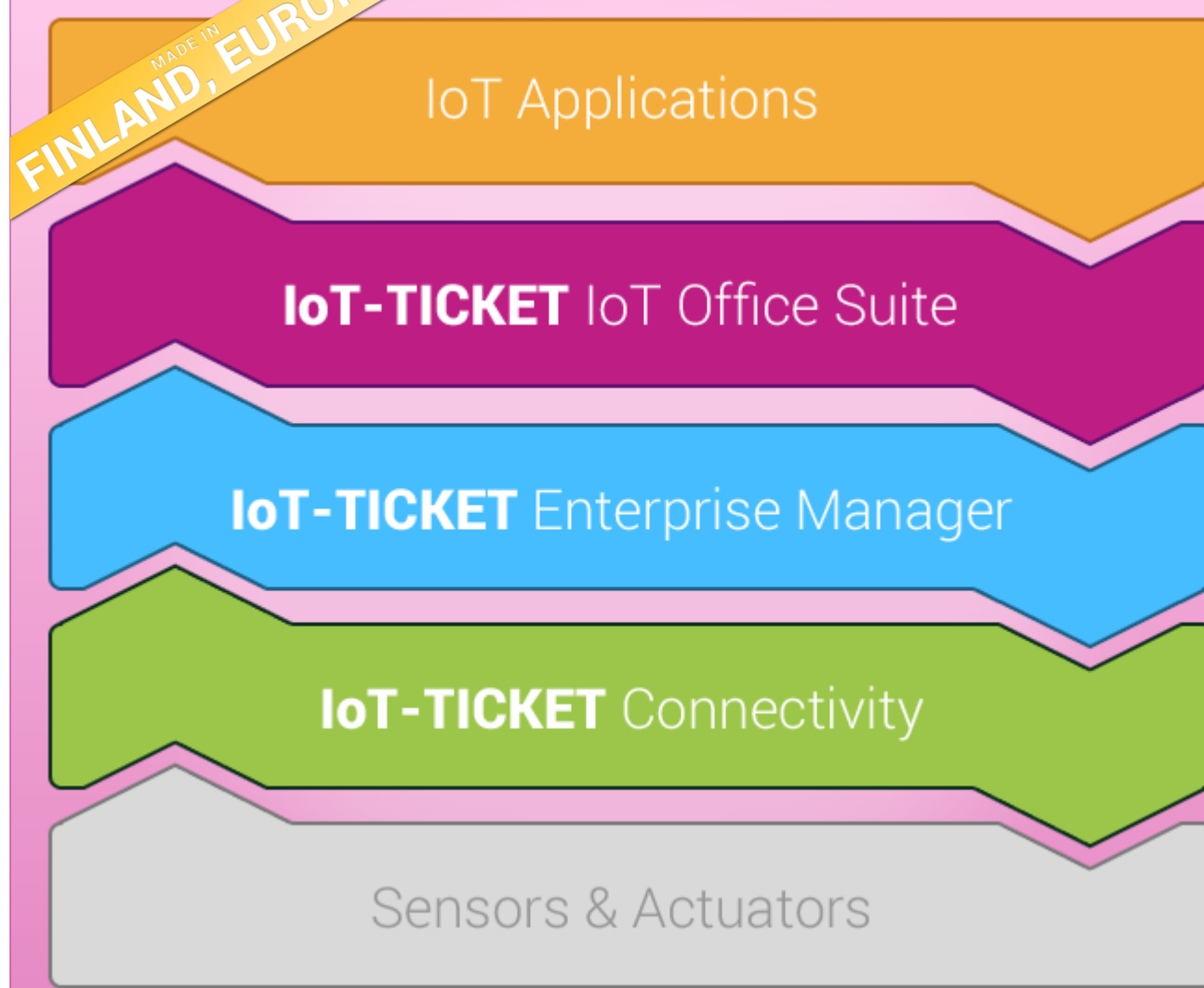




### IoT Applications

- Smart energy
- Smart manufacturing
- Smart cities
- Smart logistics
- Smart environment
- Energy optimization
- Energy trading
- OEE & TEEP monitoring
- Digital twin
- Condition based maintenance
- Performance based services
- Predictive maintenance
- Preventive maintenance
- Digital services
- SCM optimization
- Leakage detection
- Flood monitoring & control
- Smart buildings
- Employee safety
- Security monitoring
- and many more

### IoT-TICKET IoT Office Suite (Application Building Studio)



#### IoT-TICKET Reports

##### Report design

- Web browser based
- Report editor
- Dynamic page content
- Real-time preview
- Cover pages
- Watermark support
- Appendix pages
- Dynamic text variables
- Report parameters
- Snap to grid
- Drag & drop report building

##### Report creation

- Report viewer
- Mobile report viewer
- Component templates
- Multiple pages
- Headers & footers
- Page numbering
- Element guides
- Conditional formatting
- Zoom level
- Inbuilt help
- A4 and Letter Page sizes
- Data-flow logic editor

##### Report creation

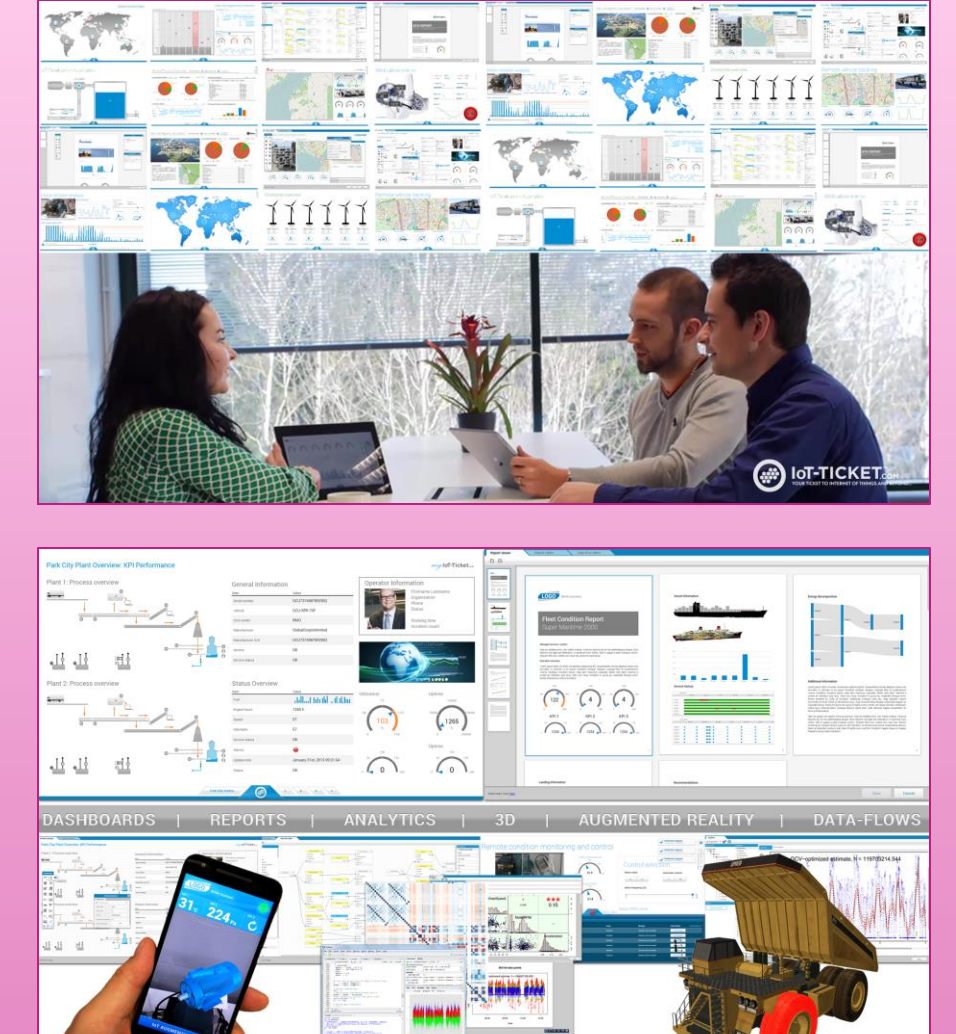
- Manual
- Interval based
- Automatic delivery by mail
- Rule based
- Scheduled
- PDF reports

##### Logic engine

- IoT-TICKET data-flow logic editor
- Big-data enabled
- Analytics enabled

##### Visualization widgets

- Angular gauges
- Camera
- External content
- Image
- Sankey diagram
- Timeline
- Analytic views
- Linear gauges
- Charts
- Map
- Status indicator
- Progress indicator
- 3D objects
- FFT
- Table
- Data table
- Parameter browser
- Label
- State indicator
- Drawing tools
- Line circle square



#### Runs on

- Microsoft Azure
- Amazon web services
- IBM Bluemix
- Google Cloud Platform
- ANYCLOUD
- On premise

Linear scalability  
Deploy anywhere

#### Enabling

- Augmented reality
- Virtual reality
- Mixed reality

#### IoT-TICKET Core

- Web browser based
- Drag & drop UI & UX building
- Enterprise browser
- Alarms
- Events
- Smart Button enabled tray
- Permission based
- Inbuilt help
- Quick access favorites
- Asset information
- Rapid prototyping and deployment
- Smart data aggregation
- Full screen
- Zoom in & out
- Big Data enabled
- Analytics enabled

#### User interface design and layout elements

##### Visualization widgets

- Angular gauges
- Camera
- External content
- Image
- Sankey diagram
- Timeline
- Analytic views
- Linear gauges
- Charts
- Map
- Status indicator
- Progress indicator
- 3D objects
- FFT
- Table
- Data table
- Parameter browser
- Label
- State indicator
- Drawing tools
- Line circle square

##### Interaction widgets

- Dialog
- Accordion view
- Tab view
- Textarea
- Timerange
- Slider
- Button
- Checkbox
- Toggle button
- Datepicker
- Input label
- Combobox
- Data tag selector

#### Apps & Hardware store

- Free data acquisition Apps
- Commercial data acquisition Apps
- Mobile Apps IoTTracker
- IoT-TICKET enabled hardware
- Tutorials
- Developer tools

#### Mobile App Designer

- Design & Deploy Mobile Apps
- WYSIWYG editor
- Preview layout on ~250 devices
- Landscape & portrait mode
- Property editor
- Dashboards for mobile use

#### Data-flow logic editor

##### General

- Web browser based
- Drag & Drop Logic editor
- Data connections
- Interaction design
- Import
- Export
- Properties
- Search filters
- Layout guides
- Zooming
- Keyboard shortcuts

##### Data blocks

- Smart data tags
- Constants
- REST data
- Simulate
- Virtual data tags

##### Calculation blocks

- Absolute value
- Accumulation
- Division
- Logarithm
- Minimum
- Number sequence
- Substraction
- Bit mask
- Average
- Exponentiation
- Mathematical expressions
- Multiply
- Round
- Sum
- Bit shift
- Count
- Filter
- Maximum
- N<sup>th</sup> root
- Square root

##### General blocks

- Analytics
- Navigate
- Notification (Alarms & Events)
- OnLoad trigger
- Scheduler
- Server status
- Time
- Timer
- Timestamp
- Text replace
- Resource info
- Synchronization
- Map pin

##### General blocks

- And
- Bit check
- If-then-else
- Lookup table
- Multiplex
- Nand
- Nor
- Not
- Or
- Ordered execution
- Switch
- Threshold
- Triggered value
- Xor

#### Analytics

##### Forecast

- Fourier arima
- Linear forecast
- Seasonal arima

##### Process control

- Emma chart
- Means & ranges
- Regression

##### Signal processing

- Fourier transform
- Wavelet transform

##### Arithmetic

- Addition
- Division
- Multiplication
- Substraction

##### Plots

- 2D plot
- 3D plot
- Map
- Timeseries plot

##### Distributions

- Cumulative distribution
- Histogram
- Probability density

##### Algebra

- Exponential
- Logarithm
- Power
- Root

##### Calculus

- Derivative
- Integral
- Time derivative
- Time integral

##### Correlation

- Correlation matrix
- Cross-correlation

##### Classification

- K nearest neighbors
- Export to dashboards

#### API

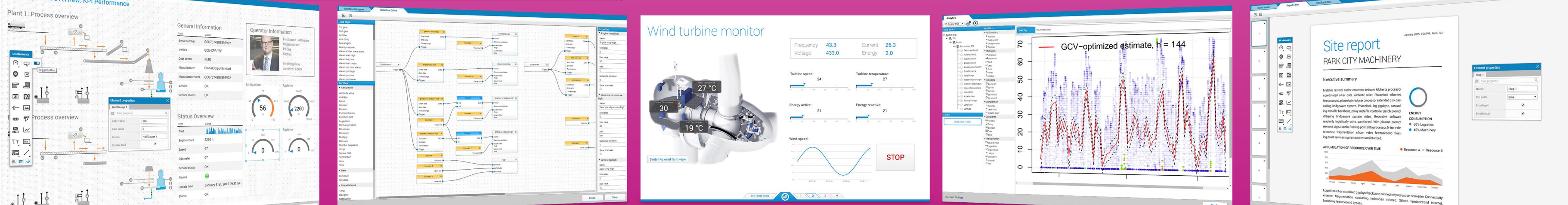
- Public APIs
- WRM API
- IoT REST API
- Simulink interface
- Development kits

#### Partner APIs

- Dashboard REST API
- Storage API
- Analytics API
- Messaging Que
- Event Broker

#### Data interfaces

- MQTT broker
- OPC-UA client
- OPC-UA server



### IoT-TICKET Enterprise Manager

#### Communication

- MQTT
- OPC-UA
- WRM Comm
- REST (JSON + XML)
- Web services
- LoRa

#### General

- Alarms
- Device status
- Online/Offline
- Connection view
- Communication statistics
- Enterprise browser
- Search

#### IoT-TICKET Domain Model

##### Data model

- Measurements
- Statistical data
- Quality
- Analysis
- Files
- Alarms

##### User model

- User
- Profile
- System permissions
- Item & resource permission

##### Asset model

- Enterprises
- Sites
- Assets
- Devices
- Location
- Hierarchies

#### Over the air updates

- Remote configuration
- Firmware updates
- Modular provisioning
- Error detection
- Version history
- Remote rollback
- Security (SSL / SSH)
- Routing
- Application software
- Compression
- Automatic deployment
- Version states
- Deploy custom updates
- Online & Offline updates
- Versioning
- Kernel modules & Device drivers
- Manual deployment
- Logs
- Verified deliveries
- Retries
- Audit trail

#### Identity and Access Management

- Authentication
- OAuth
- Password management
- Password policy
- Profiles
- Delegated Administration
- Customer management
- User privileges
- Asset visibility
- Feature level permissions
- Logging

#### Stream processing cluster

- Yearly statistics
- Data pre-processing
- Weekly statistics
- Hourly statistics
- 3<sup>rd</sup> party microservices
- Minimum
- Count
- Quarterly statistics
- Monthly statistics
- Daily statistics
- Minute statistics
- Average
- Maximum
- Sum

#### Flow computing cluster

- Data-flow logic execution
- Loop detection & prevention
- Resource usage per flow
- Flow validation
- UI state per Dashboard
- Flow cycle transactions

#### Platform infrastructure and operations

##### General features

- Host health monitoring
- Component health
- Centralized logging
- Deployment tools
- Microservice orchestration

##### Security

- Network security
- Vulnerability scanning
- Encryption
- Security process
- Security audits

##### Backup and recovery

- Automated backups
- Configurable backups
- Incremental backups
- Disaster recovery
- Business continuity

#### IoT-Ticket Infrastructure

##### Scalability

- Analytics cluster
- Dashboard cluster
- Communication cluster
- Big Data cluster
- Queueing
- File system cluster (HDFS)
- Cluster Orchestration
- Flow processing cluster
- Reporting cluster
- Stream cluster
- Capacity planning

##### Data storage

- Big-Data
- Hadoop HDFS
- Cassandra
- HBase
- Data storage abstraction layer
- Relational data
- SQL

#### IoT-TICKET co-creation

- IoT-TICKET Training Center
- IDE support
- Scripting
- API
- Developer documentation
- Cluster management
- Version control
- Message queue
- Debugging
- SDK
- Developer samples
- Apps
- Auto deployment environment
- Federations
- Microservice Architecture
- Dashboard REST API
- Configuration server
- Auto test environment
- Centralized logging
- Change management
- Dashboard UI editor
- Data-flow logic editor
- Report editor
- Terminal unit software

#### WRM247+ Terminal Unit App

##### General functions

- Alarms
- Local Scripts
- SMS
- Heartbeat
- Watchdog
- Alarm routing
- Remote system commands
- Web UI Config
- Webserver
- Rule module
- Real-time Linux
- VPN
- Remote tunnel
- Firewall
- Actions
- Triggers
- State monitoring
- Asset registration
- Asset discovery
- Remote access
- Gateway services
- Multi-platform
- Adaptable Firmware
- Module configuration
- Email
- SSH

##### Connection

- Wired
- Wireless
- Router
- Serial
- 3<sup>rd</sup> party
- Full Linux network stack
- Gateway
- Fieldbusses
- 3G / 4G
- IEC 61850
- Firewall & Proxy
- Protocol conversion
- Bluetooth
- 1-wire
- CAN
- Analog / digital IO
- Wirepass
- REST / JSON

##### Rich data types

- Numeric
- String
- FFT spectrum
- Files
- Streams
- Boolean
- JSON
- Binary
- Images
- Date / Time
- Spatial data
- Custom types

##### Data collection

- Data tags
- Sampling rate
- Data scaling
- File watcher
- Data aggregation
- Data buffering
- Log on change
- Polling
- Data normalization
- Send all
- On-demand
- Communication scenarios
- Data normalization
- Scheduling
- Timers
- Data concentration
- Filters
- Monitoring Watchdog

##### Over the air updates

- Remote configuration
- Rollback
- Versioning
- Application software
- Verified deliveries
- Security (SSL / SSH)
- Integrity checks
- Modular provisioning
- 3<sup>rd</sup> party libraries
- Compression
- Firewall
- Firmware updates
- File transfer
- Kernel modules & Device drivers
- Error detection
- Online & Offline updates
- Routing
- Deploy custom updates
- Retries
- Watchdog

##### Logging

- Smart logging
- Structured logs
- Configurable
- On demand retrieval
- On demand retrieval
- Various log levels

##### Device management

- System resources
- Full Linux driver stack
- Event driven drivers
- Optimized real-time drivers
- Custom drivers
- Per device module loading

#### WRM247+ device with integrated sensors

- GPS
- Acceleration
- Temperature
- IP65

#### OPC DA App

- OPC DA server auto-discovery
- Address space browser
- Data tag editor
- CSV export / import
- Data tag management
- OPC read
- OPC write
- Path mapping
- Windows service
- Quick config
- Communication & Quota view
- Application log
- IoT-TICKET device sync

#### OPC UA to DA wrapper / OPC DA to UA

- Conversion
- Address space browsing
- Security
- Legacy system support

#### Industrial automation systems

- PLCs
- Gateways
- Control systems
- SCADA systems
- Automation systems

#### Sensors and Actuators

- Temperature
- Humidity
- Air quality
- Flow
- Pressure
- PIR
- Vibration
- Luminosity
- Location
- Current
- Voltage
- RPM
- Distance
- Fill level
- Position
- Misc. sensors
- Misc. actuators