Trust Anchor

R&C®

Onboarding Industries to Web3
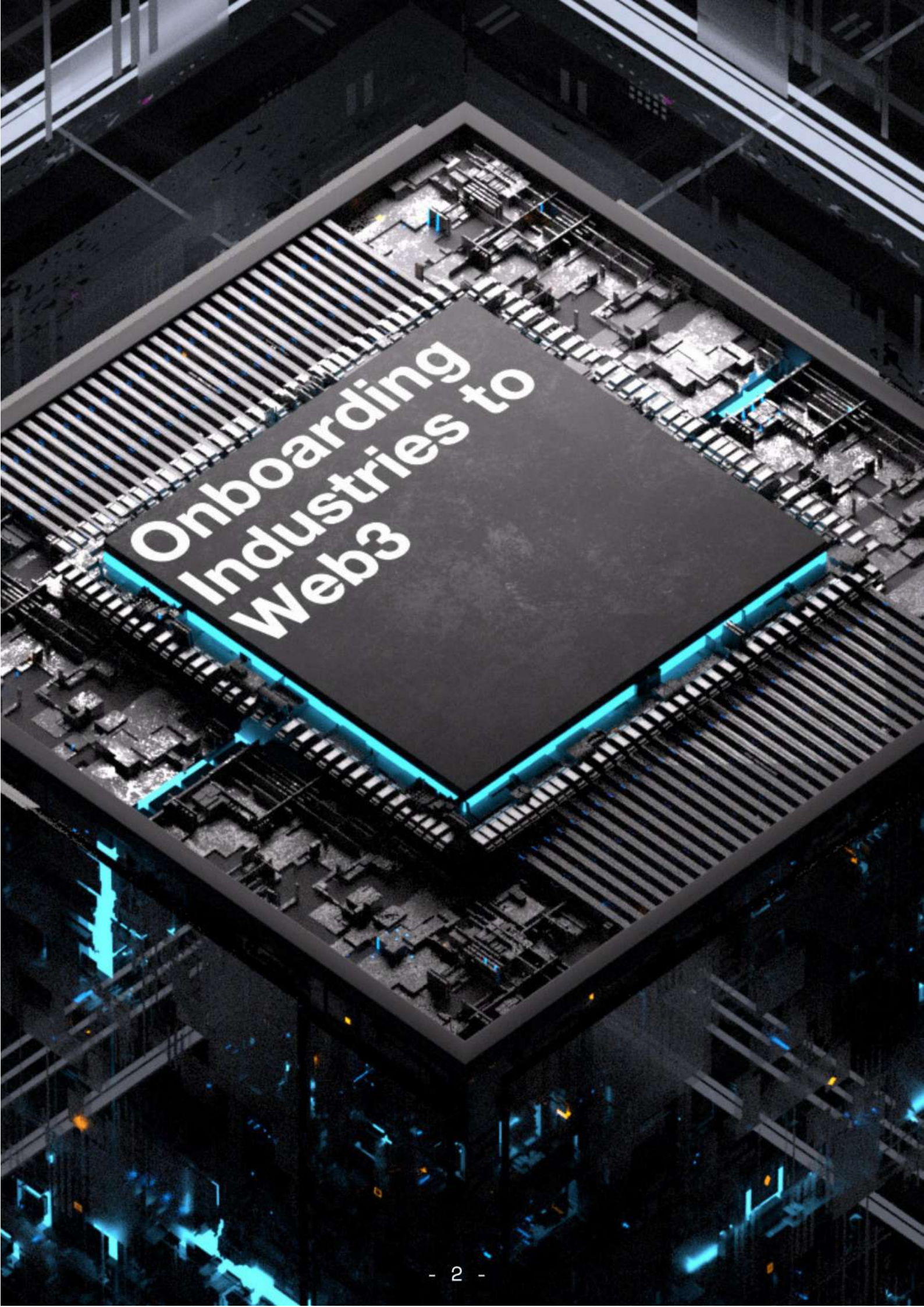
In short

With the rise of AI and distributed machines trustworthy data has become an exponentially growing challenge. Verification processes are insufficient, insecure and require third party support. Blockchain technology and Trust Anchors provide fast, direct, peer-to-peer solutions.

Blockchain technology overcomes the problem of needing a third party, while the Trust Anchor addresses the issue of data verification. It is a combination of hardware and software, linking the physical and the digital world.

With the implementation of the Trust Anchor, each machine receives a digital identity. At the same time, a tamper-proof fingerprint is assigned to the data produced by the machine. This ensures the origin, place and authenticity of the data minimizing lengthy verification processes and maximizing efficiency.

INTRODUCING
Trust Anchor

Watch Trust Anchor video here.

The Trust Anchor is a compact and sophisticated hardware device measuring 24.2x31.2x9.3 mm. It includes USB-C, Secure Element, Cryptographic Wallet, CPU, ample storage space, and CPIOS, all packed with cutting-edge technology.

This device is the cornerstone of the RDDL Network, providing unique digital identities for associated devices. It eliminates, solving the oracle problem and establishing a reliable and trusted data source. It seamlessly attaches to various machinery, effortlessly attesting raw data at the source.

Once linked to a machine, the Trust Anchor enhances communication through an open cryptographic protocol or direct interface if embedded. The accompanying service software, 0x21e8, and optional rddl-client simplify the connection to Planetmint, for metadata storage, and Liquid, the token creation platform. This ensures a user-friendly experience for setting up your desired business model.

Hardware Wallet

The Trust Anchor provides machines with an integrated hardware wallet, facilitating all necessary cryptographic functions. This allows machines to seamlessly engage in blockchain activities by safeguarding production data and signals intended for third-party exchanges. Through notarization, it ensures machine-to-machine value transfers and efficiently tokenizes machine production outputs.

Data Logger

The Trust Anchor diligently oversees a machine's productivity by capturing signals at specified intervals. This data can subsequently be transformed into tokens, which are minted following the parameters set by smart contract logic. Throughout this process, utmost security and confidentiality are maintained, encompassing data at rest, during computation, and in transit.

RF Module

The RF module furnishes the Trust Anchor (TA) with advanced connectivity features, empowering it to interface with the network and ledger. This connectivity fosters the TA's interaction within the expansive digital ecosystem. Consequently, this establishes a foundation for pioneering applications in Industry 4.0, IoT, supply chain logistics, proof of carbon offsets, material passports, and beyond.

BRING MACHINES TO BLOCKCHAIN

WE TO

NEED TALK

Paper-heavy processes for quality assurance, industry standards and regulatory compliance consume precious resources. They are subject to counterfeiting and harm the environment.

01

Parties have to rely on product authenticity and the quality of the provided data based on statements that are hard to verify or not verifiable at all.

02

Supply chain data may be altered or manipulated by any authorized or unauthorized party.

03

Auditing and compliance is an entirely manual process that is repeated periodically and subject to mistakes because it is conducted in hindsight.

04

Valuable data generated by production processes is mainly altered, ignored, lost or stuck in data silos.

05

Insufficient data quality and availability causes high opportunity costs for businesses while representing significant legal risk.

06
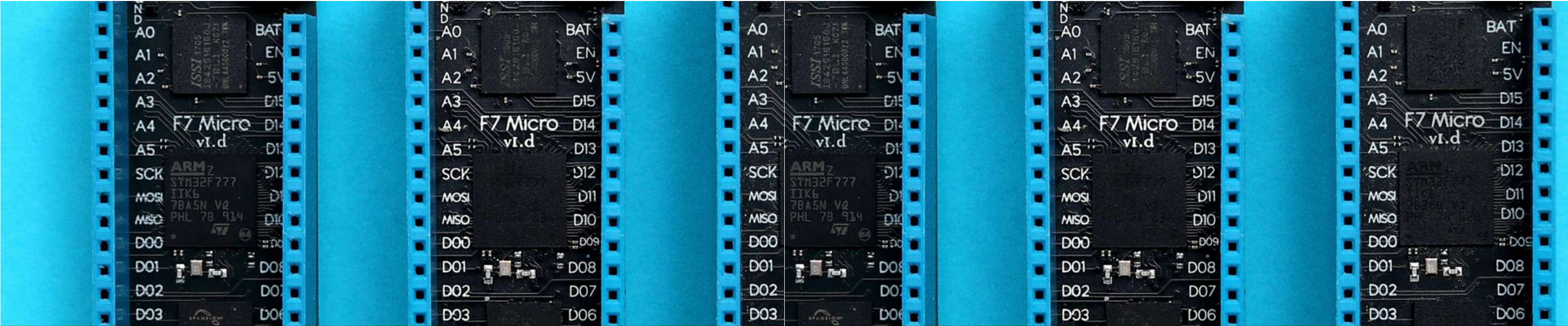
WHAT A TRUST ANCHOR CAN DO

> Eliminates paper dependency and establishes automated processes.

> Audits product data during production ensuring immediate compliance.

> Automatically records product authenticity in real-time.

> Facilitates trusted data monetization.

> Maintains information confidentiality and restricts access to authorized parties only.

The Trust Anchor endows a connected, intelligent machine with a unique identity. Individual fingerprints are assigned to the data generated by this machine and stored in a decentralized manner. This data can then be represented in value by way of tokenization. This process enables tamper-proof data, which can be accessed at any time through a blockchain solution by interested parties. Depending on their access rights, partners can access this same data. This method provides a 100% guarantee for the use trusted data certifications, such as 'green energy' certificates or proof of the content of a product. Hence, secure data transmission offers the opportunity to establish new business and incentive models represented by a token economy. This enables a completely new way of thinking for Industry 4.0.

HOW DOES IT WORK?

1. Connect the Trust Anchor and/or HW-03 device* to the machine.
2. Once connected, it will automatically trigger the Master Identity creation (Public and Private Key pair) representing the machine on the blockchain.
3. Machine/HW-03 device gathers productivity data and creates a unique fingerprint (CID) of this metadata using a hashing algorithm.
4. Trust Anchor creates a transaction on Planetmint, signing it with the machine's identity and storing the CID on Planetmint.
   a. the original notarised data is stored on cloud storage or on-premise storage, or distributed storage like IPFS. Other data storage solutions are also possible.
5. The productivity data of the machine can be verified through the "Resolver" service of RDDL Network comparing CIDs.

*HW-03 is a device designed and developed by Riddle&Code for specific industry needs. Besides the Trust Anchor inside it has additional components.
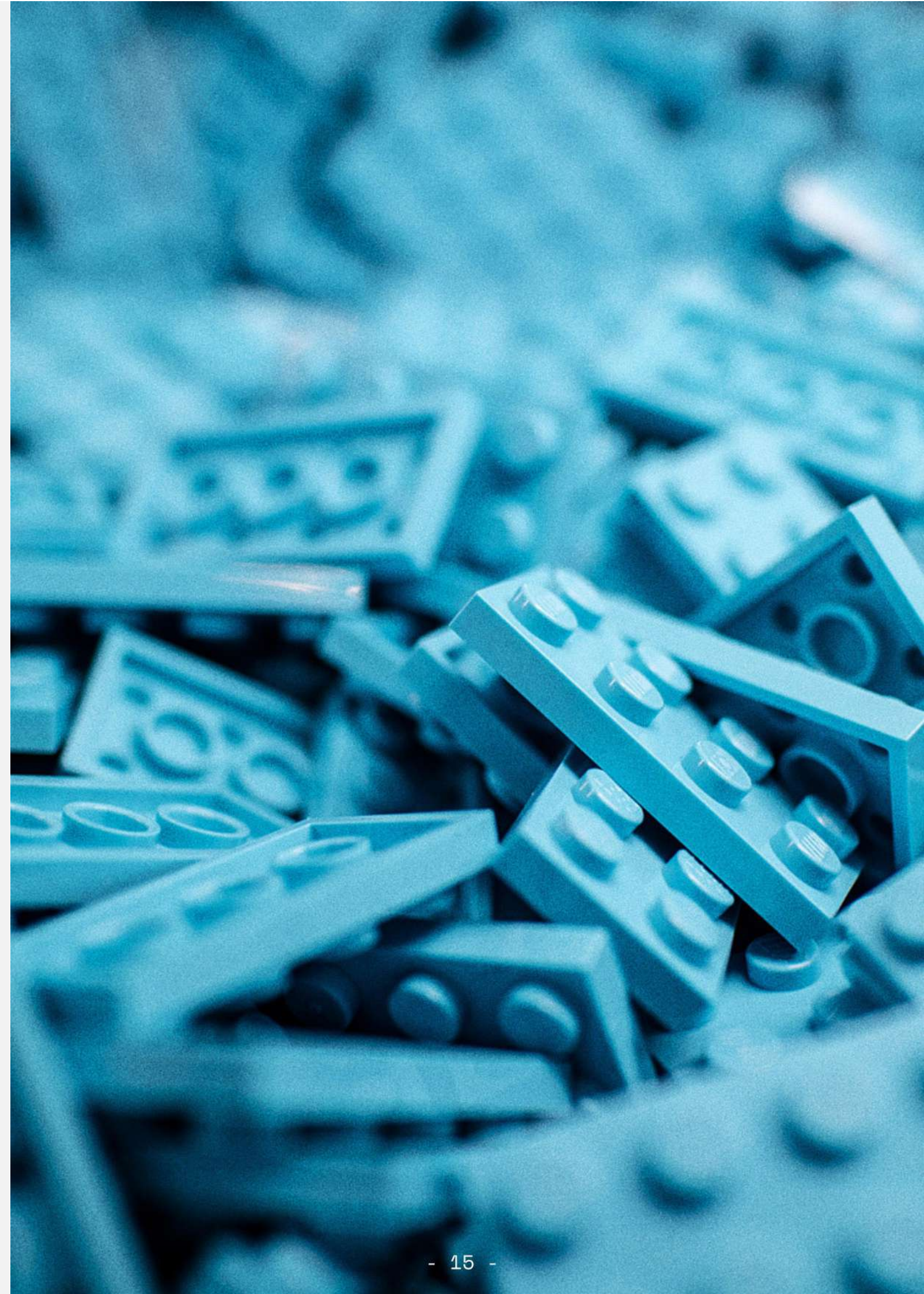
HW-03 Energy

Components:
1. Trust Anchor
2. RPI Zero
3. USB HUB
4. RF Module

Why is HW-03 Energy a great adition to your machine?

The HW-03 Energy has been specifically engineered for applications within the energy industry, presenting a range of attributes tailored to this sector:

- Compact Design: Its streamlined form factor ensures it occupies minimal space.
- Cost-Efficiency: Economical production processes make it a cost-effective choice.
- Versatile Connectivity: It boasts a plethora of connection options, both wireless, like LoRa, WiFi, and LTE, and wired variants. The connectivity choice is adaptable, contingent upon the specific application and the smart meter configuration in use, recognizing that different meters might utilize diverse data transmission methodologies.
- Modularity: Its design facilitates compatibility with a range of smart meters, ensuring integration is straightforward and efficient.
- Robust Computing Capabilities: Despite its compact size, it doesn't compromise on processing power.

The HW03-Energy stands out as an ideal solution for the majority of the energy sector's needs due to its adaptability, powerful performance, and low energy consumption. It aligns seamlessly with essential peripherals, ensuring it meets industry objectives. Furthermore, the HW-03 serves as the foundational compute unit, allowing for effortless expansion and integration with necessary extensions, solidifying its role as a pivotal component within any system configuration

HW-03 Industry

Components:
1. Trust Anchor
2. Battery pack
3. RF Module
4. Power Management
5. iMX8
6. Power Supply Unit
7. M-12 Connector
8. CAN Transeiver
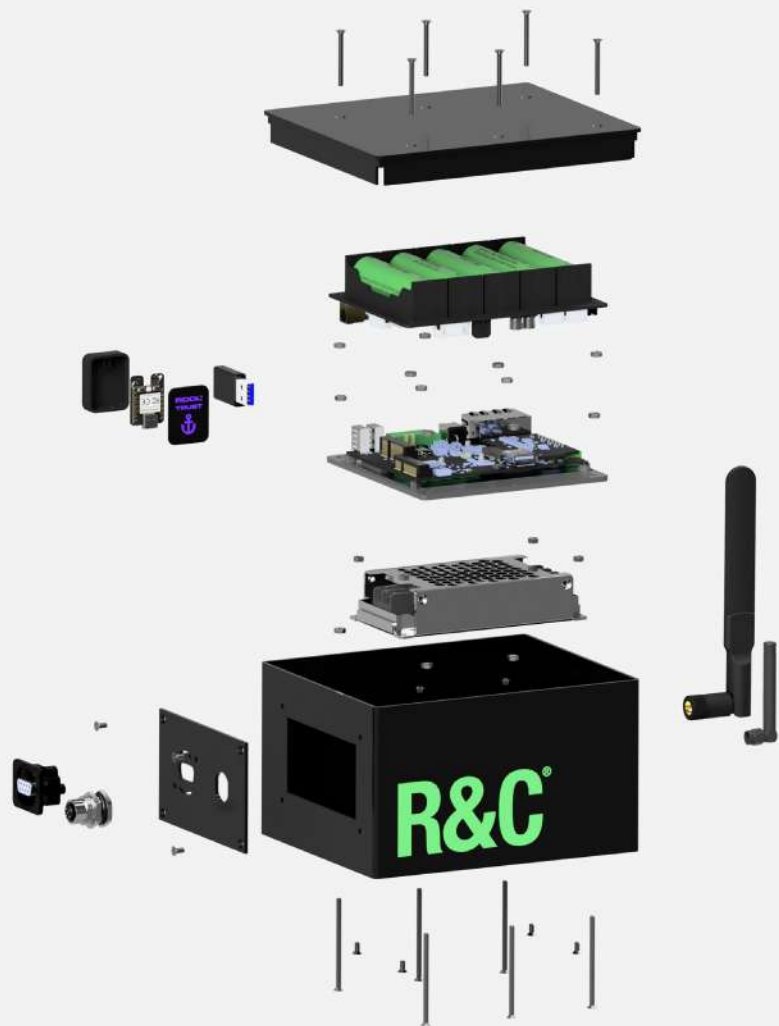
Why is HW-03 Industry a great addition to your industrial machine?

The HW-03 Industry is meticulously designed to offer a robust solution tailored for rigorous operations.

Unlike the HW-03 Energy variant, the HW-03 Industry is equipped with industrial-grade power management and supply systems, inclusive of a battery pack, ensuring seamless and consistent performance. Such features ensure that the HW-03 Industry operates reliably, even in the most demanding conditions.

Central to the HW-03 Industry is the IMX8 microcontroller unit (MCU), serving as its primary computing entity. While the IMX8 chip requires a slightly elevated energy input, it more than makes up for it with its outstanding processing capabilities.

In conclusion, the HW-03 Industry:

Boasts unparalleled durability, designed to endure challenging industrial scenarios.
Features an integrated uninterruptible power supply.
Provides remarkable computational prowess.

1. Connect the Trust Anchor and/or HW-03 device* to the machine.
2. Once connected it will automatically trigger the Master Identity creation (Public and Private Key pair) representing the machine on the blockchain.
3. Configure sub-identities for each machine and sub-addresses for each production run linked to the Master Identity.
4. Convert sub-addresses into short-form identifiers compliant with standards for each physical package in any form ie. Optical codes: DotCode, DataMatrix, NFC Tags.
5. Attach identifiers to packages by printing them with a laser printer or in NFC tag form during production.
6. The Trust Anchor gathers product metadata and creates a unique fingerprint (CID) of this metadata using a hashing algorithm.
7. Trust Anchor creates a transaction on Planetmint, signing it with the machine's identity and storing the CID on Planetmint.
   a. The original notarized data is stored via cloud storage, on-premise or distributed storage like IPFS.
8. Customers can scan optical codes or NFC tags to verify the related metadata to be in sync with the physical good at hand and access product data through the "Resolver" service for verification.

Industry example Track&Trace:
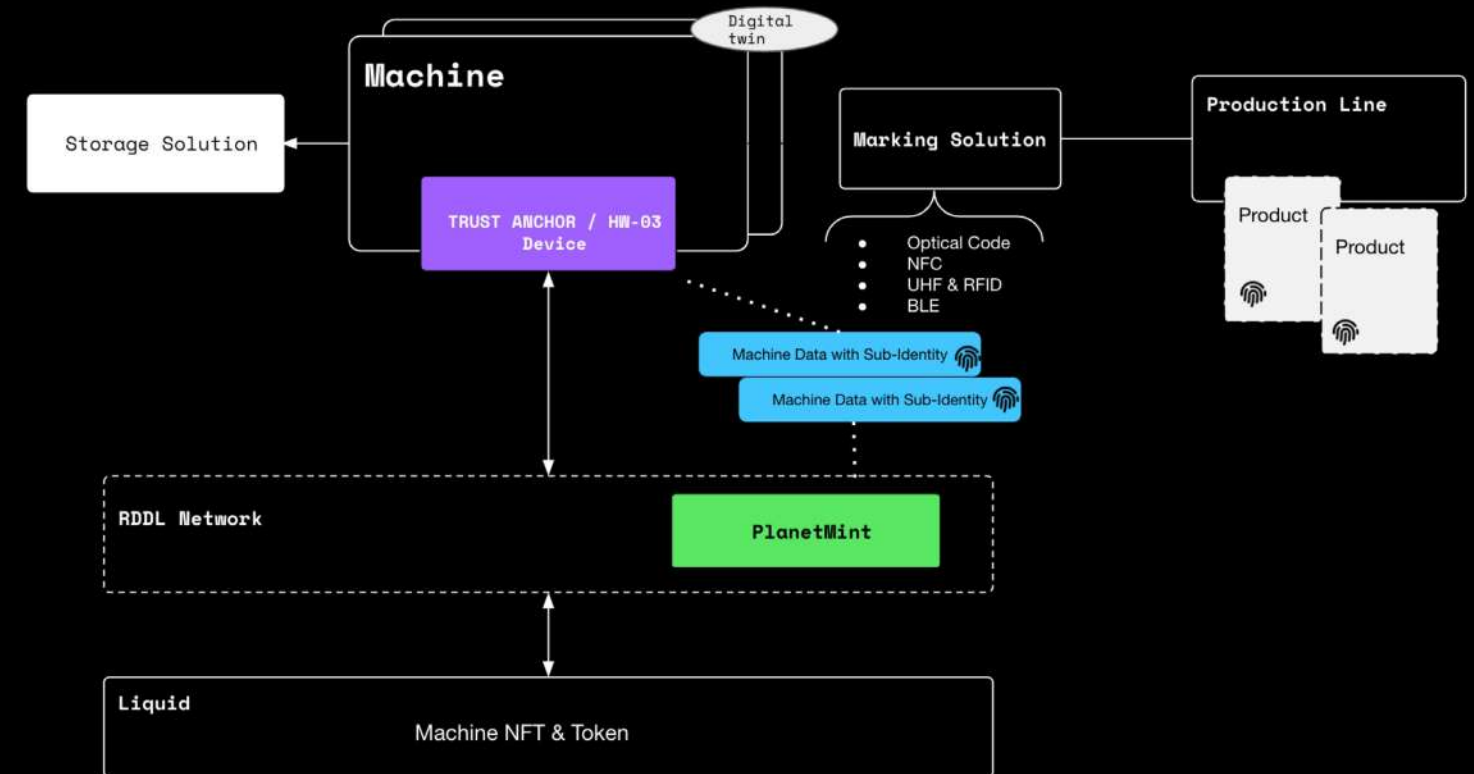
Learn more about Planetmint.

Technical Specifications

	HW-03 Energy	HW-03 Industry	Trust Anchor (C3)
Network Interfaces	Lora, WiFi, LTE-M, PoE	Can Bus, WiFi 802.11ax, LTE Modem	Wifi 2.4GHz IEEE 802.11b/g/n
Interfaces	USB, M-Bus, Modbus, IR, UART, SPI, I2C	USB, M-Bus, Modbus, IR, UART, SPI, I2C	USB type C, Wifi, BLE, SPI, I2C, UART
MCU - micro controller unit	Quad-Core 64-Bit Arm Cortex-A53 CPU	NXP i.MX8M-Mini CPU, quad-core Cortex-A53	ESP32-C3 32-bit RISC-V chip
Main Application	Data Gateway & Edge Computing	Data Gateway & Edge computing	Data Oracle, Signing Device
Secure Elements	Trust Anchor	Trust Anchor OR AND SE050, Optiga Trust X	SE050, Optiga Trust X
Size (LxWxH) mm	70 x 36 x 32	162 x 132 x 96	30,8 x 22 x 9,3
Material casing	PLA	PLA	Resin
Memory	512 Mb LPDDR2	up to 4GB Ram	400KB of SRAM
Storage	up to 32GB	up to 128 eMMC	4MB on board Flash memory
Storage Type	Micro SD	eMMC	Flash memory
Operating System	Debian	Yocto	Embedded/Arduino

*Network interface can be adapted accoring to customer's requirements.
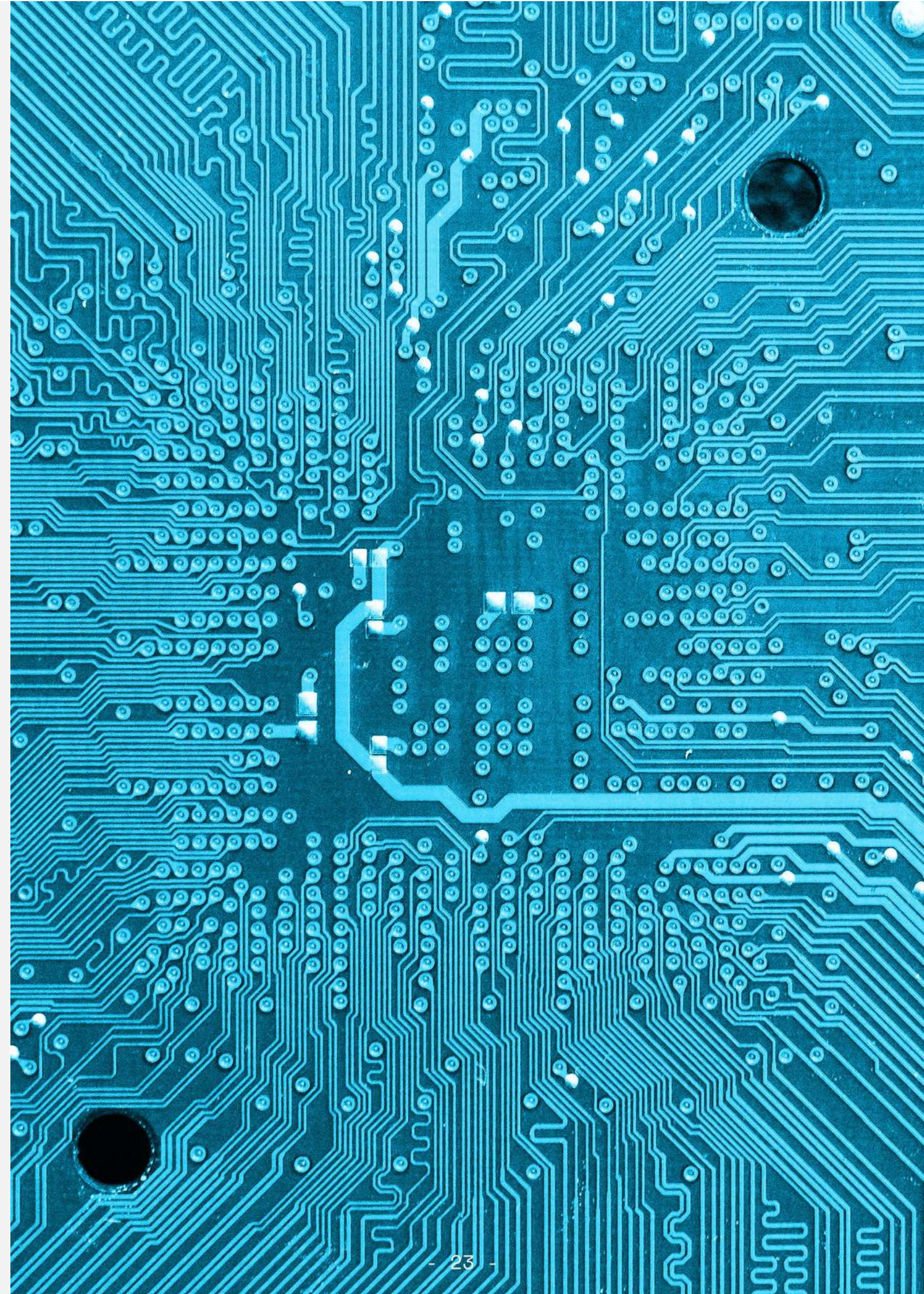
REACH OUT TO US ABOUT YOUR INTEGRATION AND SETUP POSSIBILITIES.

Schedule a Demo

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CEO
✉ in

Thomas Fürstner
Founder and CTO
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Kai Siefert
CPO
✉ in

Gianluca Graf
Head of Sales
✉ in

Dietmar Kofler
Community Director
✉ in

Christiane Rinke
Head of Marketing
✉ in

About us

Riddle&Code is a Vienna-based software company dedicated to onboarding industries to Web3 with innovative and sustainable solutions. Trust, security, and transparency are at the core of their philosophy, which is why they utilized the power of the Trust Anchor.

Trust Anchor is a solution by **RDDL** Foundation which serves as a pivotal bridge between physical smart machines and the digital economy. As Riddle&Code enters a new era of Web3, the company evolved into a product-led service company, building on top of the **RDDL** Network.

Learn more about RDDL.

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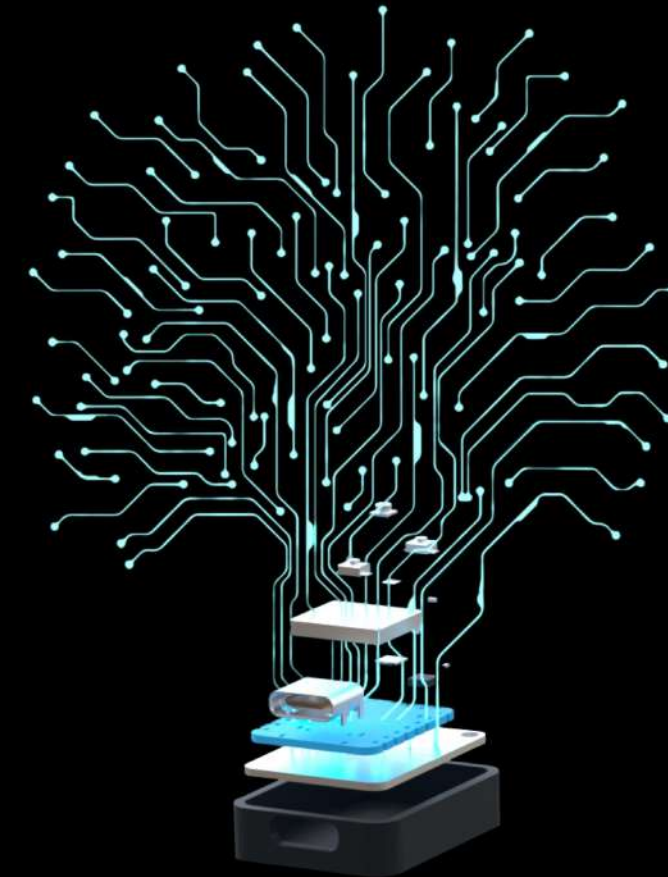
+43 1 2051907139
office@riddleandcode.com

Riddle & Code GmbH
c/o Spaces Icon Central Station
Gertrude-Fröhlich-Sandner-Straße 2-4/Tower 9
1100 Vienna
Austria, Europe