



1. The SASM80 - General description

The SASM80 watch movement is a direct replacement for Ragen® / Riehl® LED watches. It substitutes Synchronar® Mark III and Sunwatch® modules and also fits all other Riehl cases.

The SASM8X series can be purchased in several versions to cover the different constructions and layouts of modules which were produced from 1972 to 1984.

- Mark III / Sunwatch® replacement (SASM80)
- Mark I replacement with MAN3A display (Dot-Display, SASM81)
- Mark II replacement (SASM82)

As known from other watch movements produced by StrikesAndSpares Semiconductor the SASM80 is built with original parts from disassembled Riehl movements. The plastic carrier, the solar cell, the quartz crystal, the reed switches and the display is swapped to the new SASM80 which then comes with the features and the look of an original movement.

2. The assembled module

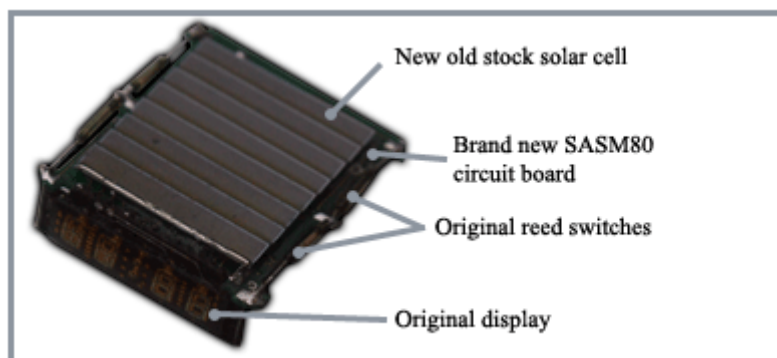


Fig. 1: components of the SASM80 module

3. Features of the module

The SASM80 module contains a time feature with an additional continuous seconds display. Moreover the watch has date and day of week display. The internal calendar comprises a leap year feature so that every 4th year includes a 29th of February. In case the original quartz crystal gains time for example due to aging there are two trimmers for a time correction. The fine trimmer is located on the lower right of the module. In addition the time can be adjusted through the new software trimming feature. All modules will be delivered unadjusted.

The control and the features of the SASM80 module exactly match the options of the Mark III movement. There are four functions which have been programmed supplementary. For example the day of week can be displayed in three different languages (English – German – French). The date display can be switched to the European readout of the form DD:MM, but is set to MM:DD by default. Leading zeros show up in date and time display if chosen. The module is able to operate with a AM / PM and military (24h) time display.

4. The time feature

Slide the right slider bar away to show the time. For a continuous second display slide both bars towards and release them again. Push the left or right slider away to switch the continuous seconds display off with the beginning of the next minute.



Fig. 2: time display



Fig. 3: continuous seconds

5. The date feature

Slide the right slider bar toward and release it display the date. Month and day will show up.



Fig. 4: date display

6. The DOW feature

To activate the day of week (DOW) feature, slide the left bar towards you to display DOW and seconds.



Fig. 5: DOW and seconds display

7. The leap year and frequency trimming feature

The leap year will come up in the display once the left slider is pushed away. The leap year is displayed on the most left digit, the value of the time correction including its algebraic sign follows on the next three digits.



Fig. 6: Leap year and time correction

8. Fine adjustment with on - board trimmer

Theoretically the modules are programmed in a way that the time computing is proceeded without tolerances. However a deviation of time can occur because of climatic differences in temperature, habits of the owner and the aging of electronic components. There is both hardware and software compensation available for modules which are running out of specification. A fine tuning (on board trimmer) can be done with a special screwdriver. Please mention, that there is no entitlement to a guarantee in case of damage through the customer.

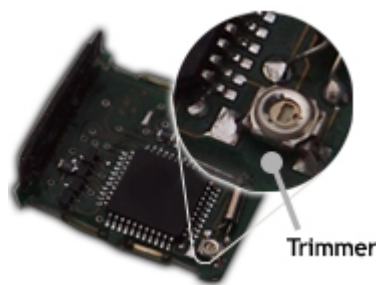


Fig. 7: solder side with trimmer

9. How to set time and date and how to trim the frequency

The date, the DOW, the time and the software trimming is achieved with the side sliders. We suggest starting with the DOW. Continue with the day, then month, hour and finish with the minutes. The software trimming feature is optional. We recommend beginning with time adjustments after one week of operation.

To change the DOW slide the left slider bar towards. Hold on. After a delay of four seconds push the right slider backwards. The day of week increases. Release both sliders at the desired day.

Slide the right slider towards and hold on for at least four seconds to change the date. You can use the left slider to advance month and day. Pull the slider to increase the month, push it away to set the day. If the month turns from December to January the leap year is also incremented. The leap year number „4“ indicates, that there will be a 29th of February.

To set the time slide the right slider bar away and hold on. You can advance minutes and hours with the left slider after a delay of four seconds. Slide the bar towards to increment the hour, move the left slider back to set the minutes. The time computing remains at :00 seconds until the right slider has been pushed to show the time and to start the time counter.

The software trimming feature may be used to adjust the time counting. To change the correction parameter slide the left slider bar away and hold on. After four seconds move the right slider backwards to diminish the value of the correction parameter, pull it towards effectuates an increasing value of the parameter. Example: If the watch gains half a second per day, choose the correction value -0:5 (minus 0,5). In case the watch is running too slow and loses one second a day, choose the correction value 1:0.



Fig. 8: Setting of the correction parameter

10. Additional features of the SASM80

Activate the DOW feature with the left slider and hold on for at least four seconds. Slide the right slider bar towards you to get access to the additional features menu. Release both bars. . The left slider is needed to choose settings within a menu item. Push the left slider away to set a feature, pull it towards to continue with the next item.

Choose the display of the date with the first menu item. Select „US“ for a standard MM:DD display of the date. The setting „EU“ will display the date in days, followed by month (DD:MM), just like people are used to in Europe.

Choose between 12 and 24 hour display in the next menu item. Once chosen 12h display the time display will show 11:32 at 23.32 for example or vice versa.

Choose the language of the day of week with the following feature. You can set the language to „EN“ (english) „DE“ (deutsch/german) and „FR“ (french) which then will display the short form of the DOW in the selected language.

The module can display leading zeros when activating time and date feature. If (:+0) is chosen in the next menu item, the date will be shown in the form 03:01 on 1st of March (instead of 3:1). Deactivate leading zeros in that you set the menu item to (--:).

Move the left slider towards you for a last time to quit the additional feature menu.

11. Rechargeable batteries

StrikesAndSpares Semiconductor suggests using two Varta NiMh accumulators. Either type V80H which originally has been installed in the watch or type V40, a smaller version of the V80H. We recommend to use V40H in watches with black Synchronar plastic backs and V80H in early versions with the red back and Monsanto MAN3A dot displays. The form of the V80H has been slightly changed during the years, so that the batteries do not properly fit the black bottoms anymore. The batteries should be exchanged in a 5 year time period.

12. Warranty

We deliver all SASM 80 modules with a full one year warranty. The appointed date of the warranty is the indicated date of the invoice. Please keep this invoice for your own records and as a document in case of a defect on the module which is covered by the warranty.

13. Assembling of module and case

The mounting of batteries and module in original plastic housings can be accomplished through StrikesAndSpares Semiconductor. We use an elastic glue to stick top and back of the housing together so that the parts can be unsealed again to service the batteries.

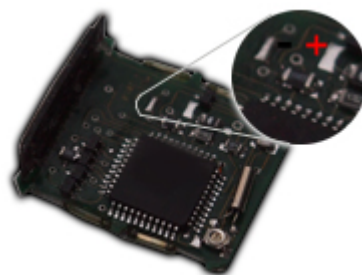


Fig. 9: Pads for ground and battery - plus

We do not seal modules and batteries in general, because the sealing prevents a battery change to be done by the customer. It is physically impossible to run watches without an exchange of the batteries for an unlimited time. A disadvantage adds up in a housing which is not assembled in a way to be water resistant. But it is immune to splash water indeed. On explicit customer request and against our technical comprehension StrikesAndSpares Semiconductor will seal your module with a silicon gel.

14. Software: Versions and updates

As all active SASM modules the SASM80 series also have a software version indicator. The version indicator will show up in the display when batteries are replaced. `SAS will appear on the display, followed by the software release and the module number, for example b:80.

The different software releases are arranged by the corresponding letter and are used in the manner below. All SASM8X modules can be updated to the latest release, which is 29, 90€ per module.

- E: Initial release
- A: 1st software modification
- b: 2nd software modification
- c: 3rd software modification
- d: experimental release
- F: 4th software modification
- H: 5th software modification

15. Final comments

Occasionally we receive letters and emails from customers which bought valuable watches of notable watch makers over 40 years ago. Quite often these watches have stopped working when they became less interesting in the 1980s and the batteries started to leak. The point of time, when these watches are resurrected from life in the drawer into fully working condition is a very special moment for our customers and us as well.

We do not intend to sell SASM modules as original ones and we do not want to mislead customers in that they think they might buy an original module from the 1970s. StrikesAndSpares Semiconductor makes concentrated efforts on the development of modules with the goal of a worthy replacement for original movements in respect of the function and the look. We produce new modules with original components and the newest semiconductor technology and assemble exclusively by hand.

We hope, that you take much pleasure in your LED - watch with the expectation, that we could preserve one of your watches in working condition for ensuring ages.

Hanno Spick

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