

Proud Partners with **MOBATime**



## **Clock movement 192/192 t**

for indoor and outdoor clocks up to Ø 80 cm. Radio controlled or synchronized by RS 232/RS 422 or equipped with accurate quartz.

Modular, state-of-the-art movement for indoor and outdoor clocks (with or without illumination) up to 80 cm, for hour and minute display. Execution 192 for non-transparent dials, 192 t for transparent dials.

Choice of three operation modes:

### **Model BU 192 / 192 t**

Synchronized by means of an 422 serial interface

type IF 494.

### **Model FU 192 / 192 t**

radio controlled by means of an internal or external time signal receiver DCF 77 or MSF 60.

### **Model QU 192 / 192 t**

controlled by means of a precision quartz, with programmable day-light saving time switch-over.

# Concept and Technology

## Basic movement BU 192/192t

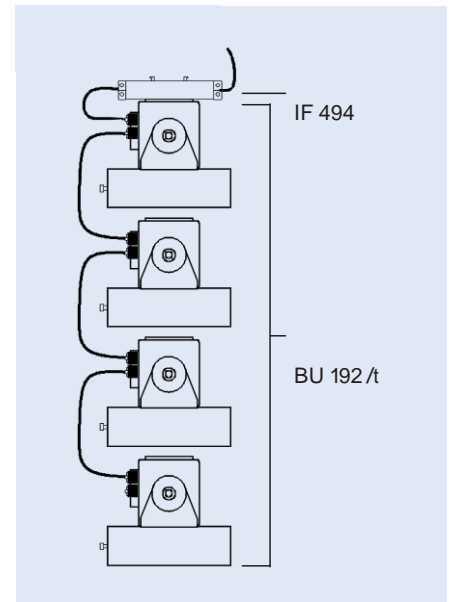
Movement in microprocessor technology, push button for time setting resp. 12.00 position. Choice of battery (built in battery compartment) or external mains power supply. By means of an external push button (10 m cable) the internal button can be remote controlled.

The basic movement can be controlled by the RS 232 / RS 422 serial interface type IF 494. By means of cascade linking, up to three slave movements BU 192/t can be connected.

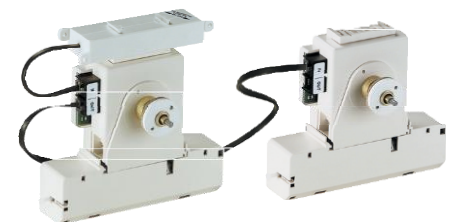
Furthermore, as a slave movement the BU 192/t can also be controlled by a radio movement FU 192/t or a quartz movement QU 192/t (cascading).



BU 192t



FU 192



FU 192t und BU 192t in cascade linking

## Radio movement FU 192/192 t

Combined with a time signal receiver, the basic model BU 192/t becomes the model FU 192/t. By means of cascade linking the FU 192/t can control up to three slave movements BU 192/t, i.e. for 2-, 3- or 4-sided clocks.

When working with a time signal receiver DCF 77, the synchronization for BU 192/t refers to CET (Central European Time). By means of a solder bridge the movement can also operate in the time zones CET+1 or CET-1.

### Radio time signal receiver

Models AD 192/192.5 for DCF 77-time signal.

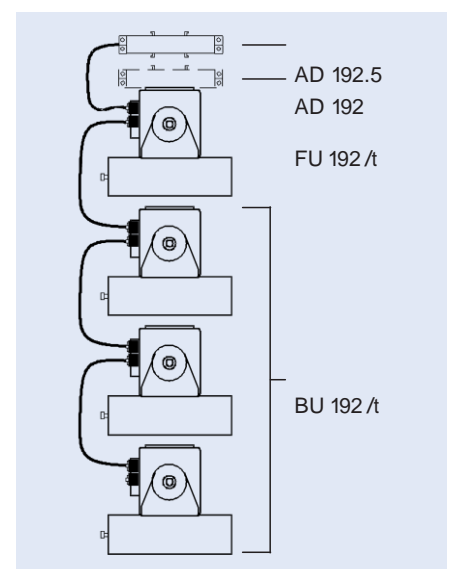
Models AM 192/192.5 for MSF 60 (England)-time signal. The radio receivers AD 192 and AM 192 are designed for the adaption to BU movements for in- and outdoor use. Indoor it can be extended by use of the cable CAB 192 up to 8 m.

The radio receivers

AD 192.5 and AM 192.5 with 5 m cable are designed for the external connection to an outdoor clock. Degree of protection IP 54.

### Time synchronization

After startup a red LED is flashing once a second until time reception is completed.



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## Quartz movement QU 192/192 t

The movement is equipped with a temperature compensated quartz with high accuracy. It can be used anywhere indoors or outdoors, where no other synchronization is available.

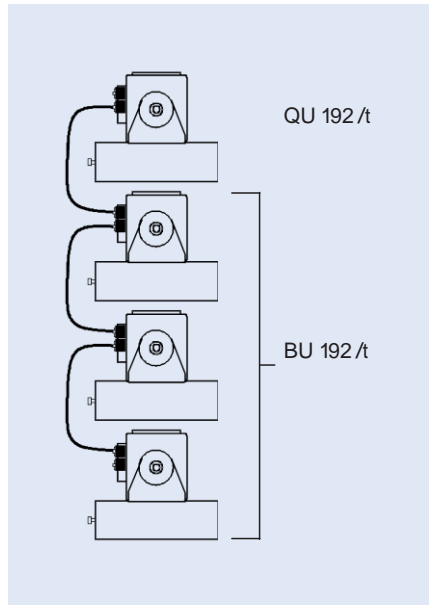
The exterior dimensions are the same as for model BU 192/t.

### Particular advantages:

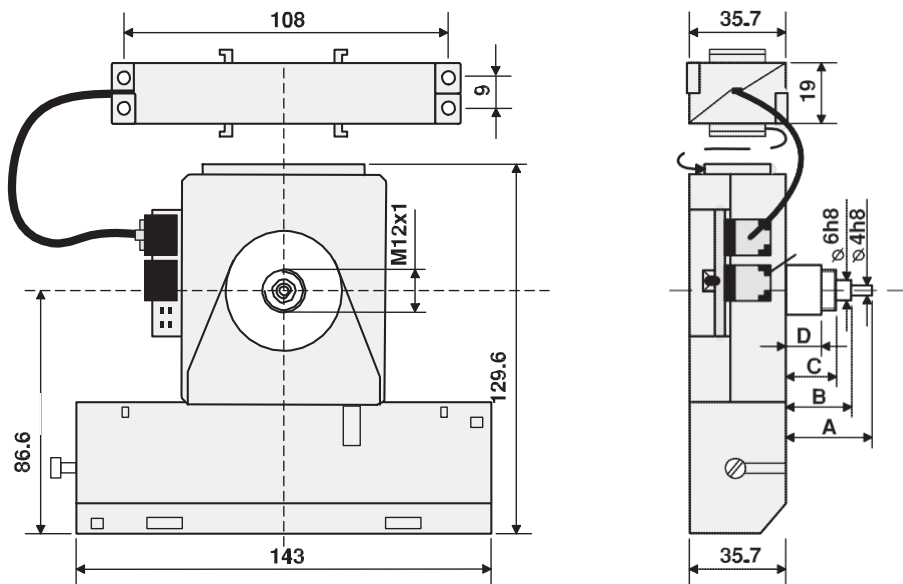
- For dials up to  $\varnothing$  80 cm.
- Daylight saving time programming.
- Exact time setting through serial inter- face by means of interface IF 494.
- Exact time setting by means of push button (1 minute, 1 hour or 11 hours steps).
- Control of up to 3 slave movements  
BU 192/t in cascade linking.



QU 192t



### Dimensions:



Measure table for FU/BU/QU	192	192t
Minute shaft A ( $\varnothing$ 4-0,02 mm)	18,9	34,0
Hour shaft B ( $\varnothing$ 6-0,02 mm)	11,9	27,0
Thread for central fixing C (M 12x1)	8,4	23,5
Distance sink tube D (mm)	—	8,0
Max. dial thickness (mm)	5,0	8,0

## Accessories

### Power supply

For all the models the following power supplies are available:

### Long life lithium battery LIT/3.6V

Life span of the battery about 6-7 years. For clock with two faces or more, one battery per movement is required.

### Power supply unit 230 V, 50 Hz / 2 x 3,7 VDC

With buffered storage battery for running reserve during mains breakdown. With one power supply unit two movements can be supplied, i.e. for doublefaced clocks. Running reserve at full charge:

1 movement about 14 days,  
2 movement about 7 days  
Life span of storage battery: Depending on conditions 2–3 years.

### Extension cable CAB 192

For external indoor mounting of the time signal receivers AD 192/AM 192 from the movement FU 192/192/t. Cable length 4 m. Extension with max. 2 x CAB 192 up to 8 m, incl. connector (SET).

### Cascade cable COM 192

For connection of a slave movement BU 192/192 t to a controlling movement of the 192 range, cable length 1 m.

### Interface IF 494

for the connection of a serial interface RS 232 or RS 422. Functions:

- Time control of BU 192/192 t over a periodical time telegram.
- Unique time setting and pre-programming of the automatic daylight saving time change-over for QU 192/t.

The interface is mounted in the same housing as the time signal receiver and can be plugged into the movement. Interface connection to the movement by means of connector and connecting cable (12 cm).

## Technical Data

Models 192 / 192t		Description	192	192.5	192.5 t	192.5 t	192.5 t	192.5 t
Order Reference-Number	200 xxx		205	206	203	204	309	310
Operation	DCF 77 (AD 192 adapted)		✓	✓	✓	✓	–	–
	MSF 60 (AM 192 adapted)		–	–	✓	✓	–	–
	time signal RS 232 / RS 422 for interface IF 494		–	–	–	✓	✓	✓
	✓ temp.comp. quartz with ± 60 sec / year at 0 · 40°C		–	–	–	–	–	✓
	✓							
Trait of reception for DCF, MSF	nearly all around reception with slant mounted, 180° reversible antenna		✓	✓	–	–	–	–
Synchronization	synchronization of the seconds: each hour complete time take-over: at startup, at least 2 x per night or by key touching		✓	✓	–	–	–	–
Control of hands position	1 x per 12 hour		✓	✓	✓	✓	✓	✓
Setting time:	12.00 o'clock (ex works)		✓	✓	✓	✓	✓	✓
Starting								
Running time to reference position	6 minutes maximum		✓	✓	✓	✓	✓	✓
Read-in of time telegram	< 3 minutes (at perfect reception)		✓	✓	–	–	–	–
Running time for new adjustment	3 ... 12 minutes (at perfect reception)		✓	✓	–	–	–	–
Changes of daylight saving time	5,5 minutes maximum		✓	✓	✓	✓	✓	✓
Setting of time, su/wi-time for QU 192 / QU 192 t	actuating key as per description		–	–	–	–	✓	✓
Power supply for in- and outdoors	1 x 3,6 V Lithium-battery *		✓	✓	✓	✓	✓	✓
For indoors only	power supply for 230 V/50 Hz, 3,6 VDC *		✓	✓	✓	✓	✓	✓
Life span of batteries	2 x 1,5 V IEC LR 20 (Mono) *		✓	✓	✓	✓	✓	✓
	2 x 1,5 V LR 20 batteries approx. 3 years;		✓	✓	✓	✓	✓	✓
	1 x Lithium-battery approx. 6-7 years		✓	✓	✓	✓	✓	✓
Actuation	1 motor for minute- and hour hands		✓	✓	✓	✓	✓	✓
Step frequency of minute hand motor	display mode 1 step/min		✓	✓	✓	✓	✓	✓
	setting mode 2 steps/sec.							
Dimensions of hands max.	as per DIN 41092/3 for dial Ø upto 80 cm		✓	✓	✓	✓	✓	✓
Weight of hands max.	balanced min.-hand 140 g, hour-hand 110 g		✓	✓	✓	✓	✓	✓
Fixing	central nut M12 x 1 mm		✓	✓	✓	✓	✓	✓
Operation and stocking temperature	- 30°C upto +70°C		✓	✓	✓	✓	✓	✓
Operation and stocking temperature (compare drawing)	B 143 x H 149 x T 35 mm		✓	✓	–	–	–	–
	B 143 x H 130 x T 35 mm		–	–	✓	✓	✓	✓
Colour	cream white RAL 9001		✓	✓	✓	✓	✓	✓
Weight without batteries	gram		310	350	260	300	260	300
* Power supply and batteries	NOT INCLUDED in delivery		–	–	–	–	–	–

## Radio reception

Model	Description	indoors		outdoors		Referece-No.
		Standard	Extendable by CAB 192	Standard	Extension	
AD 192	DCF 77·Radio time signal receiver AD 192	✓	4/8 m	✓	–	200208
AD 192.5	DCF 77·Radio time signal receive AD 192.5	–	–	–	5 m	200330
AM 192	MSF 60·Radio time signal receive AM 192	✓	4/8 m	✓	–	200209
AM 192.5	MSF 60·Radio time signal receive AM 192.5	–	–	–	5 m	200331
Options:						
Extension cable CAB 192 as a set,		for indoor use only				700471 & 700469
with connectors and plugs (Length = 4 m)						
Cascade cable COM 192 with connectors (Length = 1 m)		within a protected housing (IP 54)				200045
Long-life Lithium batteries, 3,6 V						B598 3000 0000
Power supply unit for 230 V/50 Hz, 2 x 3.7 V DC		for in- and outdoors				201670
Interface IF 494 plugable, with connection to serial interface RS 232 oder RS 422						200328



Swiss Time Systems

Grayson Time Management Systems