



## Specifications: IceSpy MR-T Recorders for RL system

### Recording Channels

- Up to three channels available
- One channel for internal thermistor sensor (-40C to +60C)
- One channel for optional external temperature sensors (-50C to +150C)
- One channel for optional external door sensor (open / closed)
- Recording interval 4 to 60 seconds or 1 to 240 minutes
- Delayed recording start time: 1 minute to 1 month
- Can be configured to record maximum temperature during each time period
- Can be configured to record minimum temperature during each time period
- Can be configured to record temperature at exact time of period (default)

### Memory

- Unique fixed serial number pre-programmed into each unit.
- Option to stop recording when full or to overwrite oldest data
- Nonvolatile EEPROM (battery not required for preservation of data)
- 21-character spaces for each recording channel (programmable from PC)
- 21-character space for general description (programmable from PC)
- 6656 date/time/temperature records, divided between used channels:
- 3328 records if two channels are programmed
- 2218 records if three channels are programmed
- Maximum recording time before overwriting: 3 years (1 channel, 4 hour recording)
- Minimum recording time before overwriting: 147 minutes (3 channels, 4 sec recording)

### Alarms

- Two LED indicators on sensor, either or both flash every 2 seconds
- High and low alarm levels configurable via PC in 1.0C increments
- Alarm delay configurable up to 3 hours after levels are exceeded
- Yellow: "all clear"; Red: "alarm state"
- Both Red & Yellow: all clear now, but alarm has occurred since last download
- Alarms not activated until recording starts

### Temperature accuracy (internal sensor)

- Meets UK Food Hygiene Regulations
- +/-0.5C between -25C and +40C (all instrument errors combined)
- +/-1.0C between -40C and -25C (all instrument errors combined)
- +/-1.0C between +40C and +60C (all instrument errors combined)
- Optional calibrations available to provide +/- 0.25C between -25C and +40C



## Radio

- Frequency: 433.9 MHz (UK/Europe), licence-free band. ETSI 300-220 standard.
- Power: max 10mW (+10dBm); typical +6dBm
- Range: up to 300 metres in free space, 50m in building. (Depends on position of antenna, and building construction). Less range below -10C or above +50C
- Transmission rate approx. every 45 seconds. Length of radio packet approx.30-40 ms
- Information transmitted: unique IceSpy recognition, serial number, latest temperature and door open times, data check value

## Mechanical / Environmental

- Dimensions: 185 x 25mm diameter max. Weight: approx. 80g.
- Case: ABS (Acrylonitrile Butadiene Styrene)
- Operating temp. range: -40C to +50C, humidity 0-100%.
- Dust / Waterproofing: IP66/68 (no external sensor connected)
- Dust / Waterproofing: IP64 (with external sensor connected)
- Connector for external sensors / communications: BNC
- Integral loop for security fixing

## Battery

- Chemistry: Lithium Thionyl Trichloride, capacity: 2000 mAH
- Life (10-minute recording, one printout or PC download per week): >12 years
- Life (4-second recording, one printout or PC download per day): >8 years

## General

- Setup (configuration) options available from PC: time between readings, channel settings, text descriptions, overwrite or stop when full, advance start, values to record, alarm levels, alarm response time, set password, save and restore configurations.
- Clock accuracy: +/- 2 seconds per day.
- Communications to printer via 9600 bps serial link, conversion to RS-232 in separate cable MR-PL
- Communications to PC via 9600 bps serial link, conversion to RS-232 in separate cable MR-PCK
- Download time approx 300 records per second, 8-bit summing error check
- Proprietary 'IceSpy' protocol, accessible only via 'IceSpy' PC application.
- Unauthorised setup preventable by use of password in PC configuration



## Specifications: IceSpy MR external sensors

All accuracies are given with all instrument errors combined

### Range / Accuracies: MRS-L, MRS-A

- Meets UK Food Hygiene Regulations
- +/-0.5C between -25C and +40C
- +/-1.0C between -40C and -25C
- +/-1.0C between +40C and +60C
- Optional calibrations available to provide +/- 0.25C between -25C and +40C

### Range / Accuracies: MRS-M

- Meets UK Food Hygiene Regulations
- +/-0.5C between +15C and +75C
- +/-1.0C between -5C and +15C and between +75C and +105C
- +/-2.0C between -20C and -5C and between +105C and +130C
- Optional calibrations available to provide +/- 0.25C between +15C and +75C

### Range / Accuracies: MRS-H

- Meets UK Food Hygiene Regulations
- +/-0.5C between +45C and +105C
- +/-1.0C between +25C and +45C and between +105C and +135C
- +/-2.0C between 0C and +25C and between +135C and +150C
- Optional calibrations available to provide +/- 0.33C between +45 and +105C

### Door switch: MRS-D

- Smallest time interval recorded: 4 seconds
- Data presentation: minutes open per recording period (e.g. 3 mins total open)
- Short open times (less than 59 secs) appear as whole minute for clarity
- Short closed times (less than 59 secs) appear as whole minute for clarity
  
- Dimensions of standard magnetic actuator : 30 x 20 x 6mm (larger mechanical actuators also available for large sliding doors)
- Cable material: PVC screened RG58
- Standard cable length: 1500mm (other lengths available to order)
- Connector: BNC
- Dust / Waterproofing: IP65 (including connection to recorder)



## **Mechanical / Environmental (MRS-L, MRS-M & MRS-H)**

- Standard dimensions of probe tip: 60mm x 4mm diameter (other sizes available)
- Probe material: 316 Stainless Steel
- Cable material: PTFE / FEP screened RG316, tested to MIL-C-17/172
- Standard cable length: 1500mm (other lengths available to order)
- Connector: BNC
- Operating temp. range: see accuracy tables above
- Dust / Waterproofing: IP68 (excluding connection to recorder)
- Dust / Waterproofing: IP65 (including connection to recorder)

## **Mechanical / Environmental (MRS-A)**

- Standard dimensions of probe tip: 20mm x 7.5mm diameter
- Probe material: black polyolefin
- Cable material: PVC screened RG58
- Standard cable length: 1500mm (other lengths available to order)
- Connector: BNC
- Dust / Waterproofing: IP66 (excluding connection to recorder)
- Dust / Waterproofing: IP65 (including connection to recorder)

## **MRS-ADAPT**

- BNC T-piece connector
- Enables MRS-D and MRS-L (etc) to be connected to MR or MR-T recorder at the same time