Multifunctional Mainboard to Observe and Manipulate Organisms (MOMO)

Automating the recording and manipulation of animal behavior

Peter Loës & Peter Skripsky
Department Kempenærs

Specifications of MOMO:

- Compatible with a variety of radio clock receivers (e.g. USA 60kHz, China 68.5kHz, France 162kHz)
- Weather resistant housing for circuit board, wiring, accumulator/batteries and external triggers (e.g. camera)
- LED lights on battery accumulator board indicate the charge of lithium-ion batteries
- Only uses Deep Sleep Mode (0.9µA at 3V) and Sleep Mode (45µA/MHz at 3V) → long battery life
- Capacitor can be used to power the device for short periods (e.g. during battery replacements)
- SD cards with large memory (weeks – months without SD changes)

MOMO circuit board

Battery accumulator

Example settings:

Operating time of the feeder:

ON_TIME = 04:00
OFF_TIME = 23:00

Shutter (food flap) open and close durations:

KEEP_OPEN = 10
KEEP_CLOSED = 0

RFID reader settings:

RFID_PWR_OFF_TIMEOUT = 360 (6 minutes)
RFID_DETECT_TIMEOUT = 20

Camera trap duration:

CAM_DURATION = 15 → keeps camera on for 15 seconds after light barrier is inactive

RFID tag/transponder
8,3 mm

RFID ID-specific configurations:

ID = ANY:0 → for any other ID or unknown individual closes feeder immediately
List of IDs allowed to feed:
ID = 161CE7D001AF0001
ID = E21CE7D001AF0001
Etc…

Output example from feeder with shutter and RFID ID-specific settings:

20181115-040000.000 Feeder is switched ON
20181115-040000.003 RFID is powered ON
20181115-040021.000 Transponder: UNKNOWN not found - using ANY:0:0:15
20181115-040021.001 Shutter will be closed
20181116-084625.653 Transponder: E405C4B43A6F0001:10:0:15
20181116-084625.654 Shutter will be opened
20181116-084636.000 Shutter will be closed

Max-Planck-Institut für Ornithologie

MAX-PLANCK-GESELLSCHAFT