# *EXACT*

## Datasheets 2024

# Monitor

Produce to project specifications and eliminate product rejections by monitoring your critical data in real time. Material temperatures, ambient temperature and relative humidity are available at a glance with seamless reporting and alerts.

|  | Flex Logger | Relay V2 | Embeddable Logger | Pro Logger | Relay |
|---|---|---|---|---|---|
| Technology | Monitor 2.0 | Monitor 2.0 | Monitor 1.0 | Monitor 1.0 | Monitor 1.0 |
| Communication | LTE-M, LoRa | LTE-M, LoRa | LoRa | LoRa | LTE-M, LoRa |
| GPS | Yes | Yes | No | No | No |
| BLE Offline Reclaim | Yes | Yes | No | No | No |
| Probe Ports | 4 | 0 | 4 | 4 | 0 |
| Ambient | Yes | Yes | Yes | Yes | Yes |
| Optional Humidity | Yes | No | No | Yes | No |
| Charging Port | Yes | Yes | No | No | Yes |
| Remote Firmware Updates | Yes | Yes | No | No | Yes |
| Remote Fault Detection | Yes | Yes | No | No | No |
| Battery Life @ 15 min Reporting | 4 months (LTE) 24 months (LoRa) | 4 months | 1 month | 18 months | 1 month |
| Memory | 90 days | N/A | 21 days | 21 days | N/A |
| Connector Type | 4-pin | N/A | 2-pin barrel | 2-pin barrel | N/A |
| Digital Probe Support | Yes | No | No | No | No |

# Flex Logger

The most flexible and robust temperature and relative humidity monitoring system for precast and cast in place projects. Flex logger works stand-alone in LTE mode or can be grouped together in LoRa mode with multiple Flex loggers a Relay V2 for extended battery life and radio range. Using plug and play probes, measurements are accurate, reliable and require minimal labor to prepare. Rugged and reliable, the hardware is waterproof and steam proof and can be used in extreme environments.

**SKU: EX-FL-1**

## Features

- Multiple wireless radios
  - **LTE Cat M1 / NB-IOT cellular**: For stand-alone use (no Relay required).
  - **LoRa**: Logger communicates with Relay V2 and extends battery life and relays signal into hard to reach areas
  - **\*BLE**: download data onto your phone in areas where cellular connectivity is unavailable
  - **\*GPS:** locate your device in the field
- 4 x analog/digital temperature ports
  - New 4-pin connector to improve robustness to moisture and physical damage
  - Supports analog and digital temperature probes
  - Supports user replaceable ambient humidity probes*
- On-board temperature sensor
- 90+ day offline memory
- Local log retrieval via BLE on mobile phone
- Built-in charging port
- LED indicator for battery and signal status
- Remote firmware over-the-air (OTA) updates
- Remote fault detection
- Sustainable design
- For outdoor and indoor use
  - Outdoor use without the charger
  - Indoor use with the charger

## Technical Specifications

| | |
|---|---|
| **# of Inputs** | Temperature: 4 external + 1 ambient RH: 1 external |
| **Device Operating Range** | -20°C to 50°C (-4°F to 122°F) |
| **Measurement Range** | -30°C to 120°C (-22°F to 248°F) |
| **Accuracy/Resolution** | ±0.2°C (±0.4°F)  / 0.1°C (0.2°F) |
| **Battery** | Runtime: 4 months (LTE). 24 months (LoRa). Charge time: 14 hrs |
| **Input Voltage** | 5.0V ⎓, 2A Max 10.0W |
| **Relative Humidity** | 0-100% RH |
| **Altitude** | Up to 2000 m |
| **Interval** | Default: 15 min. Opt: 1-60 min. |
| **Memory** | 90 days @ 15 min intervals |
| **Country Compatibility** | See appendix |
| **Pollution Degree** | II |
| **Cellular Technology** | **LTE Cat M1, NAmer**: Bands 2,4,12. **Europe**: Bands 3,8,20. **Australia**: Bands 28. **LoRa:** 915 MHz (CA/USA/AUS) / 868 MHz (EU) |
| **Radio Range** | **LoRa**: >800 m line of sight to Relay **LTE**: ~1 km line of sight to tower |
| **Ingress Protection** | Dust/Steam/Waterproof - IP67 |
| **Dimensions** | 5.85” x 4.65” x 2.15” (149 x 118 x 55 mm) |
| **Weight** | 2.1 lbs / 953 g |

WIRELESS

# Relay V2

Receives wireless data from EXACT loggers that transmit using LoRa and relays the data via LTE-M to the EXACT cloud. Relay is required for embeddable loggers. Relay can be used with Flex and Pro loggers when: a) LTE signal is not available where loggers are installed but is available nearby where Relay can connect. b) Installations with 10+ loggers where it's more economical to connect multiple loggers via LoRa to a single Relay with LTE.

**SKU: EX-R-2**

## Features

- Multiple wireless radios
  - **LTE Cat M1 cellular**: remote wireless communication
  - **LoRa**: local device-to-device wireless communication
  - **\*BLE**: local mobile-to-device wireless communication
  - **GNSS location**
  - **\*GPS**: remote device retrieval
- Remote firmware over-the-air (OTA) updates
- Remote fault detection
- 4-month battery life
- 90+ day offline memory
- Local log retrieval via BLE
- Internal charging port

**\* Available Spring 2024**

**NOTE:** Specifications are preliminary and subject to change without notice.

## Technical Specifications

| | |
|---|---|
| **# of Temperature inputs** | 1 ambient |
| **Operating range** | -20°C to 60°C (-4°F to 140°F) |
| **Battery type** | Rechargeable - Charger included |
| **Battery life** | 2 months |
| **Battery charge time** | 14 hrs |
| **Charger voltage** | 5V |
| **Opt. battery range** | 3.0V - 4.2V |
| **Interval** | Default: 15 min / Optional: Always-On |
| **Cellular technology** | **LTE Cat M1**<br>NAmer: Bands 2,4,12 (1900/1700/700 MHz)<br>Europe: Bands 3,8,20 (1800/900/800 MHz)<br>Australia: Bands 28 (700 MHz)<br>**LoRa Frequency:**<br>915 MHz (CA/USA/AUS) /<br>868 MHz (EU) |
| **Country compatibility** | See appendix |
| **Radio range** | LoRa: >800 m line of sight to Relay or another device<br>LTE: ~1 km line of sight to tower |
| **Ingress protection** | Dust/Water Resistant |
| **Dimensions** | 9.1" x 6.8" x 3.8" (231 x 173 x 97 mm) |
| **Weight** | 2.1 lbs (953 g) |

# Embeddable Logger

Fast installation, high reliability, extremely durable, real-time, online temperature monitoring for cast-in-place concrete. Sacrificial sensor is installed in formwork (generally on rebar) and covered in concrete. Sensors transmit via long range radio to our relays that transmit the data via cellullar signal to the EXACT online portal.

**SKU: EX-EL-1**

## Features

- Up to 4 temperature probes, ideal for mass concrete (bottom, core, surface, ambient/tarp)
- 24/7 real-time online monitoring via EXACT Wireless Relay
- Always recording temperatures, data can be recovered wirelessly in real-time, or at a later date
- 30 day battery life (active monitoring) / 1 year battery shelf life

## Applications

- Maturity + strength estimation
- Mass concrete thermal monitoring
- Cast-in-place concrete
- Precast mass concrete thermal monitoring

## Technical Specifications

| | |
|---|---|
| **# of Temp. Inputs** | 5 (4 external + 1 ambient) |
| **Operating Range** | -20°C to 60°C (0°F to 140°F) |
| **Measurement range** | -40°C to 120°C (-40°F to 250°F) |
| **Battery type** | Single use (non-rechargeable) |
| **Battery life** | 30 days @ 15 min reporting interval |
| **Opt. battery range** | 3.6V - 4.2V |
| **Accuracy** | ±0.2°C  (±0.4°F) |
| **Resolution** | 0.1°C (0.2°F) |
| **Interval** | **Standard:** 15 minutes (with probes connected) / once daily (with probes disconnected) **Optional:** 60 minutes |
| **Memory** | 7-day offline automatic re-capture 21-day offline manual re-capture (@15 min reporting interval) |
| **Radio technology** | **LoRa** Frequency: 915 MHz |
| **Country compatibility** | Canada, Mexico, United States |
| **Radio range** | >800 m line of sight to Relay |
| **Ingress protection** | Dust/Steam/Waterproof |
| **Dimensions** | 2.4" x 1.7" x 1.0" (63 x 42 x 25 mm) |
| **Weight** | 0.3 lbs  (152 g) |
| **Concrete Cover** | 2 - 3" (50.8 - 76.2 mm) |

# Temperature Probes

Temperature probes come pre-assembled, are rugged for construction activities, and are plug-and-play. The temperature sensitive end of the probe is installed at the point where temperature readings are required. The other end is plugged into the wireless logger via a waterproof connector.  Flexible wire allows for fast and easy installation in various construction environments and around congested areas in formwork. They can provide maturity-strength readings for calibrated concrete mixes.

# Temperature Probes

Flex probes
**SKU: EX-FTP-###**

Gen 1 probes
**SKU: EX-TP-###**

Adapter to accept Gen1 probes on Flex Loggers
**SKU: EX-FPA-1**

Flex humidity sensor
**SKU: EX-FRH-1**

Adapter to accept Flex probes on Gen1 Pro Loggers
**SKU: EX-LPA-1**

## Features

- Individually calibrated and tested to specifications
- Waterproof connector
- Electrically insulated and unaffected by contact with rebar
- Quick ship on all standard and most special lengths
- Custom lengths available upon request

## Applications

- Cast-in-place concrete & ambient monitoring
- Mass concrete thermal monitoring
- Precast mass concrete thermal monitoring
- Maturity monitoring

## Technical Specifications

| | |
|---|---|
| **Measurement Range** | -40°C to 120°C (-40°F to 250°F) |
| **Accuracy** | ±0.3°C (±0.5°F) |
| **Standard Lengths** | 2.5 / 5.0 / 10 /15 / 20 / 25 ft (0.8 / 1.5 / 3.0 / 4.6 / 6.1 / 7.6 m) |
| **Special Lengths** | 50 / 75 / 100 / 125 / 150 ft (15.2 / 22.9 / 30.5 / 38.1 / 45.7 m) |
| **Ingress Protection** | Dust/Steam/Waterproof |

# Match

Get the most accurate field cure cylinder results by wirelessly match curing your concrete cylinders to match the temperature of your concrete element, a preset curve or a fixed temperature.

| | EM2 | EM2 Mini | EM1 |
|---|---|---|---|
| Temperature Matching | Heat + Cool | Heat + Cool | Heat + Vent |
| Temperature Range | 5°C to 70°C (41°F to 158°F) | 5°C to 70°C (41°F to 158°F) | Ambient to 70°C (158°F) |
| Matching Accuracy | ±2°C (±4°F) | ±2°C (±4°F) | ±2°C (±4°F) |
| Communication | WiFi, LTE | WiFi, LTE | LTE |
| Remote Firmware Updates | Yes | Yes | Yes |
| 4"x8" Cylinder Capacity | 10 | 4 | 15 |
| Built-in Display | Yes | Yes | No |
| Portable | No | No | Yes |

CURING CHAMBER

# EXACT Match 2 & Mini

EXACT MATCH 2 & Mini accelerate construction schedules by providing accurate and timely cylinder breaks. The chambers heat and cool your cylinders to the same temperature as your curing concrete, or test data. They are designed to go in a testing lab, and multiple can be stacked and setup side by side to save space. The built-in display shows temperature, strength, estimated strength/target time as well as the project, product and location of the concrete you are matching.

**SKU: EX-EM-2 / EX-EM-2M**
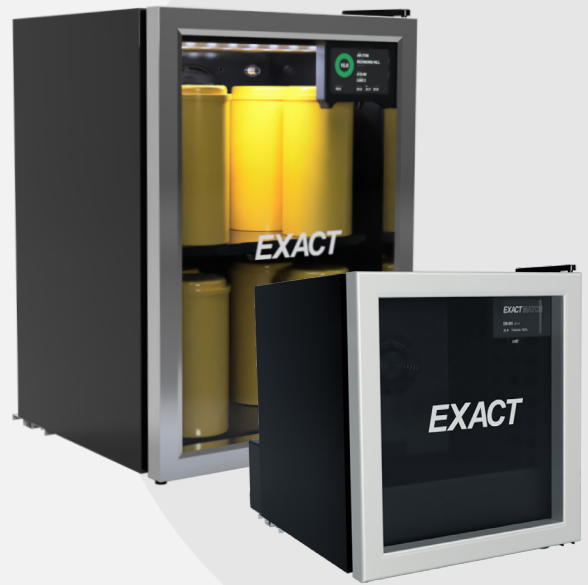
## Features

- Real-time, wireless temperature matching through the EXACT Portal with easy to use web interface
- Temperature matching to probes, fixed temperature or a user defined table
- Heating and active cooling
- Online, cloud access, control and monitoring
- Built-in LCD display

## Applications

- Concrete research and testing
- Accelerated curing and stripping
- Maturity calibration and verification

## Project References

- Lafarge
- CBM/St. Mary's
- Multiple precasters (available upon request)

## Technical Specifications

| | |
|---|---|
| Environmental Operating Range | 5°C to 35°C (40°F to 95°F) |
| Capacity | EM2: 10 of 4 x 8" cylinders (10.1 x 20.3 cm)<br>EM2 Mini: 4 of 4 x 8" cylinders (10.1 x 20.3 cm) |
| Curing Temperature | EM2: 5°C to 70°C (40°F to 158°F)<br>EM2 Mini: 2°C to 70°C (35.6 °F to 158°F) |
| Sensing Accuracy | ±0.5°C (±0.9°F) |
| Average Matching Accuracy | ±2°C (±4°F) typical |
| External Dimensions | EM2: 21.2" long x 17.9" wide x 26.3" high (53.5cm x 45.5cm x 66.8cm)<br>EM2 Mini: 21.2" long x 17.5" wide x 19.3" high (53.5cm x 44.5cm x 49.0cm) |
| Internal Dimensions | EM2: 9" long x 13" wide x 22" high (23 x 33 x 55.9 cm)<br>EM2 Mini: 9" long x 12.5" wide x 16" high (23 x 31.8 x 40.6 cm) |
| Weight | EM2: 64 lbs (29.0 kg)<br>EM2 Mini: 52 lbs (23.5 kg) |
| Voltage | 120 VAC, 60Hz |
| Current | EM2: 10 A (peak) / 5.8 (continuous)<br>EM2 Mini: 6 A (peak) / 3 (continuous) |
| LTE | 3GPP Release 13 LTE Cat M1 (Cat M1 bands: 2, 3, 4, 5, 8, 12, 13, 20, 28)<br>LTE Power Class: 23 dBm |
| WiFi | Frequency: 2.4 GHz<br>Output Power: 20 dBm |

PORTABLE CURING BOX

# EXACT Match 1

EXACT MATCH accelerates construction schedules by providing accurate and timely cylinder breaks. The chamber keeps your cylinders at the exact temperature as the concrete on-site. It is portable so that the chamber can be on-site for the first 24-hours, then transported to a lab for breaks and further curing.

SKU: EX-1 / EX-EM-1-AUS / EX-EM-1-EU



## Features

- Real-time, wireless temperature matching through the EXACT Portal with easy to use web interface
- Temperature matching to probes, fixed temperature or a user defined table
- Heating and venting
- Online, cloud access, control and monitoring

## Applications

- Concrete research and testing
- Accelerated curing and stripping
- Accelerated crane erection
- Maturity calibration and verification

## Project References

- Dufferin/CRH
- CBM/St. Mary's
- EllisDon Construction Sciences
- Crosslinx Eglinton LRT, Toronto
- CIBC Square, Toronto

## Technical Specifications

| | |
|---|---|
| Environmental Operating Range | -20°C to 50°C (-4°F to 122°F) |
| Capacity | 15 cylinders @ 4 x 8" (10.1 x 20.3 cm), 6 cylinders @ 6 x 12" (15.2 x 30.4 cm) |
| Curing Temperature | Ambient to 70°C (158°F) |
| Sensing Accuracy | ±1.0°C  (±2°F) |
| Average Matching Accuracy | ±2°C (±4°F) typical |
| External Dimensions | 37" long x 19.5" wide x 18.75" high (94 x 49.5 x 47.6 cm) |
| Internal Dimensions | 26" long x 15" wide x 12.25" high (66 x 38.1 x 31.1 cm) |
| Weight | 34 lbs (15.4 kg) |
| Voltage | 120 VAC, 60Hz |
| Current | 10 A (peak) / 5.8 (continuous) |
| LTE | North America:  3GPP Release 13 LTE Cat M1 (Cat M1 bands: 2, 3, 4, 5, 8, 12, 13, 20, 28) International: 3GPP E-UTRA Release 13 LTE Cat 1 (Cat 1 bands: 1,3,7,8,20,28A) LTE Power Class: 23 dBm |

# Software

Keep products within spec and eliminate rejections with reliable, real-time concrete monitoring. We collect your critical concrete monitoring data in real-time. We organize it, analyze it and report it so that you can make intelligent, data driven decisions to advance your business.

# Online Portal

Real-time, online monitoring, alerts and reporting accessible from any computer or mobile device. Works with all EXACT loggers and sensors.
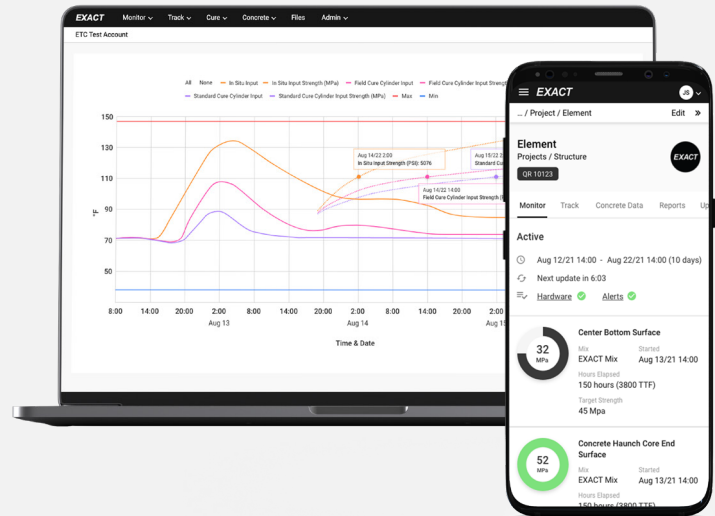


## Features

- Intuitive user interface
- Temperature, maturity graphs
- Automatic differential graphing for mass concrete
- Alerts via email or text message
- Customizable report templates
- Online concrete curing control system
- QR Code labels + GPS location
- Real-time inventory
- Production scheduling + tracking
- Digital dimensional checks
- Customizable quality inspection task lists
- Concrete property tracking
- Industry leading security and encryption

## Alerts

- Max temperature
- Min temperature
- Differential increasing
- Differential decreasing
- Rate of increase
- Rate of decrease
- Maturity / psi reached
- Peak detected
- Concrete detected
- Probe cut
- Sensor status

# Track

Digital production and quality tracking solution designed to adapt to your work-flow to produce the highest quality products, simplify reporting and give management a real-time overview on key performance indicators.

# Appendix

## Flex - Supported Countries

| Country | Operator |
| --- | --- |
| Australia | Telstra |
| Austria | A1, T-Mobile Austria GmbH |
| Belgium | Orange Belgium NV/SA |
| Canada | Bell Mobility Inc., Rogers Wireless |
| China | China Telecom |
| Croatia | Hrvatski Telekom d.d. |
| Czech Republic | T-Mobile Czech Republic |
| Denmark | Telia Danmark, Telenor A/S |
| Estonia | Telia Eesti |
| Finland | DNA Ltd, Telia |
| France | Orange France |
| Germany | Deutsche Telekom AG (T-Mobile), Vodafone, O2 / Telefónica Germany |
| Greece | Cosmote |
| Hungary | T-Mobile |
| Japan | KDDI, SoftBank |
| Korea | KT Corporation |
| Latvia | Latvijas Mobilais Telefons SIA |
| Luxembourg | Post Luxembourg |
| Mexico | Radiomovil Dipsa (Telcel) |
| Netherlands | Vodafone Libertel N.V., KPN B.V., T-Mobile Netherlands |
| Norway | Telenor Norge AS, Telia Norge AS |
| Romania | Orange |
| Slovakia | Telekom (T-Mobile), A1 Slovenija d.d. |
| Spain | Orange, Telefonica / Movistar |
| Sweden | Telia Sverige AB, Tele2 AB Sweden, Telenor Sverige AB |
| Switzerland | Swisscom Mobile Ltd. |
| Taiwan | Chungwa Telecom LDM Taiwan |
| United States | AT&T, T-Mobile |

# IC Statement

Industry Canada ICES-003Compliance: CAN ICES-3(B)/NMB-3(B)

- English:

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation,
Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following
two conditions:

(1) This device may not cause interference.

(2) This device must accept any interference, including interference that may cause undesired operation of
the device.

RF Exposure Information (MPE)

This device has been tested and meets applicable limits for Radio Frequency (RF) exposure.

The device can be used in portable exposure condition without restriction.

This equipment should be installed and operated with minimum distance 20 cm between the radiator &
your body.

- French:

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innova-
tion, Sciences et Développement économique Canada applicables aux  appareils radio exempts de licence.
L'exploitation est autorisée aux deux conditions
suivantes :

1) L'appareil ne doit pas produire de brouillage;

2) L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est
susceptible d'en compromettre le fonctionnement.

Informations d'exposition RF (MPE)

Cet appareil a été testé et répond aux limites applicables en matière d'exposition aux
radiofréquences (RF).

L'appareil peut être utilisé sans restriction dans des conditions d'exposition portables.

Cet équipement doit être installé et utilisé avec une distance minimale de 20 cm entre le
radiateur et votre corps.

# *EXACT*

**EXACT Technology**

hello@exacttechnology.com

**Canada + International:** +1-647-812-0248

**USA:** +1-302-485-0810