Enabling the Internet of Things
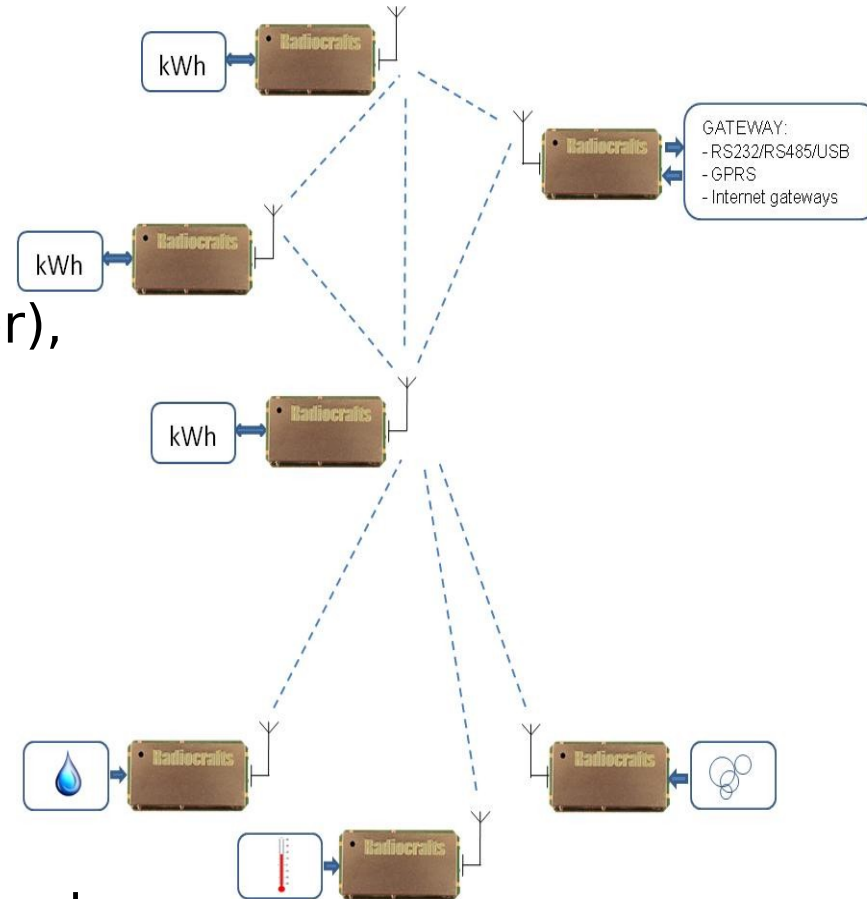
The TinyMesh protocol

Tinymesh

The TinyMesh protocol, embedded in the Radiocrafts module, is a high quality, reliable, secure and cost competitive wireless platform for industries requiring data collection or remote control of large numbers of clustered devices, such as energy meters, street lights, industrial or commercial sensors and actuators

Technical Highlights

- Self Forming, Self Healing Mesh, all networking control embedded in each module (no need for DCU)
- IEEE 802.15.4g PHY (physical layer), sub- 1 GHz standard
- AES 128 Data Security
- Remote Control and Monitoring
  - Serial data/UART streaming
  - Digital I/O
  - Analog Input
  - Dimmer Output (PWM)
- Transparent, direct wire replacement
- Tiny Solution Cloud Control

Long Range

The TinyMesh protocol is available for a wide range of RF frequencies and output powers, all in the same hardware footprint.
High Power, 500mW output power modules, operating in the Indian license free 865MHz band, provide reliable communication ranges of several hundred meters in city areas, and plus 1km range with optimum antenna placement and free line of sight.

FIELD PROVEN IN 200k NODES (INDIA)
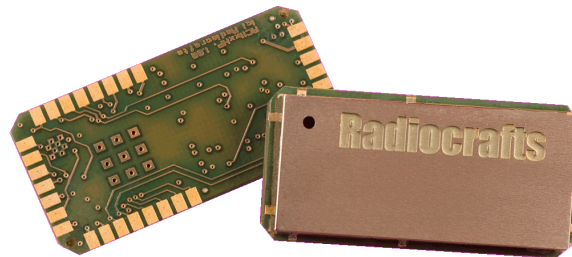
Reliable Connection

Tinymesh

The TinyMesh protocol employs a range of proven means and proprietary features to deliver ultra secure and reliable communication under any condition.

- Automatic, redundant packet routing for reliable connection
- Listen Before Talk, Collision Detection, Collision Avoidance, Checksum Control, Packet Acknowledge and Packet Retransmission for reliable data delivery.

-AES 128 encryption and authentication for security and data integrity

-Packet identification, Command Acknowledge and Streaming Data packet numbering for reliable system design

- RF Tamper Detect, Clustered Node Detection and Alternate System Detection for ultimate system reliability under harsh and hostile conditions

One module, many functions

Tinymesh

A TinyMesh module may be configured to function as a Gateway / Coordinator Device, or as a fully functional Router Device.
A fully functional data collection or remote control system may be designed without expensive supporting hardware or MCU, as every module has full Router and Gateway capabilities.

Enabling the Internet of Things
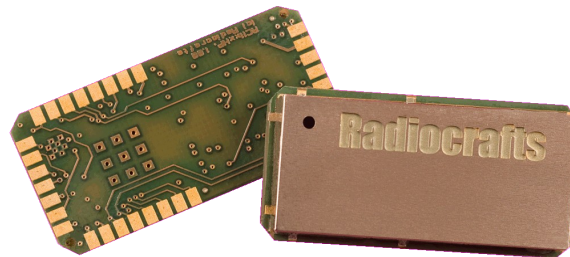
Mains / DG Detecion

Tinymesh
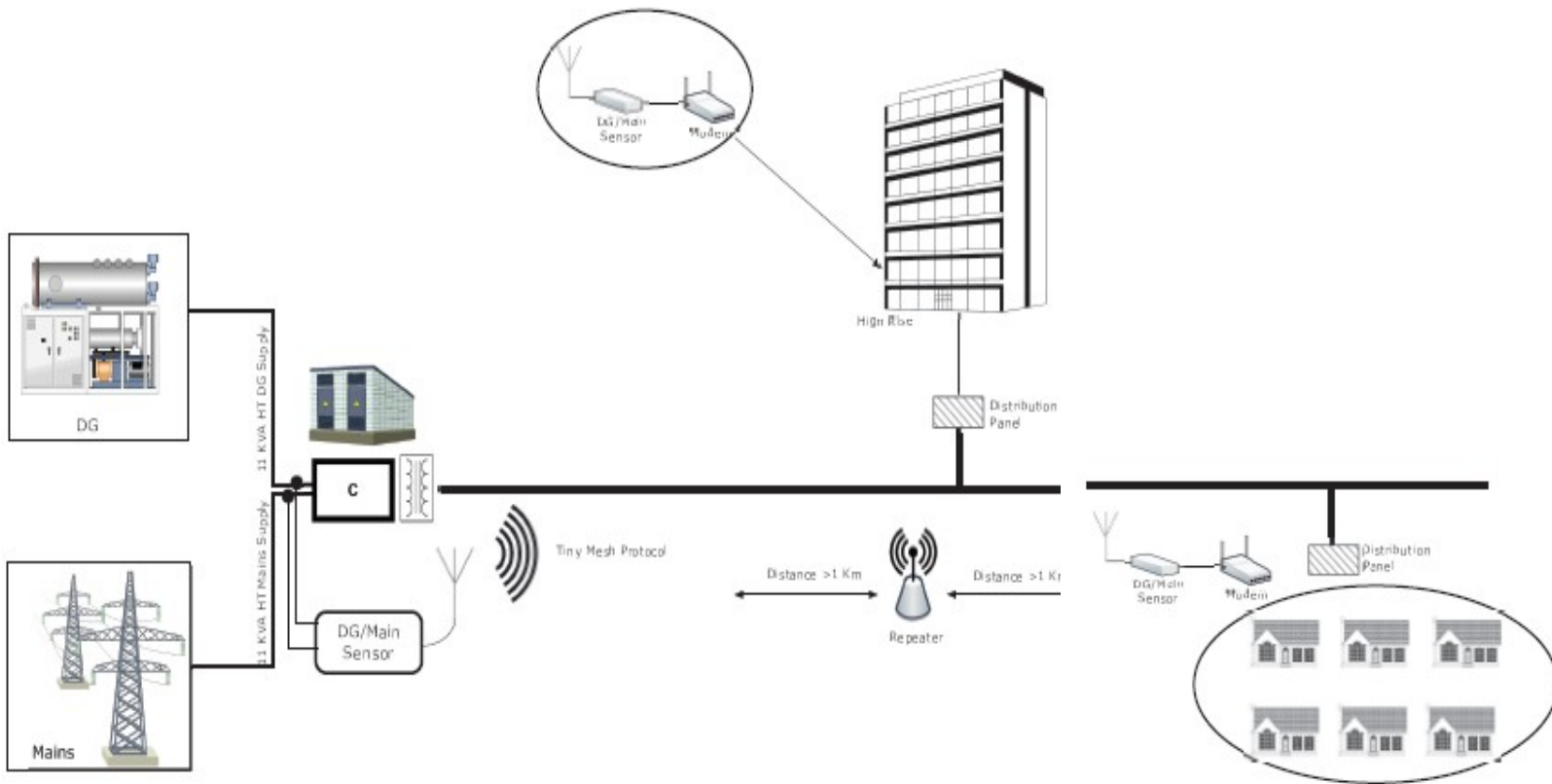
Output Control

Tinymesh

- Eight individually controllable Inputs / Outputs
- Set / Reset individual outputs
- Set and change port configuration with network commands
- Configurable default state (Hi / Lo) for each output
- PWM output for dimming (0-100%)
- Dedicated LED outputs
    - Connection status
    - Signal Strength Indicator

Input Monitoring Tinymesh

- Eight Individually programmable Inputs / Outputs
- Automatically triggered messages
    - Digital level change
    - Analog level change
- Configurable Debounce Timing for Digital Inputs
- Configurable Sampling Intervals for Analog Inputs
- Configurable Trigger Hysteresis for Analog Inputs
- Built-in Temperature- and Voltage level sensors
- Automatic, Time Generated Input Status Reporting
- Polled Status Reporting by command

Serial Data Communication

Tinymesh

- Configurable SW or HW handshake
  - CTS/ RTS
  - Xon/ Xoff
  - ACK / NAK
- Serial Data Streaming support
- Transparent- or Packet mode protocol
- Bit rates to 230 400 bps

Special Features

- RSSI and Connect LEDs for simplified field deployment
- Clustered Node Detection and Network Congestion Avoidance
- RF Tamper Alarm, with Local Alarm and Alarm Messaging
- Time-generated Status Messaging
- Locator Function for Asset Tracking applications
- Network Busy Detection for Gateway
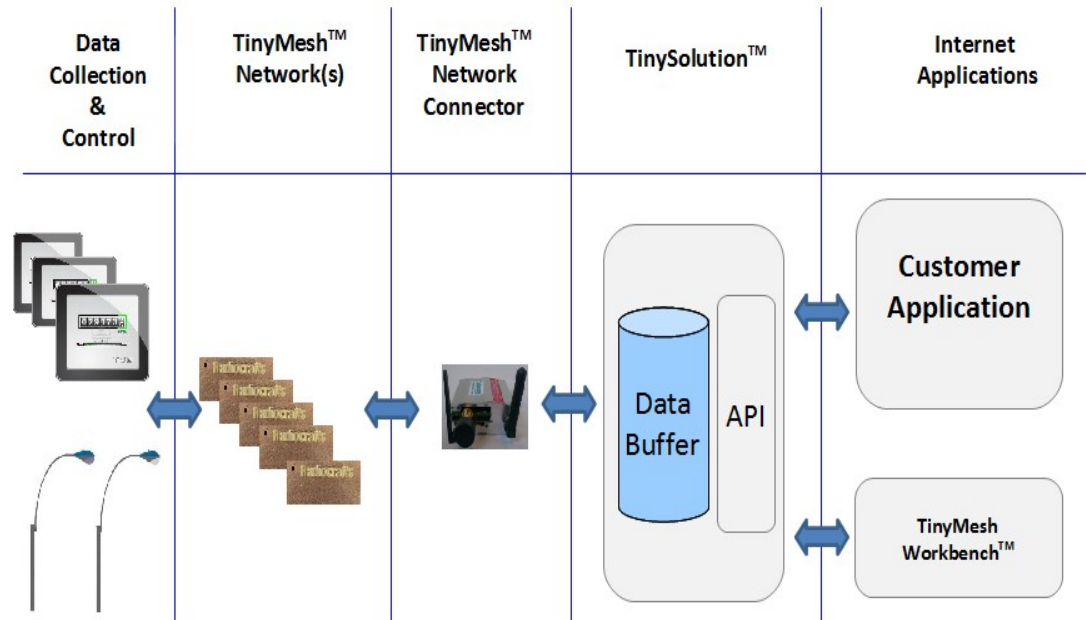- Multiple Gateway support

TinySolution

Tinymesh

Secure data collection and remote configuration over the Internet

Connect TinyMesh networks to the Internet using a computer, or deploy your field devices through a pre-configured GPRS modem
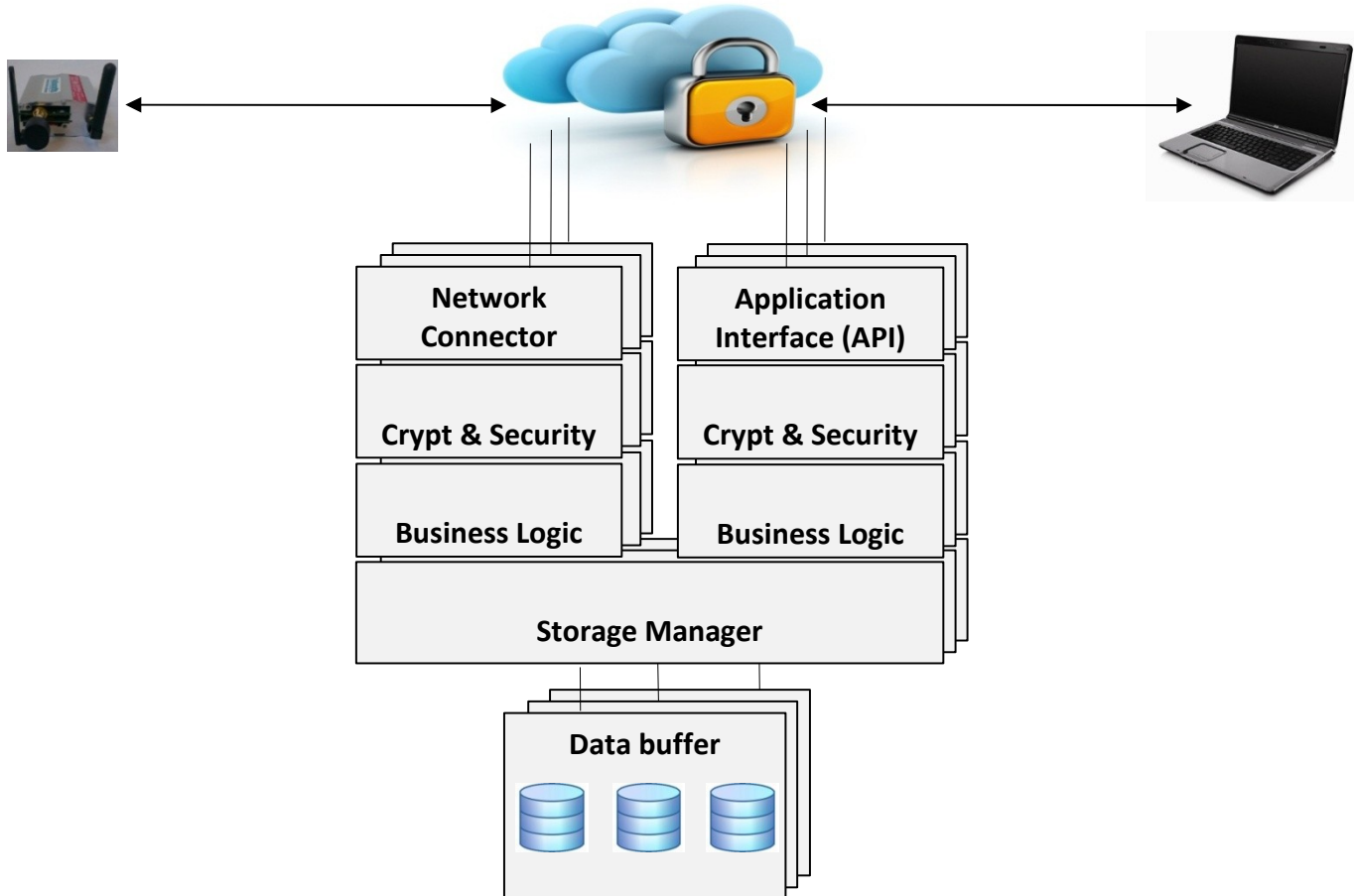
Access TinyMesh data with End to End Encryption through a simple to use TinySolution API.

Use the TinyMesh Workbench for direct Internet control and configuration of any TinyMesh node anywhere.

| Data Collection & Control | TinyMesh™ Network(s) | TinyMesh™ Network Connector | TinySolution™ | Internet Applications |

Data Buffer · API · Customer Application · TinyMesh Workbench™

TinySolution Cloud Architecture

Tinymesh

Network Connector	Application Interface (API)
Crypt & Security	Crypt & Security
Business Logic	Business Logic

Storage Manager

Data buffer

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