

# SYNCHRO TIMER

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## Overview

SYNCHRO Timer is an autonomous scheduling and power-control module designed for long-duration subsea deployments. Acting as an inline smart switch between an external battery pack and a connected instrument, SYNCHRO Timer enables precise duty-cycled operation by physically disconnecting power outside programmed time windows.



## Features

Optimized for ultra-low standby consumption, it significantly extends mission duration in deep-sea and remote environments.

- Programmable scheduling (start time, on-duration, repeat interval)
- Physical power disconnection at the battery level
- Ultra-low standby current in sleep mode
- Integrated high-side P-MOSFET for efficient switching of high-current loads
- Precision Real-Time Clock (RTC) for deterministic scheduling
- Reverse-polarity protection
- Visual LED status indication
- USB configuration interface with user-confirmed arming

SYNCHRO powers only its internal control electronics; connected instruments are powered exclusively by the external battery system.

Designed for harsh environments and mission-critical reliability, SYNCHRO provides a robust and energy-efficient solution for periodic sampling applications such as hourly or daily measurements.

## Interfaces

MCBH2M: Power-in | MCBH2F: Power-out | Status LED Port

# SYNCHRO TIMER

## Autonomous inline power scheduler for duty-cycled subsea instruments

– Solid-state high-side switching with deterministic RTC scheduling –

### Mechanical:

- Depth Rating: 4,500 meters
  - Hard anodized 6061-T6 aluminum
  - Weight: 2.5 Lbs (in air), 1.25 Lbs (in water)
- Depth Rating: 500 meters
  - Black acetal plastic
  - Weight: 1.5 Lbs (in air), .25 Lbs (in water)
- Dimensions: 7.5" length × 2.88" outer diameter
- End-cap O-rings: 2 x #134 Buna-N

### Electrical (Control Electronics):

- 3 x AAA batteries
- RTC powered via CR1220
- Sleep mode: < 0.3 mA typical
- Active (during ON window): ~10 mA typical

### Battery Pack Compatibility:

- Power Input: 6–28 VDC
- Maximum Current: 10 A
- High-side P-MOSFET switching (solid-state, no mechanical relay)

### Microcontroller:

- Seeed Studio XIAO nRF52840

### Programmable with:

- Arduino-type sketch

### Autonomy (Control Electronics Only):

- 2Hrs per Day: approx. 3.5 weeks
- 1Hr per Day: approx. 5.5 weeks
- 10min per Hour: approx. 2 weeks

