MOBALine Movement

Self-setting movement with hour, minute and second display. Suitable for indoor and outdoor clocks with dial diameters up to 400 mm.

SEM 40 V2 / SAM 40 V2

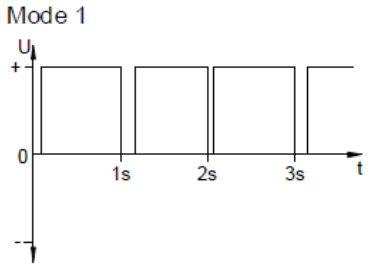
Types:

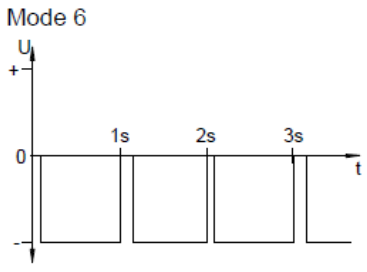
SEM 40 V2 (with second) Art. Nr.: 129426
SAM 40 V2 (without second) Art. Nr.: 129425

- Fully controlled by a connected MOBALine master clock. Automatic time adjustment and daylight saving time changes. Signalization of missing MOBALine code reception after 24 hours by setting the hands to 12:00 position.
- The movement supports synchronization with DCF active signals of modes 1, 3, 4 and 6 (see below). Summer and winter time changeover takes place automatically. A failure of the time signal is indicated after 7 days by setting the hands to 12:00 o'clock.
- The DCF-impulse code is also supported.
  Same function as DCF active.
- Two motors: minute / hour and second.
- Different running modes (stepwise or continuous) of the minute and second hand selectable by means of DIP-switches. When using MOBALine, the running mode can also be set on the master clock.
- World time function supported by selection of a MOBALine world time zone (1 out of 20 selectable by DIP switches). This function is not available with DCF active signal.
- Fully powered by the connected time signal.

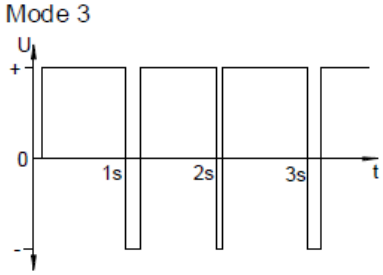
DCF active supported modes:

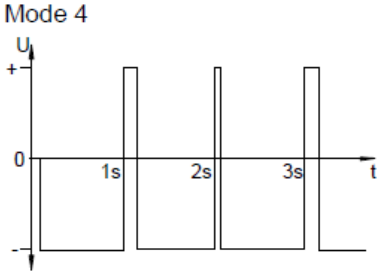
Unipolar:



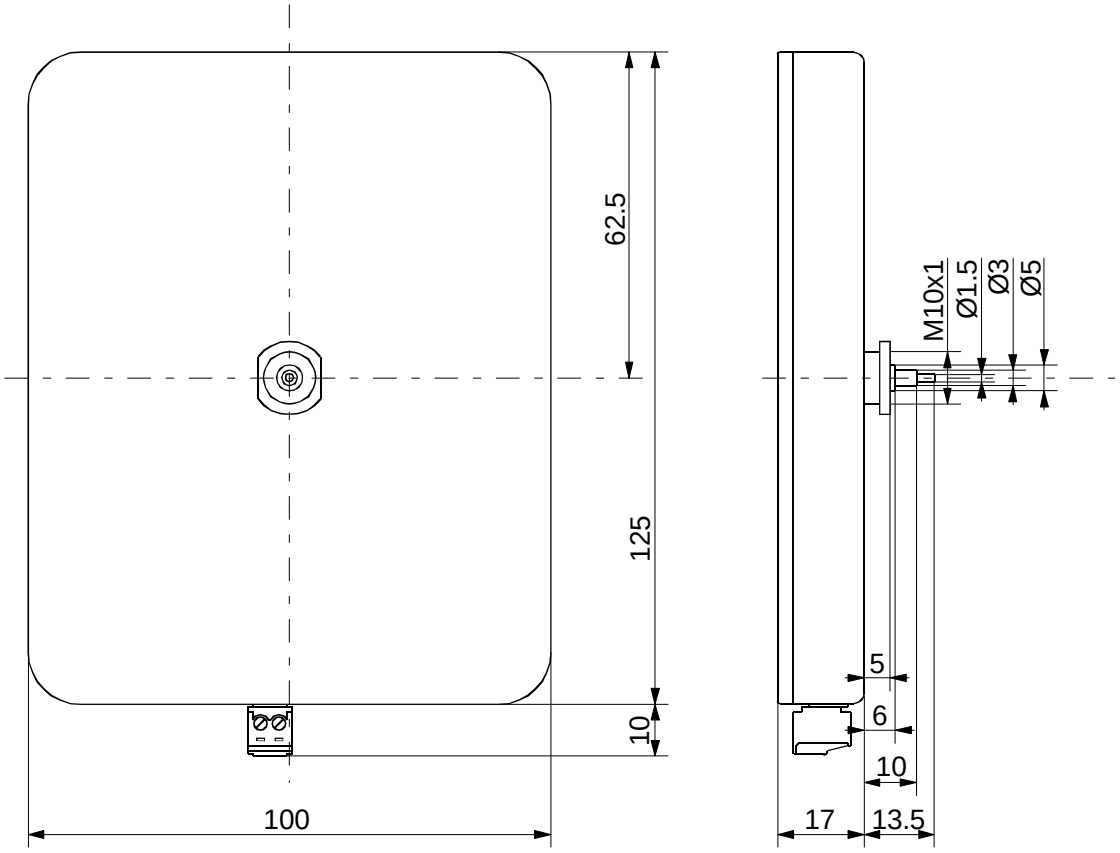


Bipolar:



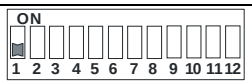
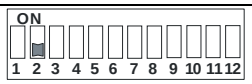
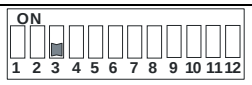
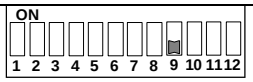
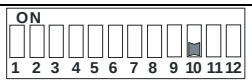


1 Dimensions



2 Configuration

The movements SEM 40 / SAM 40 V2 have 12 DIP switches on the housing back side. The following configuration settings are possible:

Switch:		**Position OFF:**	**Position ON:**
1		Movement runs on time (if synchronized and no other MOBALine command is active)	Movement runs to 12:00 position
2		Second hand in stepwise mode	Second hand in continuous mode
3		Minute hand in stepwise mode	Minute hand in continuous mode
4 - 8		Clock runs on the line time given out by the master clock: 4: 0 5: 0 6: 0 7: 0 8: 0	Selection of world time zone (binary value): 4: 1 5: 2 6: 4 7: 8 8: 16
9		Standard	Swiss Railway Mode (SBB). Overwrites the settings done with DIP switches 2 and 3.
10		Second and minute hand modes are defined by DIP switches (2/3/9)	Second and minute hand modes are defined by MOBALine (with DCF active, this switch is not used)
11 - 12	-	No function	No function

Recommendation: Set configuration switches prior to applying power (MOBALine signal).

3 Installation

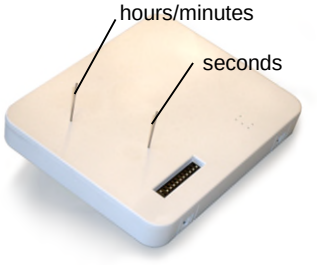


Illustration 1

1. Set the DIP switch 1 to ON or set the slave clock line of the MOBALine master clock to the STOP state
2. Connect the clock to the time signal (MOBALine or DCF active). (The input is located at the 6 o'clock position)
3. Wait until the movement stops
4. Insert metal pins carefully without force into the two holes on the back side (ill. 1). It should be possible to insert the pins about 6-7mm deep. Maybe move the hands slightly.
5. Mount the parts to the shafts in the following order:
   - rubber washer
   - dial
   - metal ring
   - ring nut (torque 4.5 Nm +/- 0.2)
   - hour hand
   - minute hand
   - second hand

   During the assembly, the movement must rest on a stable surface (ill. 2).
   Otherwise the movement can be damaged!

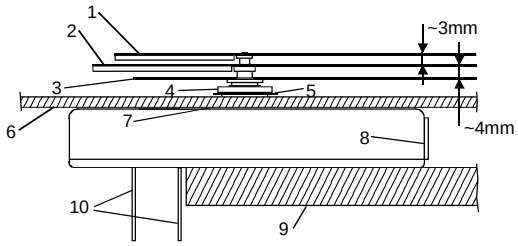


Illustration 2

1 second hand	6 dial
2 minute hand	7 rubber washer
3 hour hand	8 MOBALine input
4 nut	9 rest
5 metal ring (optional)	10 metal pins

6. Adjust the hands to 12 o'clock
7. Remove the pins
8. Set the DIP switch 1 to OFF or set the slave clock line of the MOBALine master clock to the RUN state

4 Maintenance

If maintenance is necessary, repeat the steps 1-8 in chapter 3.

5 World time function

The movements SEM 40 / SAM 40 support the MOBALine world time function. On the master clock (e.g. DTS, ETC, CTC or MTC) you can configure up to 20 different world time zones with different local time offsets (e.g. New York, London, Brussels, Tokyo, etc.) which will be transmitted to the slave clocks by means of MOBALine world time telegrams.

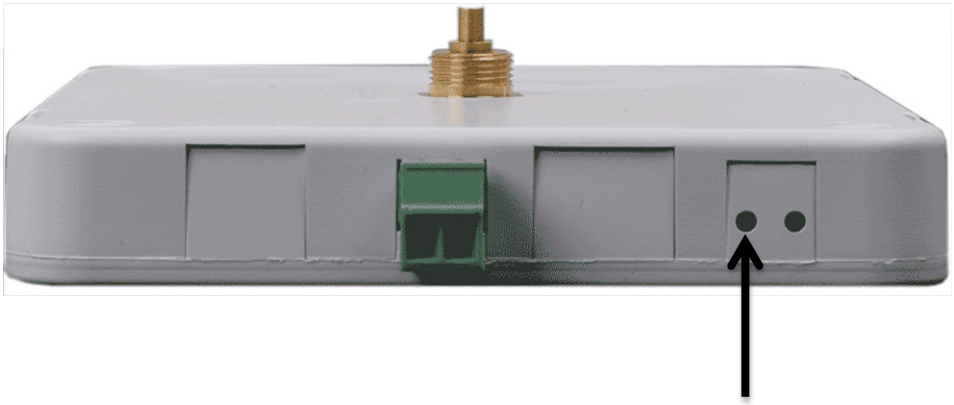
With the switches 4 to 8 one out of the 20 world time zones can be selected. Further details regarding the configuration of the world time function can be found in the manuals of the corresponding master clocks.

With the selection of an invalid time zone or one, which is not defined on the master clock, the normal MOBALine line time will be displayed. The same happens with the standard settings (DIP switches 4 to 8 set to OFF position).

6 Error codes

The LED (see picture below), shows always the current state of the movement:

LED behavior	**Explanation**
OFF	No power or signal available
Continuously ON	Startup of the movement
Flashes shortly every 10s	Normal operation
Flashes shortly 1x (every 3s)	No time information (see setting time after startup!)
Flashes shortly 2x (every 3s)	Low voltage on line input
Flashes shortly 3x (every 3s)	Mechanical problem detected



Status LED

7 Technical data

	SAM 40 V2	SEM 40 V2
Synchronization	MOBALine or DCF active	
Setting time after restart MOBALine: DCF active: Daylight saving time change	 < 3 minutes 20 seconds < 6 minutes when DCF signal reception is OK < 15 seconds	
Operation mode second shaft	continuous or stepwise	
Operation mode minute shaft	continuous or stepwise	
Operation mode hour shaft	continuous	
Operation voltage MOBALine: DCF active:	 10 - 20 V, 50 Hz 15 VDC…30 VDC	
Current consumption Average in second hand step mode: Average in sec. hand continuous mode: Max. current (during time adjustment):	< 4 mA @ 17 V < 8 mA @ 17 V	 < 5 mA @ 17 V < 8 mA @ 17 V < 10 mA @ 17 V
Autonomous operation in case of signal loss	MOBALine: 24 hours DCF active: 7 days Typical deviation: < +/- 2s after 24 h	
Accuracy (synchronized)	better +/- 100 ms	
Motors	1 (h / min.) clockwise / counterclockwise	2 (h / min. + sec.) clockwise / counterclockwise
Temperature range	-30 ... +70 °C	
Weight	155 g	165 g
Max. hand weight (well balanced)	hour: 7 g; minute: 18 g; second: 3 g	
Dial diameter	max. 400 mm	
Dial thickness	max. 3 mm	
Nut fixing torque	4,5 Nm +/- 0,2 Nm	
Torque on hour shaft	max. 2.8 mNm	
Torque on minute shaft	max. 1.4 mNm	
Torque on second shaft	max. 2.1 mNm	

8 Accessories

Position:	Descriptive name:	Part number:
1	Central nut M10x1 (2 mm wide, hole 10mm) Central nut M10x1 (4 mm wide, hole 12mm)	100815 105712
2	Rubber washer Ø 40 x 12.5 x 0.5 mm If needed (depending on dial thickness): Rubber washer Ø 40 x 12.5 x 1 mm Rubber washer Ø 43 x 12.5 x 2 mm	101550 105614 105613
3	Metal ring for dial protection (used for nut 203685 only) Ø 16 x 12.5 x 0.5	101494
4	Needles for hand mounting	100539

9 Complicancy

Certification of the Producer

STANDARDS
The movements SAM / SEM 40 V2 were developed and produced in accordance with the EU Guidelines:

2014 / 30 / EUEMC
2014 / 35 / EULVD
2008 / 57 / EURailway
2011 / 65 / EURoHS

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