
eBurst™
Enabling Interbody Communication Standards for Digital Health Platforms
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etectRx, Inc

Did you take your medication?

etectRx™ is using
ingestible sensors
to address one of the largest problems in healthcare.

125,000 avoidable deaths annually

$300 Billion in annual avoidable US healthcare costs

Internet of Medical Things

An Unmet Need

- ***Large & Growing Global Health Sensor Market*** *projected to reach $142 B by 2030 at 18.53% CAGR*[1]
- ***Bluetooth LE has limited use in-vivo****, but has become the de facto technology for sensors worn outside the body*
- ***No platform exists to enable interoperable sensors inside the body***
- ***Biocompatible, low cost ICs, antennas, and power supplies are needed*** *to enable an interoperable "internet of medical things"*

[1]Health Sensors Market Size to Hit $142.18B Billion by 2030, Grand View Research, Inc., Sep 05, 2022
https://www.prnewswire.com/news-releases/health-sensors-market-size-to-hit-142-18-billion-by-2030-grand-view-research-inc-301617693.html

eBurst™

Ingestible Sensor Platform

Optimized for reliable transport of messages from sensors located deep in the body:

- *Extremely low power*
- *Very low-cost implementation*
- *Low data rate/event-based communications*
- *Proven safe and effective for in-body use*

Remotely Therapy Monitoring using ID-Cap™

1

The physician assesses the benefit of remote therapy monitoring

- *Informs the patient of benefits/risks*
- *Patient consents*
- *Physician prescribes ID-Cap along with the patient's medication*

2

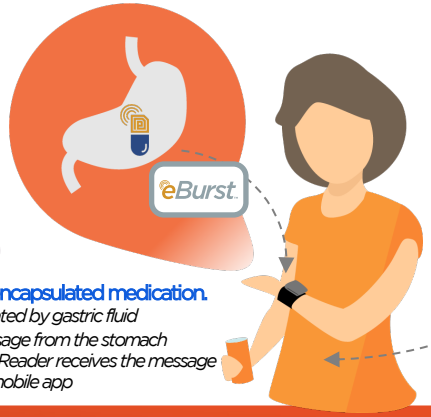
The pharmacy encapsulates the medication as prescribed.

- *Delivers the prescribed medication and reader to the patient.*

3

The patient takes the encapsulated medication.

- *The ID-Capsule is activated by gastric fluid*
- *Transmits a digital message from the stomach*
- *The wrist-worn ID-Cap Reader receives the message and forwards it to the mobile app*



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ID-Cap App

- *Forwards ingestion events and Reader status events to etectRx servers*
- *Reports and displays ingestion event history*
- *Displays reminder or confirmation messages*
- *Allows user to enter ingestion event manually*
- *Provides updates on status of Reader*
- *Available for iOS and Android*

Secure encrypted WiFi/Cellular

5

etectRx Servers

- *Secure Cloud-based Storage*
- *Patient's Ingestion Log*
- *Reader status reports*
- *HIPPA Compliant*

Secure encrypted WiFi/Cellular

6

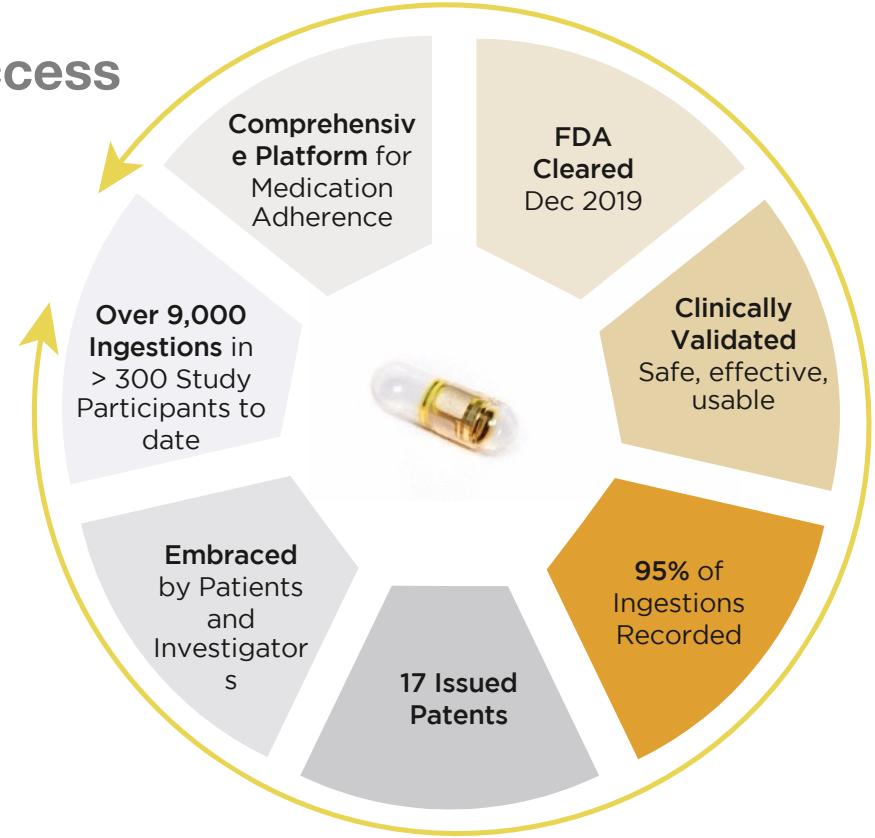
Physician's office remotely monitors patient therapy using the ID-Cap Dashboard

- *Real time reporting of ingestion events*
- *Alerts to missed events*
- *Automatic reminder messages to reduce missed doses*
- *Confirmation messages in response to ingestions*
- *View of individual patients or groups*
- *Practice bills for RTM services*

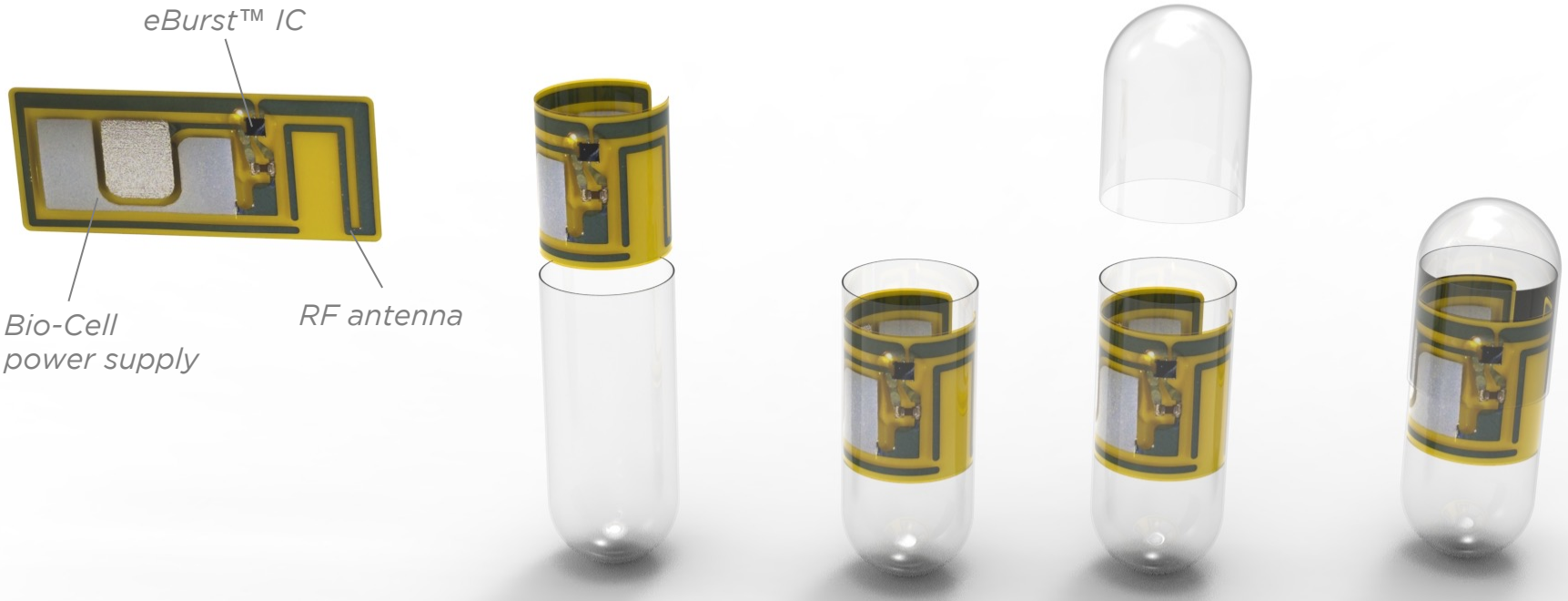
ID-Cap System

Strong Track Record and Ongoing Success

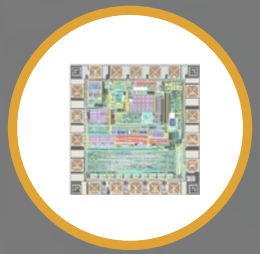
> This technology has been a game-changer, because we now have unequivocal proof of medication ingestion by the patient and can make the right correlation of adherence to drug concentrations in our studies."
>
> *-Dr. Jose Castillo-Mancilla, MD, Univ. of Colorado Denver*



ID-Tag™ with eBurst™

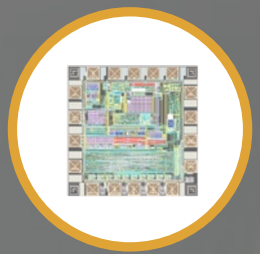


eBurst™ In-Body Integrated Circuits



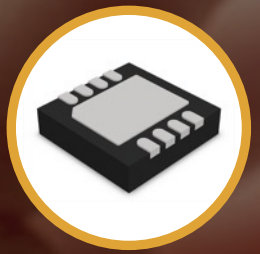
Tag IC ET10001.52

Single dose ingestible event marker IC.
Status: Production/Shipping



Tag IC ET10001.60

Multi-dose ingestible event marker IC.
Status: Production Qualified



eBurst Link IC ET10011.70

In-Body Communications Controller IC
Status: Planned

Ingestible event marker IC's are the most highly integrated application specific eBurst™ in-body components. Both of these IC's provide all of the active circuitry needed for self-powered ingestible event markers.

Developed to provide a communications link for ingestible and implantable sensors. Provides a general purpose serial interface to the target sensor or microcontroller.

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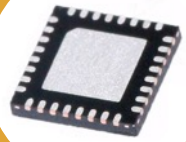
eBurst™ Features

Feature	eBurst™	Benefit
Data Rate	160bps	Sufficient for 10 samples per second at 16-bit resolution. Covers many physiological parameters.
Sensor Power Consumption	Average operating power <80 µW, wide operating voltage range.	Flexible sensor power options – self, external or battery powered.
Safety	Meets or exceeds all EN60601 safety requirements as required by FDA for ingestible event markers.	Safe for in-body use.
Range	Typically ~ 1m from body. May be extended or reduced through implementation options.	Flexibility in placement of reading devices. Does not require skin contact to receive messages.
Integration	ID-Tag < 20 mm^3 including IC, antenna, power source and substrate.	Enables very small sensors required for ingestion or implantation.
Topology	Hub-spoke network, one-way and two-way communications.	Flexible, multi-sensor applications with a single reader.

eBurst™ Reader Options



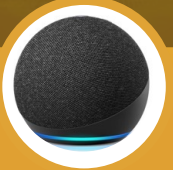
ET17001.00
Dual Channel eBurst™ Receiver IC
Status: *Engineering Samples Available*

Rx band: *284-320 MHz*
V_{DD}: *3.3 V*
I_{DD}: *35 mA max, <50 uA sleep*
Process: *180nm CMOS*
Package: *64 Lead 9x9mm MLP*

Highly integrated – enables many form factors
Minimal External Components

Wearable

Mobile



Health Hub

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eBurst™ Application Examples

We can support your IoMT development needs.

Environment	Application
Ingestible	Ingestible event marker Digital Medication Temperature sensor Endoscopy pH sensor Motility sensor Microbiome sensor Gas sensor Bioelectronic medicines Medication dispensing device
Implantable	Cardiovascular Glucose Neurological Intracochlear Orthopedic Genito-urinary
Other	Smart Pen Needle Smart Cartridge/Pre-Filled Syringe body Pharmaceutical Track & Trace Smart Bandages & Wound Care Incontinence / Smart Diaper Fluid levels

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