Cavli Wireless

Corporate Presentation

March 2023

Re-Imagining Cellular IoT Solutions

About Cavli

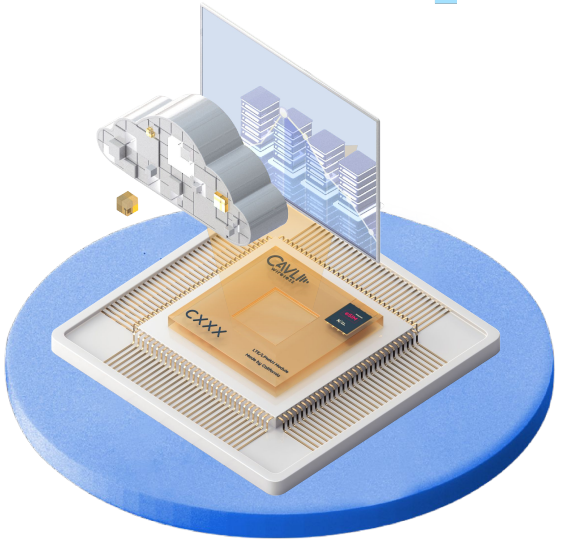
Cavli Wireless designs and manufactures cellular IoT modules with integrated eSIM and global connectivity powered by Cavli Hubble platform.

We deliver

- ➔ Cellular Module for 5G, LTE CAT1/4/6, NB-IoT, LTE-M technologies
- ➔ IoT connectivity and device management platform

Discover

100+ Employees	**60%** R&D Resources
5Mn+ Units Pipeline booking for 2023	**4Mn** Current annual production capacity
40TB Data per Month	**20Bn** MQTT Messages per month



Cavli Hubble Platform

Connectivity & Device management platform that makes Connectivity over Cellular, seamless, secure & cost effective

Current Geographical Presence

Headquartered in US with Operations in India & Spain. All of Cavli modules are designed and manufactured from the facility in Kochi, India.

Headquarter - California, USA

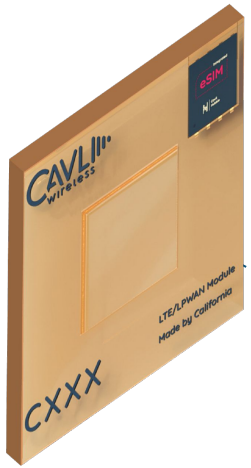
Sales presence - India, Spain, Turkey, UK, France, Germany, Italy

Research & Development – India, Vietnam

Manufacturing & Warehousing - India, Hong Kong

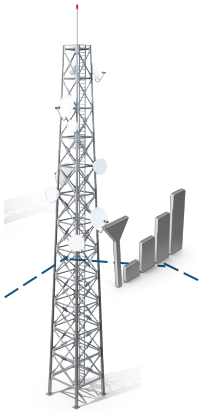
Cavli Value Proposition

Cavli Wireless brings together the three basic building blocks of IoT connectivity enablement, required to build & scale IoT deployments and products across geographies in the most seamless & cost effective manner possible.



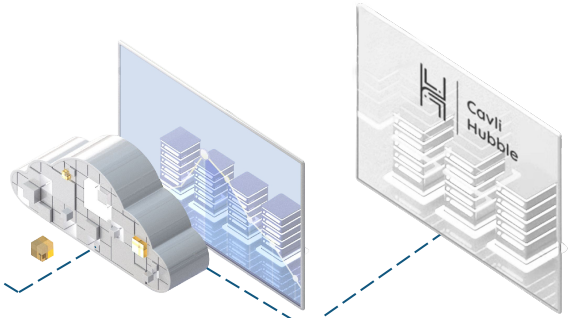
Cavli C Series

Cellular IoT modules



LTE-M NB-IoT 2G 3G 4G 5G

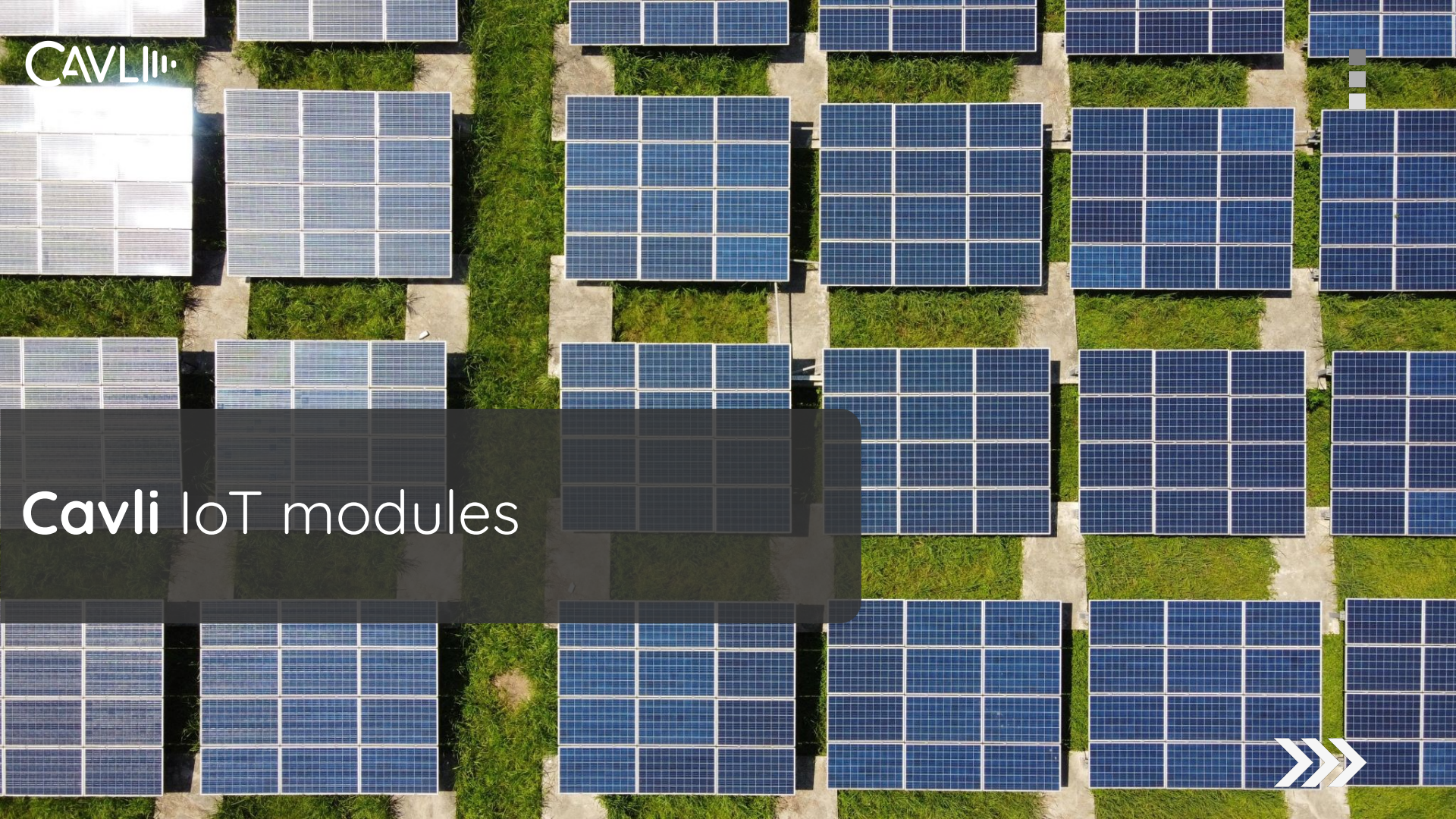
IoT connectivity with integrated eSIM



Cavli Hubble

Hubble Device and connectivity management platform

The complete IoT enablement package from smart modules to network access & connectivity management platform



Cavli IoT modules

Cavli Module Portfolio/Roadmap

Technology/ Focus	In Production	Q1 2023	Q2 2023	Q3 2023	Q4 2023
IoT/M2M	C10GS C120GS	C16QS	C10QM C10QS	-	-
LPWAN	C42GM	-	-	C41QS C42QM	-
Automotive	-	-	CQS290 C10QMA	-	-
5G/Telecom	-	-	-	CQM220	CQM200 CQM490

In production

Autograde

IoT/ M2M

C16QS

- LTE CAT 1 bis module compliant with 3GPP release 14
- ARM Cortex M3 processor: 204 MHz clock
- 4MB Flash + 1.25MB RAM
- Multi Constellation Support for GNSS
- 26.5 x 22.5 x 2.3 mm, LGA FF
- Ultra low power consumption
- Pin compatible with C42GM, C42QM

C10GS

- LTE CAT 1/4 Module compliant with 3GPP release 10
- ARM-11 processor: 400MHZ clock:32 KB D-Cache:16KB Data TCM for each CPU (Dual-core CPU)
- 256MB Flash + 128MB RAM
- Linux 3.4/5.4 with OpenSDK Support
- Global Band support
- Multi Constellation Support for GNSS with 132 tracking channels & AGPS
- 37 x 21.8 x 2.8 mm, LGA FF, mPCIe
- Pin compatible with C10QM/C10QS

C10QM

- LTE CAT 1/2G Module compliant with 3GPP release 10
- ARM Cortex A7 processor: 1.3GHz clock
- 128MB Flash + 128MB RAM
- Linux OS (Kernel 3.18)
- Multi Constellation Support for GNSS
- 37 x 21.8 x 2.8 mm, LGA FF, mPCIe
- Pin compatible with C10GS

IoT/ M2M

C10QS

- LTE CAT 1 Module compliant with 3GPP release 10
- ARM Cortex A7 processor: 1.3GHz clock
- 128MB Flash + 128MB RAM
- Linux OS (Kernel 3.18)
- Multi Constellation Support for GNSS
- 37 x 21.8 x 2.8 mm, LGA FF, mPCIe
- Pin compatible with C10GS

C10QM-CAT4

- LTE CAT 4/2G Module compliant with 3GPP release 10 (150 MBps UL/50 MBps DL)
- ARM Cortex A7 processor: 1.3GHz clock
- 128MB Flash + 128MB RAM
- Linux OS (Kernel 3.18)
- Multi Constellation Support for GNSS
- 37 x 21.8 x 2.8 mm, LGA FF, mPCIe
- Pin compatible with C10GS

C120GS

- LTE CAT 6 based on 3GPP E-UTRAN Release 10 (Upgradable to Release 11)
- ARM Cortex A7 processor: 832MHz clock (Dual Core)
- 128MB Flash + 128MB RAM
- Linux OS
- M.2 Socket USB 3.0 (Type 3042-S1-B) Form Factor
- Dimension 42 x 30 x 2.6mm, M.2(Key-B)

LPWAN

C42GM

- LTE CAT M1/NB1/NB2 based on 3GPP E-UTRAN Release 14
- ARM Cortex R4 processor: 192MHz clock 32KB |-Cache 32 KB D-Cache: 64KB A-TCM: 2MB B-TCM
- 16/32MB Flash + 2MB RAM
- Zephyr RTOS
- Integrated GPS/BDS
- 26.5 x 22.5 x 2.3 mm, LGA FF
- Sigfox and CAN support

C41QS

- NB-IoT module compliant to 3GPP release 14
- ARM Cortex M3 - up to 204MHz
- 4MB RAM
- NB1/NB2, 2-HARQ
- Ultra low-power consumption under DRx, eDRx operating mode
- Compact form factor
- Integrated GPS/BDS

C42QM

- Cat M1, NB1/NB2/EGPRS compliant to 3GPP Release 14
- ARM Cortex-A7 CPU up to 800 MHz
- 64MB Flash + 32MB RAM
- Integrated GNSS
- 26.5 x 22.5 x 2.3 mm, LGA FF
- VoLTE support
- Fall back to 2G
- Pin compatible with C42GM and C16QS

Automotive

CQS290

- LTE CAT 4/2G, 3GPP Release 12
- Cortex A53 quad-core CPU 2GHz architecture with built-in Adreno 702 GPU 845MHz
- Android 12 + service packs up to android 15
- 2 GB LPDDR4X + 16 GB eMMC
  3 GB LPDDR4X + 64 GB eMMC
- Multi Constellation Support for GNSS
- Dimension 40*35 mm, LGA Package
- WiFi a/b/g/n/ac, Bluetooth 5.0

C10QMA

- Automotive grade LTE CAT4/2G module compliant with 3GPP release 10
- ARM Cortex A7 processor: 1.3GHz clock
- 128MB Flash + 128MB RAM
- Linux OS (Kernel 3.18)
- Multi Constellation Support for GNSS
- 37 x 21.8 x 2.8 mm, LGA FF, mPCIe
- IATF 16949:2016 quality management system
- Automotive quality processes such as APQP, PPAP, etc

5G

CQM220

- 5G RedCap compliant with 3GPP Release 17
- 220 Mbps peak DL 100 Mbps peak UL
- VoNR and VoLTE support
- Fall back to LTE CAT4
- Integrated L1+L5 GNSS
- LGA and M.2 FF

CQM200

- 5G Advanced FR1/FR2 module compliant with 3GPP release 17 and 18
- 10 Gbps peak DL/3Gbps peak UL
- VoNR and VoLTE support
- Fall back to LTE CAT 19
- Integrated L1 + L5 GNSS
- LGA and M.2 FF

CQM490

- 5G NR 3GPP Release 16 compliant
- Kyro Octa core CPU: Cortex 2*A78 6*A55
- Android 13 + service packs up to Android 17
- 3 GB LPDDR5X + 64 GB eMMC
- Multi Constellation Support for GNSS
- WiFi 5, WiFi 6, Bluetooth 5.2, Camera, Display, Video
- Ardeno 613 GPU


CAVLI
Cavli manufacturing

Manufacturing Overview

A snapshot of Cavli's manufacturing capabilities

500K
CPH

High Speed SMT line @ 500,000 cph rate which is upgradable

Anritsu envision:ensure
ROHDE&SCHWARZ

Industry approved test equipments for RF calibration

Automated chip firmware flashing machines

Custom designed job boards & software tools for production automation

4M

Current Manufacturing capacity
4 Million Modules/year

Made in India

Our modules are manufactured at ISO/ TS 16949 qualified sites in India


IoT connectivity and cloud

Cavli product suite - Integrated eSIM and connectivity

We work directly with Tier 1 Mobile Operators to provide connectivity via eSIM integrated modules. Our global connectivity offering enables us to address projects from almost any country in the world.

27	18	180+
NB-IoT	LTE-M	LTE/3G/2G
	Countries	

Deutsche Telekom · orange · vodafone · axiata · telenor · Jio · TURKCELL

2G · NB-IoT · LTE-M · GPS · 4G LTE · GNSS

- Industrial eSIMs integrated to module
- Partnerships with Tier 1 MNOs
- Flexible pricing/Pay-as-you-go (PAYG) plans
- Supports NB-IoT, LTE-M, 2G, 3G, 4G, 5G
- eSIM and data managed via cloud

Cavli product suite - Cavli Hubble Platform

Cavli Hubble Platform enables devices to get connected to the cloud from wide range of customer applications with connectivity mode extending from LPWAN like NB-IoT to LTE-M, LTE-CAT1/4, 5G and even legacy networks like 2G and 3G

Device Orchestration and Monitoring

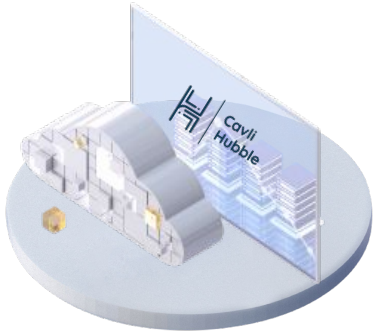
Intelligent remote eSIM provisioning

Application Data routing

Firmware Updates Over-the-Air

IoT Data Subscription management

Web Service API



Cavli Hubble

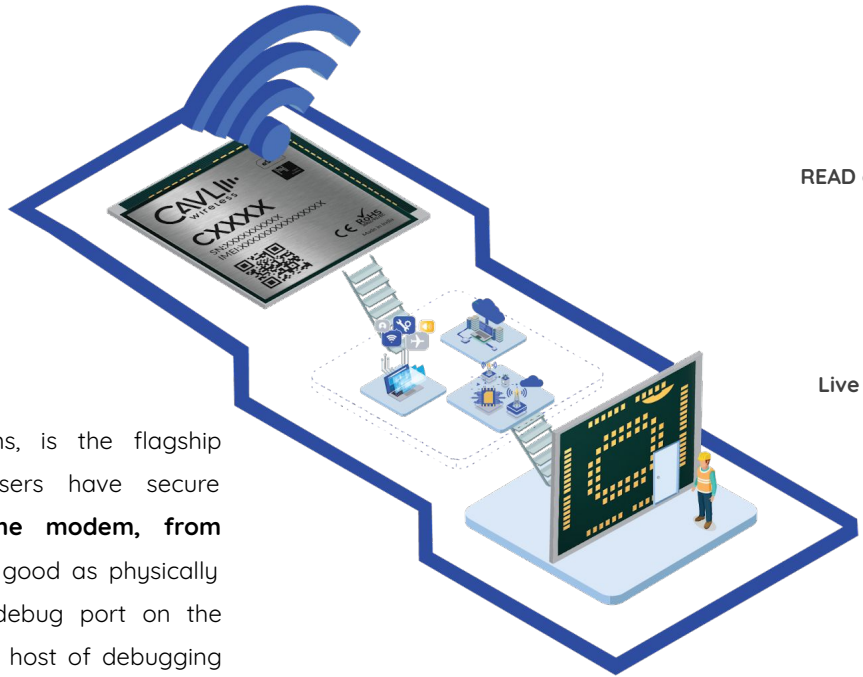
GSMA SGP02 v3.4 SAS accredited RSP platform.

Hubble Messaging Service

Hubble Connectors

Cavli Hubble Cloud Platform - Hubble Lens

Introducing Cavli Hubble Lens - Virtualizing the physical access to the modem



The Cavli Hubble Lens, is the flagship feature where the users have secure **remote access to the modem, from anywhere virtually**, as good as physically connecting into the debug port on the modem. This enables a host of debugging and configurations options to customers and developers.

READ and WRITE over 10+ critical parameters

OTA - AT Commands

Live / Historical AT Command Logs

Reboot when modem performance is slow

Switch operators on the fly

Diagnose the MCU code for bugs or faulty commands.

Thank You

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