5.100.R.FB 474A/5.100.G.FB
single sided with ceiling suspension	5	100mm	red green	474A/5.100.R.SS 474A/5.100.G.SS	yellow blue	474A/5.100.R.SS 474A/5.100.G.SS
double sided with ceiling suspension	5	100mm	red green	474A/5.100.R.DS 474A/5.100.G.DS	yellow blue	474A/5.100.R.DS 474A/5.100.G.DS
surface mounting	6	100mm	red green	474A/6.100.R.S 474A/6.100.G.S	yellow blue	474A/6.100.R.S 474A/6.100.G.S
flush mounting in a panel with rear access	6	100mm	red green	474A/6.100.R.FP 474A/6.100.G.FP	yellow blue	474A/6.100.R.FP 474A/6.100.G.FP
flush mounting with a steel box for a solid wall	6	100mm	red green	474A/6.100.R.FB 474A/6.100.G.FB	yellow blue	474A/6.100.R.FB 474A/6.100.G.FB
single sided with ceiling suspension	6	100mm	red green	474A/6.100.R.SS 474A/6.100.G.SS	yellow blue	474A/6.100.R.SS 474A/6.100.G.SS
double sided with ceiling suspension	6	100mm	red green	474A/6.100.R.DS 474A/6.100.G.DS	yellow blue	474A/6.100.R.DS 474A/6.100.G.DS
surface mounting	8	100mm	red green	474A/8.100.R.S 474A/8.100.G.S	yellow blue	474A/8.100.R.S 474A/8.100.G.S
flush mounting in a panel with rear access	8	100mm	red green	474A/8.100.R.FP 474A/8.100.G.FP	yellow blue	474A/8.100.R.FP 474A/8.100.G.FP
flush mounting with a steel box for a solid wall	8	100mm	red green	474A/8.100.R.FB 474A/8.100.G.FB	yellow blue	474A/8.100.R.FB 474A/8.100.G.FB
single sided with ceiling suspension	8	100mm	red green	474A/8.100.R.SS 474A/8.100.G.SS	yellow blue	474A/8.100.R.SS 474A/8.100.G.SS
double sided with ceiling suspension	8	100mm	red green	474A/8.100.R.DS 474A/8.100.G.DS	yellow blue	474A/8.100.R.DS 474A/8.100.G.DS

external synchronisation information	page 25
display mounting information	page 26
accuracy - stand-alone operation	typically < than one second per week from 20-25 °C

474A/3.100 - 3 zones

case size: 1654 x 300 x 58mm (65.1" x 11.8" x 2.3")

474A/4.100 - 4 zones

case size: 2204 x 300 x 58mm (86.8" x 11.8" x 2.3")

474A/5.100 - 5 zones

case size: 2758 x 300 x 58mm (108.6" x 11.8" x 2.3") (supplied as one off two zone & one off three zone sections)

474A/6.100 - 6 zones

case size: 3308 x 300 x 58mm (130.2" x 11.8" x 2.3") (supplied as two off three zone sections)

474A/8.100 - 8 zones

case size: 4412 x 300 x 58mm (173.7" x 11.8" x 2.3") (supplied as one off two zone & two off three zone sections)

display: 100mm (4")
visibility: < 45m (150ft)

The **474A/x.100** range of time zone displays are now available as **474AIL50/x.100** models with illuminated location legends on every zone.

Each time zone on the **474AIL50/x.100** has a 50mm high 10 character location legend display which can be user programmed to indicate a custom time zone name or location.

options

special case colours and finishes

removable zone identification plates

'seconds' display for one or all time zones

calendar information at one end or centre of display (474A/x.12 only)

type 408 remote control handset - page 7

time synchronisation by GPS time signal receivers - page 7

time synchronisation from UTC referenced IRIG-B or afnor NFS 87 500 time code

centralised control using TimeLord series master clocks - pages 21 - 23

10Base-T Ethernet option to enable centralised control from NTP Ethernet time server - see page 25

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474A/3.12 - 3 zones

case size: 1804 x 300 x 58mm (71.0" x 11.8" x 2.3")

474A/4.12 - 4 zones

case size: 2408 x 300 x 58mm (94.8" x 11.8" x 2.3")
(supplied as two off two zone sections)

474A/5.12 - 5 zones

case size: 3008 x 300 x 58mm (118.4" x 11.8" x 2.3")
(supplied as one off two zone & one off
three zone sections)

474A/6.12 - 6 zones

case size: 3608 x 300 x 58mm (142.0" x 11.8" x 2.3")
(supplied as two off three zone sections)

474A/8.12 - 8 zones

case size: 4812 x 300 x 58mm (189.4" x 11.8" x 2.3")
(supplied as one off two zone & two off
three zone sections)

display: 120mm (4.7")
visibility: < 60m (200ft)

The **474A/x.12** range of time zone displays
are now available as **474AIL50/x.12** models
with illuminated location legends on every
zone.

Each time zone on the **474AIL50/x.12** has a
50mm high 10 character location legend
display which can be user programmed to
indicate a custom time zone name or
location.

case type	time zones	display height	display colour	order reference
surface mounting	3	120mm	red	474A/3.12.R.S
			green	474A/3.12.G.S
flush mounting in a panel with rear access	3	120mm	red	474A/3.12.R.FP
			green	474A/3.12.G.FP
flush mounting with steel mounting box for solid wall	3	120mm	red	474A/3.12.R.FB
			green	474A/3.12.G.FB
single sided with ceiling suspension	3	120mm	red	474A/3.12.R.SS
			green	474A/3.12.G.SS
double sided with ceiling suspension	3	120mm	red	474A/3.12.R.DS
			green	474A/3.12.G.DS
surface mounting	4	120mm	red	474A/4.12.R.S
			green	474A/4.12.G.S
flush mounting in a panel with rear access	4	120mm	red	474A/4.12.R.FP
			green	474A/4.12.G.FP
flush mounting with steel mounting box for solid wall	4	120mm	red	474A/4.12.R.FB
			green	474A/4.12.G.FB
single sided with ceiling suspension	4	120mm	red	474A/4.12.R.SS
			green	474A/4.12.G.SS
double sided with ceiling suspension	4	120mm	red	474A/4.12.R.DS
			green	474A/4.12.G.DS
surface mounting	5	120mm	red	474A/5.12.R.S
			green	474A/5.12.G.S
flush mounting in a panel with rear access	5	120mm	red	474A/5.12.R.FP
			green	474A/5.12.G.FP
flush mounting with steel mounting box for solid wall	5	120mm	red	474A/5.12.R.FB
			green	474A/5.12.G.FB
single sided with ceiling suspension	5	120mm	red	474A/5.12.R.SS
			green	474A/5.12.G.SS
double sided with ceiling suspension	5	120mm	red	474A/5.12.R.DS
			green	474A/5.12.G.DS
surface mounting	6	120mm	red	474A/6.12.R.S
			green	474A/6.12.G.S
flush mounting in a panel with rear access	6	120mm	red	474A/6.12.R.FP
			green	474A/6.12.G.FP
flush mounting with steel mounting box for solid wall	6	120mm	red	474A/6.12.R.FB
			green	474A/6.12.G.FB
single sided with ceiling suspension	6	120mm	red	474A/6.12.R.SS
			green	474A/6.12.G.SS
double sided with ceiling suspension	6	120mm	red	474A/6.12.R.DS
			green	474A/6.12.G.DS
surface mounting	8	120mm	red	474A/8.12.R.S
			green	474A/8.12.G.S
flush mounting in a panel with rear access	8	120mm	red	474A/8.12.R.FP
			green	474A/8.12.G.FP
flush mounting with steel mounting box for solid wall	8	120mm	red	474A/8.12.R.FB
			green	474A/8.12.G.FB
single sided with ceiling suspension	8	120mm	red	474A/8.12.R.SS
			green	474A/8.12.G.SS
double sided with ceiling suspension	8	120mm	red	474A/8.12.R.DS
			green	474A/8.12.G.DS

standard features

customer specified choice of time zone locations
and legend style

pre-programmed automatic seasonal time changes

stand-alone operation or central control via
a TimeLord series master clock. (8 zone
units must be controlled with a master clock)

universal 100 - 250v 50/60hz ac power supply

case colours & finishes		add to order reference
anodised black	- no extra cost	.black
anodised silver	- no extra cost	.silver
painted off white to RAL 9010	- extra cost option	.RAL9010
any RAL or BS colour painted	- extra cost option	.special

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case type	time zones	display height	display colour	order reference	display colour	order reference
surface mounting	3	50mm	red green	475A/3.05.R.S 475A/3.05.G.S	yellow blue	475A/3.05.Y.S 475A/3.05.B.S
flush mounting in a panel with rear access	3	50mm	red green	475A/3.05.R.FP 475A/3.05.G.FP	yellow blue	475A/3.05.Y.FP 475A/3.05.B.FP
flush mounting with steel mounting box for solid wall	3	50mm	red green	475A/3.05.R.FB 475A/3.05.G.FB	yellow blue	475A/3.05.Y.FB 475A/3.05.B.FB
single sided with ceiling suspension	3	50mm	red green	475A/3.05.R.SS 475A/3.05.G.SS	yellow blue	475A/3.05.Y.SS 475A/3.05.B.SS
double sided with ceiling suspension	3	50mm	red green	475A/3.05.R.DS 475A/3.05.G.DS	yellow blue	475A/3.05.Y.DS 475A/3.05.B.DS
surface mounting	4	50mm	red green	475A/4.05.R.S 475A/4.05.G.S	yellow blue	475A/4.05.Y.S 475A/4.05.B.S
flush mounting in a panel with rear access	4	50mm	red green	475A/4.05.R.FP 475A/4.05.G.FP	yellow blue	475A/4.05.Y.FP 475A/4.05.B.FP
flush mounting with steel mounting box for solid wall	4	50mm	red green	475A/4.05.R.FB 475A/4.05.G.FB	yellow blue	475A/4.05.Y.FB 475A/4.05.B.FB
single sided with ceiling suspension	4	50mm	red green	475A/4.05.R.SS 475A/4.05.G.SS	yellow blue	475A/4.05.Y.SS 475A/4.05.B.SS
double sided with ceiling suspension.	4	50mm	red green	475A/4.05.R.DS 475A/4.05.G.DS	yellow blue	475A/4.05.Y.DS 475A/4.05.B.DS
surface mounting	5	50mm	red green	475A/5.05.R.S 475A/5.05.G.S	yellow blue	475A/5.05.Y.S 475A/5.05.B.S
flush mounting in a panel with rear access	5	50mm	red green	475A/5.05.R.FP 475A/5.05.G.FP	yellow blue	475A/5.05.Y.FP 475A/5.05.B.FP
flush mounting with steel mounting box for solid wall	5	50mm	red green	475A/5.05.R.FB 475A/5.05.G.FB	yellow blue	475A/5.05.Y.FB 475A/5.05.B.FB
single sided with ceiling suspension	5	50mm	red green	475A/5.05.R.SS 475A/5.05.G.SS	yellow blue	475A/5.05.Y.SS 475A/5.05.B.SS
double sided with ceiling suspension	5	50mm	red green	475A/5.05.R.DS 475A/5.05.G.DS	yellow blue	475A/5.05.Y.DS 475A/5.05.B.DS
surface mounting	6	50mm	red green	475A/6.05.R.S 475A/6.05.G.S	yellow blue	475A/6.05.Y.S 475A/6.05.B.S
flush mounting in a panel with rear access	6	50mm	red green	475A/6.05.R.FP 475A/6.05.G.FP	yellow blue	475A/6.05.Y.FP 475A/6.05.B.FP
flush mounting with steel mounting box for solid wall	6	50mm	red green	475A/6.05.R.FB 475A/6.05.G.FB	yellow blue	475A/6.05.Y.FB 475A/6.05.B.FB
single sided with ceiling suspension	6	50mm	red green	475A/6.05.R.SS 475A/6.05.G.SS	yellow blue	475A/6.05.Y.SS 475A/6.05.B.SS
double sided with ceiling suspension	6	50mm	red green	475A/6.05.R.DS 475A/6.05.G.DS	yellow blue	475A/6.05.Y.DS 475A/6.05.B.DS
surface mounting	8	50mm	red green	475A/8.05.R.S 475A/8.05.G.S	yellow blue	475A/8.05.Y.S 475A/8.05.B.S
flush mounting in a panel with rear access	8	50mm	red green	475A/8.05.R.FP 475A/8.05.G.FP	yellow blue	475A/8.05.Y.FP 475A/8.05.B.FP
flush mounting with steel mounting box for solid wall	8	50mm	red green	475A/8.05.R.FB 475A/8.05.G.FB	yellow blue	475A/8.05.Y.FB 475A/8.05.B.FB
single sided with ceiling suspension	8	50mm	red green	475A/8.05.R.SS 475A/8.05.G.SS	yellow blue	475A/8.05.Y.SS 475A/8.05.B.SS
double sided with ceiling suspension	8	50mm	red green	475A/8.05.R.DS 475A/8.05.G.DS	yellow blue	475A/8.05.Y.DS 475A/8.05.B.DS

external synchronisation information	page 25
display mounting information	page 26
accuracy - stand-alone operation	typically < than one second per week from 20-25 °C

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New York 07:47   **London** 12:47   **Paris** 13:47

475A/3.05 - 3 zones
case size: 904 x 300 x 58mm (35.6" x 11.8" x 2.3")

475A/4.05 - 4 zones
case size: 1204 x 300 x 58mm (47.0" x 11.8" x 2.3")

475A/5.05 - 5 zones
case size: 1504 x 300 x 58mm (59.2" x 11.8" x 2.3")

475A/6.05 - 6 zones
case size: 1804 x 300 x 58mm (71.0" x 11.8" x 2.3")

475A/8.05 - 8 zones
case size: 2408 x 300 x 58mm (94.8" x 11.8" x 2.3") (supplied as one off four zone and two off two zone sections)

display: 50mm (2")
visibility: < 25m (75ft)

The **475A/x.05** range of time zone displays are now available as **475AIL30/x.05** or **475AIL50/x.05** models with illuminated location legends on every zone.

Each time zone on the **475AIL30/x.05** has a 30mm high 10 character location legend display which can be user programmed to indicate a custom time zone name or location.

Each time zone on the **475AIL50/x.05** has a 50mm high 10 character location legend display which can be user programmed to indicate a custom time zone name or location.

options

special case colours and finishes

removable zone identification plates

'seconds' display for one or all time zones

type 408 remote control handset - page 7

time synchronisation by GPS time signal receivers - page 7

time synchronisation from UTC referenced IRIG-B or afnor NFS 87 500 time code

centralised control using TimeLord series master clocks - pages 21 - 23

10Base-T Ethernet option to enable centralised control from NTP Ethernet time server - see page 25

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479A/3.05 - 479A/8.05 time zone displays with analogue seconds
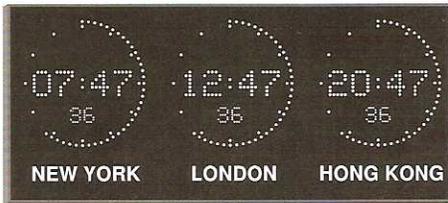
479A/3.05 - 3 zones

case size: 904 x 400 x 58mm (35.6" x 15.7" x 2.3")

479A/4.05 - 4 zones

case size: 1204 x 400 x 58mm (47.4" x 15.7" x 2.3")

479A/5.05 - 5 zones

case size: 1504 x 400 x 58mm (59.2" x 15.7" x 2.3")

479A/6.05 - 6 zones

case size: 1804 x 400 x 58mm (71.0" x 15.7" x 2.3")

479A/8.05 - 8 zones

case size: 2408 x 400 x 58mm (94.8" x 15.7" x 2.3")
(supplied as two off four zone sections)

display: 50 & 30mm (2" & 1.2")
visibility: < 20m (60ft)

The **479A/x.05** range of time zone displays are now available as **479AIL30/x.05** or **479AIL50/x.05** models with illuminated location legends on every zone.

Each time zone on the **479AIL30/x.05** has a 30mm high 10 character location legend display which can be user programmed to indicate a custom time zone name or location.

Each time zone on the **479AIL50/x.05** has a 50mm high 10 character location legend display which can be user programmed to indicate a custom time zone name or location.

standard features

customer specified choice of time zone locations and legend style

pre-programmed automatic seasonal time changes

black anodised or painted case finish

stand-alone operation or central control via a TimeLord series master clock. (8 zone units must be controlled with a master clock)

universal 100 - 250v 50/60hz ac power supply

options

type 408 remote control handset - page 7

removable zone identification plates

time synchronisation by GPS, DCF & MSF radio time code receivers - page 7

time synchronisation from UTC referenced IRIG-B or afnor NFS 87 500 time code

centralised control using TimeLord series master clocks - pages 21 - 23

10Base-T Ethernet option to enable centralised control from NTP Ethernet time server - see page 25

case type	time zones	display heights	display colour	order reference	display colour	order reference
surface mounting	3	50 & 30mm	red green	479A/3.05.R.S 479A/3.05.G.S	blue	479A/3.05.B.S
flush mounting in a panel with rear access	3	50 & 30mm	red green	479A/3.05.R.FP 479A/3.05.G.FP	blue	479A/3.05.B.FP
flush mounting with steel mounting box for solid wall	3	50 & 30mm	red green	479A/3.05.R.FB 479A/3.05.G.FB	blue	479A/3.05.B.FB
single sided with ceiling suspension	3	50 & 30mm	red green	479A/3.05.R.SS 479A/3.05.G.SS	blue	479A/3.05.B.SS
double sided with ceiling suspension	3	50 & 30mm	red green	479A/3.05.R.DS 479A/3.05.G.DS	blue	479A/3.05.B.DS
surface mounting	4	50 & 30mm	red green	479A/4.05.R.S 479A/4.05.G.S	blue	479A/4.05.B.S
flush mounting in a panel with rear access	4	50 & 30mm	red green	479A/4.05.R.FP 479A/4.05.G.FP	blue	479A/4.05.B.FP
flush mounting with steel mounting box for solid wall	4	50 & 30mm	red green	479A/4.05.R.FB 479A/4.05.G.FB	blue	479A/4.05.B.FB
single sided with ceiling suspension	4	50 & 30mm	red green	479A/4.05.R.SS 479A/4.05.G.SS	blue	479A/4.05.B.SS
double sided with ceiling suspension.	4	50 & 30mm	red green	479A/4.05.R.DS 479A/4.05.G.DS	blue	479A/4.05.B.DS
surface mounting	5	50 & 30mm	red green	479A/5.05.R.S 479A/5.05.G.S	blue	479A/5.05.B.S
flush mounting in a panel with rear access	5	50 & 30mm	red green	479A/5.05.R.FP 479A/5.05.G.FP	blue	479A/5.05.B.FP
flush mounting with steel mounting box for solid wall	5	50 & 30mm	red green	479A/5.05.R.FB 479A/5.05.G.FB	blue	479A/5.05.B.FB
single sided with ceiling suspension	5	50 & 30mm	red green	479A/5.05.R.SS 479A/5.05.G.SS	blue	479A/5.05.B.SS
double sided with ceiling suspension	5	50 & 30mm	red green	479A/5.05.R.DS 479A/5.05.G.DS	blue	479A/5.05.B.DS
surface mounting	6	50 & 30mm	red green	479A/6.05.R.S 479A/6.05.G.S	blue	479A/6.05.B.S
flush mounting in a panel with rear access	6	50 & 30mm	red green	479A/6.05.R.FP 479A/6.05.G.FP	blue	479A/6.05.B.FP
flush mounting with steel mounting box for solid wall	6	50 & 30mm	red green	479A/6.05.R.FB 479A/6.05.G.FB	blue	479A/6.05.B.FB
single sided with ceiling suspension	6	50 & 30mm	red green	479A/6.05.R.SS 479A/6.05.G.SS	blue	479A/6.05.B.SS
double sided with ceiling suspension	6	50 & 30mm	red green	479A/6.05.R.DS 479A/6.05.G.DS	blue	479A/6.05.B.DS
surface mounting	8	50 & 30mm	red green	479A/8.05.R.S 479A/8.05.G.S	blue	479A/8.05.B.S
flush mounting in a panel with rear access	8	50 & 30mm	red green	479A/8.05.R.FP 479A/8.05.G.FP	blue	479A/8.05.B.FP
flush mounting with steel mounting box for solid wall	8	50 & 30mm	red green	479A/8.05.R.FB 479A/8.05.G.FB	blue	479A/8.05.B.FB
single sided with ceiling suspension	8	50 & 30mm	red green	479A/8.05.R.SS 479A/8.05.G.SS	blue	479A/8.05.B.SS
double sided with ceiling suspension	8	50 & 30mm	red green	479A/8.05.R.DS 479A/8.05.G.DS	blue	479A/8.05.B.DS

case colours & finishes		add to order reference
anodised black	- no extra cost	.black
anodised silver	- no extra cost	.silver
painted off white to RAL 9010	- extra cost option	.RAL9010
any RAL or BS colour painted	- extra cost option	.special

The TimeLord Atomic-locked Master Time Source provides everything required for accurate timekeeping within a broadcast and professional AV environment. It solves the difficult problem of generating accurate video-referenced EBU and SMPTE timecode that can be used in the video domain, generating both LTC and VITC Longitudinal and Vertical interval timecodes with video character insertion.

TimeLord-MTG rack mounting master clock

EBU / SMPTE timecode outputs

Both balanced LTC Longitudinal Timecode and VITC Vertical Interval timecode are produced plus an on-board character generator allows accurate time / date video insertion with ident message if required. Up to 9 lines of 20 characters are possible with multiple ident messages, each of which may be individually positioned on the screen. These can be inserted together with time / timecode, date and use-bit information. The font size is also adjustable. There is a strict relationship between the time data within the timecode signal and the various 4-field and 8-field sequences in the video signal and unless timecode conforms to this relationship exactly, Broadcast servers and editing systems.

The TimeLord video input should be fed with a suitable reference signal, ideally station Black and Burst from the Master SPG Sync Pulse Generator. This signal is used to reference the generated EBU or SMPTE timecode outputs to the video signal, adjusting the timecode to meet EBU and SMPTE specifications.

software setup program is provided to download setup and ident message information to the TimeLord, including the selection of VITC lines which may also lie outside field blanking. This is particularly useful for modern VTRs which do not preserve the VBI Vertical Blanking Interval.

The TimeLord lets customers use their existing SPG sync pulse generator and yet provides accurate time-of-day timecode generated, locked to both an atomic reference and to video.

The PAL video signal follows an 8-field sequence (4-frames) whilst the NTSC sequence consists of 4-fields (2-frames) which then repeats. It is possible to deduce from the time bits in each timecode number, the type of video frame to which it refers (1,2,3,4 in PAL-SECAM / 1,2 in NTSC). Counting starts from frame 00:00:00:01 which is a video frame-1 The sync word in the timecode data mustalso occur within 1 bit of vertical sync - that is within 1/80th of a frame - so that one frame of timecode refers precisely to one frame of video.

When locked to an off-air reference such as GPS, the atomic clock provides absolute time information to the TimeLord. Unless the station SPG happens to be producing the correct frame of video at that time and that the vertical interval happens to line up with the sync word the timecode outut has limited use for video applications. Station automation systems and editing controllers are often upset by discontinuities and ambiguities in timecode data which is why correct video locking is essential.

SMPTE/EBU outputs

There are of course ways to lock the SPG oscillator to the same time / frequency source (GPS for example) and Vortex has high stability disciplined oscillators available for this if required. These include very long phase-locked loops to ensure that no jitter from the off-air signal is passed onto the SPG video output as can occur in some cases. Even with an externally-locked oscillator, however, the relationship between the vertical interval and timecode is unlikely to be correct and a discontinuity will still occur if there happens to be "leap second" which introduces a 1-second jump in time which does not correspond to a whole number of video frames.
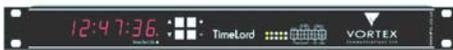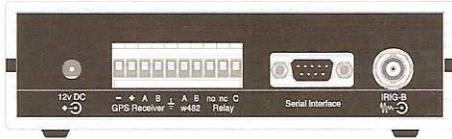
How the TimeLord works

The TimeLord always generates EBU/SMPTE timecode locked to reference video. The time information from the atomic source is adjusted to the nearest correct value to ensure that that the timecode output matches the SPG reference. The timecode output, which is referenced to external video, will drift compared to the off-air reference over time. Once this becomes more than 3 frames the TimeLord recognizes the offset and allows the timecode output to re-synchronize to the atomic reference but at a pre-determined time - 3am for example - downloaded to the TimeLord from using setup program. Of course, daylight savings changes occur immediately. If the SPG happens to be locked to the same off-air reference (eg GPS), this drift will not occur and the TimeLord will not have to re-adjust the timecode output except when leap seconds occur. Even with a free-running broadcast Master SPG such as the Vortex SPG-100SP or SPG-100XP which have ovened oscillators, this drift will be very slow and resynchronization will only need to occur after a number of days or even weeks.

timelord

TimeLord T series table top or free standing master clock

TimeLord R series rack mounting master clock

The TimeLord-lite/T desktop master clock provides a complete precision time synchronisation solution for computer networks, CCTV security, C^3, digital clock systems, industrial process control, voice recording and many other applications requiring accurate time synchronisation of equipment.

The following data outputs are provided as standard:

> RS232 and RS422/RS485 outputs which can transmit one of more than 36 different serial ASCII time and date telegrams at user selected formats and intervals. A wide range of application specific time and date message formats, with pre-programmed parameters where applicable, provide a simple 'set and forget' capability to enable the precision synchronisation of many different types of video recording, computer and communications equipment.

> An RS232 level precision 1pps 'on-time' signal.

> A programmable changeover relay contact pair providing periodic signals or status information.

> A w482® time code output which can control up to fifty 400A series digital clocks or time zone displays showing time and date in up to 15 different world-wide time zones with pre-programmed seasonal time changes.

An optional 600Ω, 1Khz modulated multi-format IRIG code output or an EBU time code output may be specified at time of order.

The TimeLord-lite/T master clock may be used in stand-alone mode, deriving its time keeping from its accurate, high stability, internal crystal oscillator or, for ultimate precision, synchronised via optional receivers to GPS satellite transmitters or DCF and MSF terrestrial radio time code transmitters.

The TimeLord T master clock is housed in a small free standing case and is also available as the TimeLord R model housed in a 1U high case and suitable for 19" rack mounting applications.

software

The TimeLord Time Source is supplied with *Free* Win NT4 (x86) and Win 9x synchronisation software and has a serial output format compatible with the standard NTP distribution. *(www.ntp.org)*

power supply

.T. versions are supplied with an external 'plug-top' type power supply unit.

.R. versions, housed in 19" rack mounting cases are fitted with an internal 100-250v 50/60Hz ac power supply.

Both versions may also be powered from an existing 12v dc 200mA power source.

The required operating voltage and connector type must be specified by placing the appropriate country code at the end the the part number in place of *.psu*

.AU - Australian style, 240v 50Hz ac.
.EU - European style, 230v 50Hz ac.
.UK - UK style, 230v 50Hz ac.
.US - US style, 110v 60Hz ac

TimeLord-lite rack mount master clocks provide a complete time reference solution for both simple and complex systems with outputs compatible with computer networks, CCTV security systems, process control, voice recording and C³ in addition to the traditional role of controlling slave clocks.

The following data outputs are provided as standard:

> The TimeLord-net master clock is fitted with a 10Base-T Ethernet interface to allow it to act as a NTP time server on a TCP/IP network (TimeLord-net only.)

> A single RS232 and RS422/RS485 output which can transmit one of more than 36 different serial ASCII time and date telegrams at user selected formats and intervals. A wide range of application specific time and date message formats, with pre-programmed parameters, provide a simple 'set and forget' capability to enable the precision synchronisation of many different types of video recording, computer and communications equipment. Up to three additional multi-format serial outputs are available as an extra cost option.

> An RS232 level precision 1pps 'on-time' signal.

> A programmable changeover relay contact pair providing periodic signals or status information.

> A w482® time code output which can control up to fifty 400A series digital clocks or time zone displays showing time and date in up to 15 different world-wide time zones with pre-programmed seasonal time changes.

An optional 600Ω, 1Khz modulated multi-format IRIG code output or an EBU time code output may be specified at time of order.

The TimeLord-net master clock may be used in stand-alone mode, deriving its time keeping from its temperature compensated internal crystal oscillator (TCXO) or, for ultimate precision, synchronised via optional receivers to GPS satellite transmitters or DCF and MSF terrestrial radio time code transmitters.

The TimeLord-net master clock is housed in a 1U high case and suitable for free standing or 19" rack mounting applications.

TimeLord rack mounting master clock

supported protocols

TimeLord-net supports the following protocols via its 10Base-T Ethernet interface:

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

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

TIME protocol (RFC868) is supported in UDP mode

SNMP - Simple Network Management Protocol is supported allowing remote management of the 4860*net* master clock. (available during 2002)

software

The TimeLord-net is supplied with a 25 user licence for Win NT4 (x86) and Win 9x time synchronisation software

Basic TimeLord units are supplied with serial time synchronisation software to synchronise a single Win NT4 (x86) and Win 9x pc

power supply

Universal 100-250v 50/60Hz ac power supply. The required operating voltage and connector type must be specified by placing the appropriate country code at the end the the part number in place of *.psu*

.AU - Australian style, 240v 50Hz ac.
.EU - European style, 230v 50Hz ac.
.UK - UK style, 230v 50Hz ac.
.US - US style, 110v 60Hz ac

49.85 Hz — FREQUENCY
12:47:36 — STANDARD TIME
-0:52 — TIME DIFFERENCE
12:46:44 — FREQUENCY TIME

601.057

case size: 1470 x 130 x 58mm (57.9" x 5.1" x 2.3")
visibility: < 25m (75ft)

601.100

case size: 2600 x 230 x 58mm (102.4" x 9.1" x 2.3")
visibility: < 50m (150ft)

12:47:36 — Standard Time
12:44:52 — Frequency Time
59.76 Hz — Frequency
- 2:446 — Time Difference

610.02

case size: 240 x 130 x 58mm (9.5" x 5.1" x 2.3")
visibility: < 10m (30ft)

The 601 and 610 frequency control clock systems are designed to provide an integrated display of time and frequency information for power generation control rooms and facilities.

Each display unit uses bright red, green, yellow or blue LED characters to provide an accurate read-out of the supply Frequency, the Standard Time derived from the internal or external time reference, the Frequency Time derived from the 50 or 60Hz supply frequency and the Time Difference between the Standard Time and the Frequency Time.

The display of Frequency and the Frequency Time count are derived from a dedicated, isolated voltage input. The Frequency display has an accuracy of:

$$\pm 0.001\% \pm 1 \text{ digit from 20-80Hz}$$

Both units have an internal, temperature compensated, quartz crystal oscillator that provide a typical initial accuracy of better than 0.1 seconds per day.

An optional 488BGPS satellite time synchronisation sub-system may be fitted to maintain the time keeping within 1mS of UTC.

Each unit can also be synchronised to the w482 code output of a · TimeLord series master clock or to MOBALine time code. IRIG-B or afnor NFS 827 500 time synchronisation is also available as an extra cost option.

A serial RS232 + RS485 data port is provided which allows the master/slave operation of multiple units or the display of information derived by a remote intelligent time /frequency computer with an appropriate serial data output.

Units are fitted with a universal 100-250v 50/60Hz power supply and may also be supplied, at additional cost, for operation from a 24 or 48v dc supply.

case type	display height	display colour	order reference	display colour	order reference
surface mounting with multi-angle mounting brackets	57mm	red green	601.057.R.S 601.057.G.S	yellow blue	601.057.Y.S 601.057.B.S
flush mounting in a panel with rear access	57mm	red green	601.057.R.FP 601.057.G.FP	yellow blue	601.057.Y.FP 601.057.B.FP
single sided with ceiling suspension	57mm	red green	601.057.R.SS 601.057.G.SS	yellow blue	601.057.Y.SS 601.057.B.SS
surface mounting with multi-angle mounting brackets	100mm	red green	601.100.R.S 601.100.G.S	yellow blue	601.100.Y.S 601.100.B.S
flush mounting in a panel with rear access	100mm	red green	601.100.R.FP 601.100.G.FP	yellow blue	601.100.Y.FP 601.100.B.FP
single sided with ceiling suspension	100mm	red green	601.100.R.SS 601.100.G.SS	yellow blue	601.100.Y.SS 601.100.B.SS
surface mounting with multi-angle mounting brackets	20mm	red green	610.020.R.S 610.020.G.S	yellow blue	610.020.Y.S 610.020.B.S
flush mounting in a panel with rear access	20mm	red green	610.020.R.FP 610.020.G.FP	yellow blue	610.020.Y.FP 610.020.B.FP

WWW.▼TX.CO.UK

External Synchronisation

400A series clocks may be synchronised from a range of sources, including radio and satellite time signals and various time codes and impulse signals.

Please note that every externally synchronised 400A clock requires a power supply connection in addition to the data connection.

Alternate and Single Polarity Impulses

Conventional analogue slave clocks are usually controlled by a master clock by means of 24v alternate polarity impulses. The impulses may be transmitted every second, half minute or minute. Impulses are either stopped or increased in rate to effect seasonal or other time corrections. The slave clocks are connected in parallel across the signal cable from the master clock. 400A clocks may be synchronised by 1sec., ½ min. or 1min. 6-48v single or alternate polarity impulses.

Time code synchronisation

The principle advantage of using a time code rather than an impulse signal for synchronising slave clocks is that the use of time code enables a self-setting of the clock on installation, following failures of the mains power supply and in the event of system maintenance. Seasonal time changes normally take place within a few seconds, rather than at the delayed rate typical of an impulse system. The slave clocks will not, in normal circumstances, show an incorrect time.

w482® timecode

The w482® signal was developed for controlling electronic clocks, providing time and date information in any of fifteen different synchronised time zones, using a single cable pair parallel data interconnection, in electrically noisy environments. principal advantage of w482® time code is the ability to provide time information in any one of fifteen different synchronised time zones.

The w482® signal is transmitted at 4-24v amplitude at a 50bps data rate. Typically up to 50 slave clocks can be controlled by a single unbuffered TimeLord master clock output at a distances of over 1km.

A 400A series clock, fitted with a 404.M local master module, may be used as a master clock in a small clock system. Up to ten other 400A series clocks may be controlled as slaves, displaying time, or date and time, in a single time zone at distances of up to 200m.

EBU/SMPTE time code

EBU/SMPTE time code is used in broadcast applications for 'stamping' time information on recordings and for the control of clocks and other intelligent systems. The EBU standard defines the format for hours, minutes and seconds information. Date information can be added to the signal in a number of formats within 'user bit' areas. 400A series clocks, fitted with the 404.E internal interface module, may be programmed to decode the two most popular date formats for either EBU or SMPTE code transmitted within ± 20% of the standard speed.

IRIG-B/AFNOR NFS 87 500

IRIG-B is one of a series of time codes originally developed in the 1940s by the International Range Instrumentation Group (IRIG) for recording time information on magnetic tape and wire for rocket test range instrumentation purposes.

AFNOR NFS 87 500 time code is a development of IRIG-B that is widely used in Europe and contains additional date information. All 400A clocks and calendar clocks, when fitted with the optional 404.I internal interface module, may be synchronised with either a 1KHz amplitude modulated IRIG-B or AFNOR NFS 87 500 time code.

MOBAline®

MOBAline®is a two-wire data transmission system designed for low-speed, highly reliable data transmission and slave equipment control using a frequency modulated 50Hz sine wave signal.

MOBAline® is a registered trade mark of MOSER-BAER AG, wBus® and w482® are registered trade marks

Radio Time Code Synchronisation

All 400A series clocks can be programmed to synchronise to radio time code signals from DCF or MSF when connected to the appropriate 484 series receiver. The clock may be programmed to display BST (MSF synchronised), CET (DCF synchronised) or UTC (GMT) from either MSF or DCF

The DCF signal is transmitted at 77.5KHz and is derived from an atomic clock at the Physics Institute of Brunswick. The MSF signal is transmitted at 60KHz and is referenced to the Caesium Beam Oscillators at the National Physical Laboratory.

Under normal circumstances the DCF signal provides reliable operation at distances of up to 1500km. MSF signals are normally usable up to 1000km. Greater operating ranges are possible at night. However, both signals are subject to increasing levels of electrical noise from computers, communications systems and other type of electronic equipment particularly in urban areas and reception cannot be guaranteed even within the normal operating area.

The received and decoded signal has an operating accuracy of better than ±20mS and provides completely automatic seasonal time changes. During periods of signal failure or signal corruption the clock will maintain accurate time keeping using its internal high stability quartz crystal oscillator.

The signal output from a 484 series receiver may be used to synchronise a master clock system or directly control a 400A series clock. Up to ten further 400A series clocks may be controlled by the clock to which the 484 series receiver is connected using a simple single cable pair interconnection. The first clock should be fitted with a 404.M local master wBus interface module.

GPS Satellite Time Synchronisation

400A series clocks, when used with the 488GPS time synchronisation subsystem, can be synchronised to the time signals from the 21 satellites forming the GPS navigation network. The GPS satellites transmit highly accurate, real time, world-wide navigation information at a frequency of 1575.42MHz.

The 488GPS & 488BGPS time synchronisation subsystems comprise an active antenna, receiver/decoder unit and interconnecting cables. The receiver decoder unit provides a UTC based w482® time code output which can be used to synchronise a master clock system or up to ten individual 400A series clocks. 400A series clocks and calendar clocks synchronised by GPS signals are accurate to within ±5mS at any point on the surface of the earth. The 488GPS system is designed for simple installation and operation.

Please request a 488GPS system data sheet for further information.

## NTP Ethernet time synchronisation

The need for precision time synchronisation across computer networks is becoming ever more widespread for applications which include , authentication systems, cryptographic systems, billing and reservation systems, data collection, financial markets and multiple user shared file systems.

The Network Time Protocol (NTP), developed by researchers at the University of Delaware, is designed to provide time synchronisation to groups of computers across a LAN, WAN or even Internet environments.

NTP uses the UDP protocol to communicate between clients and servers. The client requests the time from the server at regular intervals, calculates the round trip delay correction and controls its own internal clock accordingly.
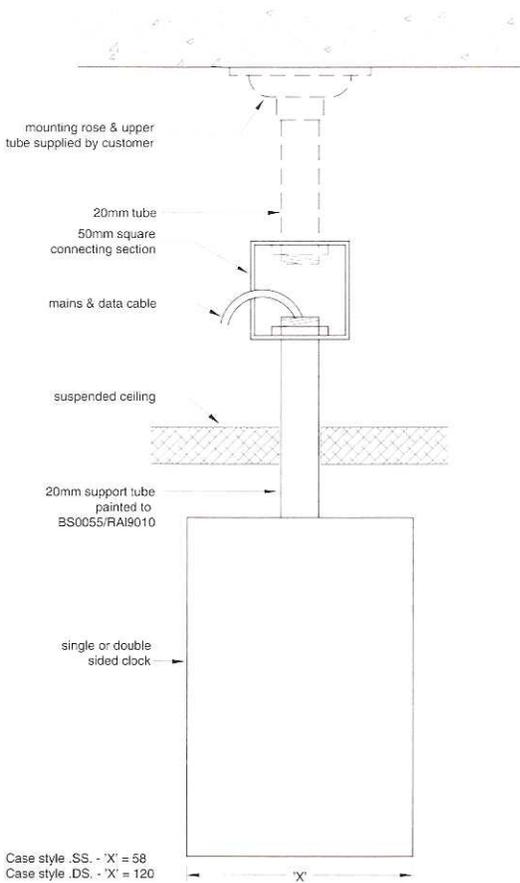
Most internal computer clocks do not provide sufficient accuracy or traceable time synchronisation for such mission critical applications and the TimeLord-net time server provides a cost effective external time reference solution for most applications.
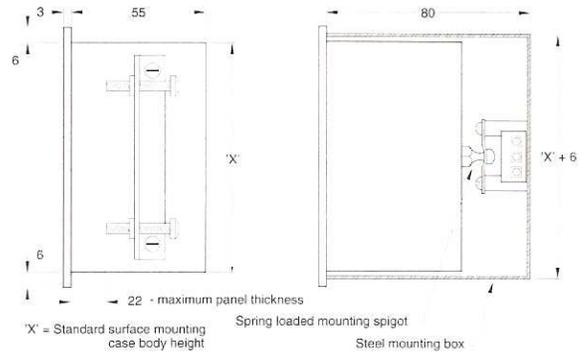
clock mounting information

installation position
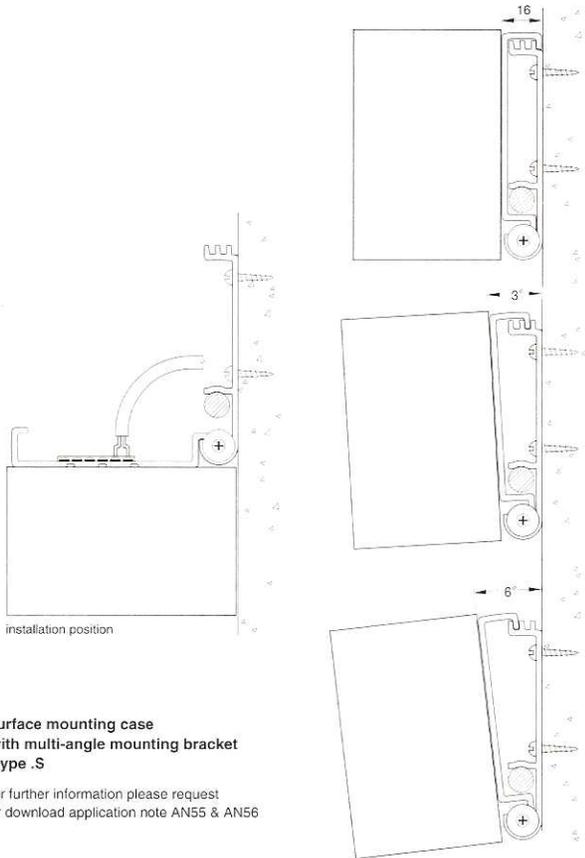
**surface mounting case
with multi-angle mounting bracket
- type .S**

for further information please request
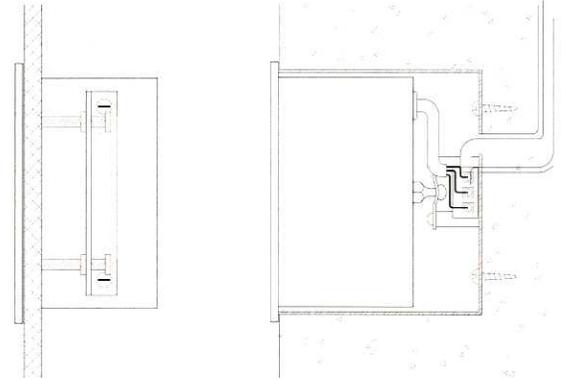or download application note AN55 & AN56

22 - maximum panel thickness

'X' = Standard surface mounting
case body height

Spring loaded mounting spigot

Steel mounting box

**flush fitting case for
mounting in a panel - type .FP**

**flush fitting case with mounting box
for mounting in a solid wall - type .FB**

for further information please request or download application note AN53 & AN54

mounting rose & upper
tube supplied by customer

20mm tube

50mm square
connecting section

mains & data cable

suspended ceiling

20mm support tube
painted to
BS0055/RAl9010

single or double
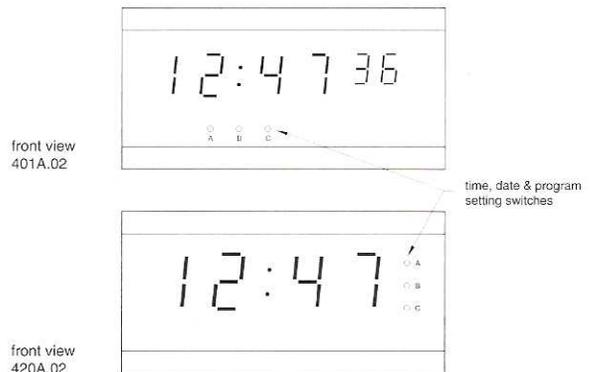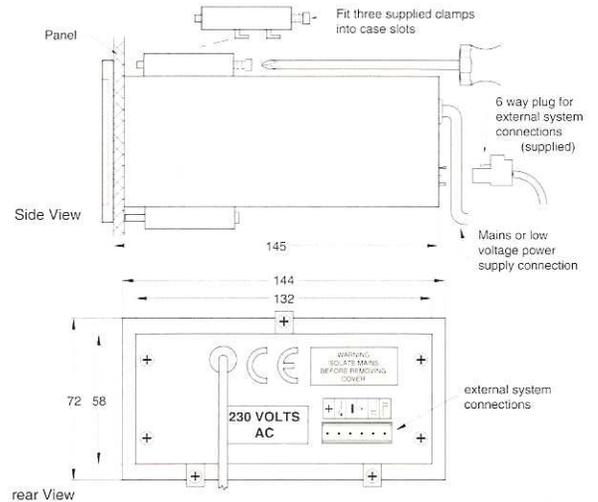sided clock

Case style .SS. - 'X' = 58
Case style .DS. - 'X' = 120

**single & double sided
ceiling suspended cases - type .SS & .DS**

for further information please request or download application note AN52

Panel

Side View

Fit three supplied clamps
into case slots

6 way plug for
external system
connections
(supplied)

Mains or low
voltage power
supply connection

rear View

WARNING
ISOLATE MAINS
BEFORE REMOVING
COVER

230 VOLTS
AC

external system
connections

front view
401A.02

time, date & program
setting switches

front view
420A.02

**401A.02 & 420A.02 flush
mounting clocks for control panels - type .FP**

for further information please request or download application note AN53

VORTEX

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