HM-3 *Product Brief*

Version 1.0

MBRose

The HM-3 system is a tracking system for enriched large group housing environment, tracking voluntary activity in rats. It houses up to 48 animals in one cage and gives them the opportunity to jump, go uphill, speed up, climb, hide or segregate from the group.
It presents automated individual tracking data and body-weight 24h/7.

Possible Research Applications

Any research that involves monitoring health **or** voluntary activity in group-housed rats.

- Pain
- Chronic pain
- Osteoarthritis
- Oncology

Benefits

- Designed for high standards of hygiene and easy to clean
- RFID tag identification of individual animals
- Dual connection, RJ45 with power and serial interface to the Weight and RFID reader connect seamless to the embedded controller and the central Lab-PC.
- Data collection in HMBase SQL database allows robust collection of information, which is made available by HM3View or via interface filters to Excel®, SigmaPlot® and Graphpad Prism®.
- Simple station validation and tare function from the individual station keypad or system wide from the Lab-PC.
- Low power units with light dimmer on control and lamps enable easy rack-integration and use in shifted daylight applications.
- A system built in HW diagnostic and calibration function allows load cell calibration to meet company quality standards.
- An UPS unit can be installed to avoid outside power failures
- Can be customized to other setups

Body Weight and Activity Monitor Online.

The integration of the water access in the BW-1 support regular weighing of all animals several times per day as they are arriving to drink
The Bodyweight data is collected without human intervention. The system records the start time of each entry into the BW-1 weighing tube, the duration of the stay and the finishing time. Setup configurations allow the researcher to establish the parameters for the experiment, study and session in advance.

Body weight unit - BW

Jump Hole Activity Monitor Online.

The jump hole detector, JP-2, is optimized for fast reading and immunity to interference with other RFID readers.
With the lining tubes available in various lengths and positioned by the press flanges in the jump hole, the jump height is a simple variable of the experiment, set individually for each jump hole

Tracking Point Activity Monitor Online.

The TP-1-700 detector is optimized for fast reading and immunity to interference with other RFID readers.
The TP-1-701 detector is enabled by IR beam break when passing the loop for zero radiation of 134.2 kHz excitation. First read latency is approximately 250 ms.

Jump holes - JP

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Embedded controller.
The EMB-19i controls the individual rack, monitoring sensors and communicates with the LabPc.
From a system perspective it makes the rack self-contained storing data locally until its synchronised.
The EMB-19i includes a health alarm function keeping track of animal activity.

Data processing
The experiments, studies and sessions are centrally controlled by the HM03Lab application running at the central Lab-PC. The data collection software ensures robust storage of raw data in the HMBase SQL database and data view is available in HMView presenting the data quickly at the researcher's desk for check of experiment results. Data may be extracted via filters to SigmaPlot®, Graphpad Prism® and Excel®, for in-depth correlation with other research. Export facilities to corporate database structures are also available on request.

RFID Identification of individual animals
The individual animals housed together in the same cage, are identified using ISO FDXB RFID tags, e.g. UNO BV, DataMars®, Pet-ID®, e-Vet®. Tagging is a safe way of identifying individual animals and integrated with MBRose weigh stations and scanners, it can secure a fully automated tracking of animals through the entire experiment.

Mechanical outline.
The HM-3 system is mounted in a Rat Colony Cage, based on a Techniplast F-Suite.
The HM-3´s mechanical outline separates the system into seven parts.
1) Body weight stations on level 4. BW-1+2.
2) Jump holes from level 1-2 and 3-4. JP 1+2
3) Tracking Point from level 2-3. TP 1+2
4) Water source on level 1 and 4. H_2O.
5) Food source on level 1
6) Embedded controller unit – EMB-RDMBS
7) Laboratory PC with the HM03Lab software installed – Lab-PC
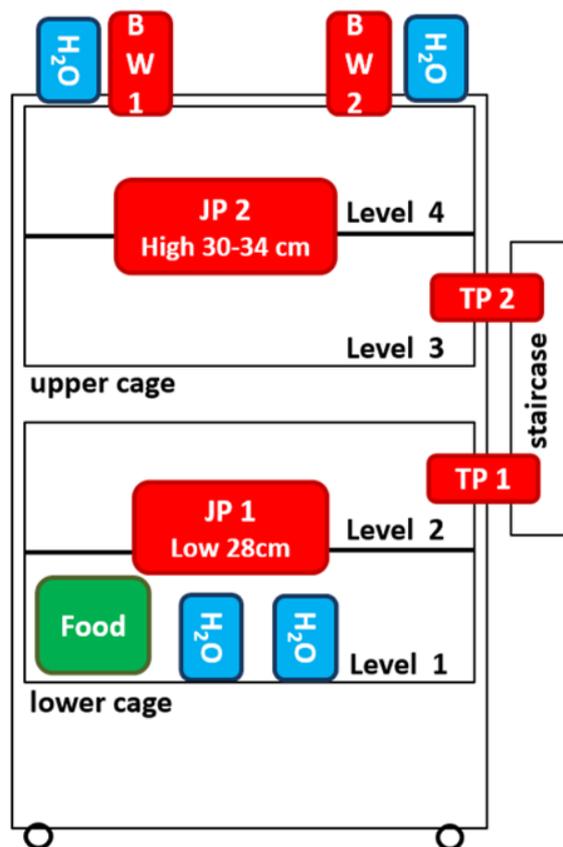
EMB-19i
RDMBS

Lab-PC HM03La
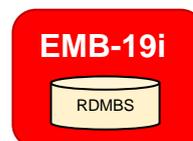
Parts	Abbreviation
Body Weight 1 + 2	**BW-1 + 2**
Jump Hole 1 + 2	**JP 1 + 2**
Tracking Point 1 + 2	**TP 1 + 2**
Embedded Controller Unit	**EMB-19i**
Laboratory PC	**Lab-PC**
Food source*	**Food**
Water source*	**H2O**

*Standard Techniplast items