TRINITY

Maestro E200 Series

TRINITY CLOUD FOR DEVICE MANAGEMENT FEATURES

CONTENTS

TRINITY

DEVICE

Maestro E200 Series

With high-speed cellular (3G and beyond), WAN, LAN and Wi-Fi connectivity, the E200 is a highly versatile, reliable and rugged router designed for mission-critical enterprise applications requiring faultless connectivity.

The E200 comes in two models; the cost-effective HSDPA that ensures always-on connectivity for 2G migration or low-latency sensitive applications such as energy and sales & payment, while the HSPA penta-band is ideal for deployment in vertical markets requiring high-speed or global roaming such as security and transportation.

The E200 can be configured through an easy-to-use web interface; a configuration wizard that will help the user in setting-up the router step-by-step and select primary and redundancy network interfaces; advanced configuration such as VPN, IPsec, OpenVPN and Wi-Fi hotspot settings are also directly available through the web interface. Once configured, a comprehensive set of LED's on the top of the aluminum alloy casing will help the user ensuring the device operate as needed. Remote management is also available through an HTTPS connection to *Trinity Cloud*.

E200 SERIES

E205XT Dual Band HSDPA
E206XT Multimode HSPA+ / EV-DO / CDMA

E205XT Dual Band HSDPA

E206XT Multimode HSPA+ / EV-DO / CDMA

E210 Series Cost-effective, rugged 3G-LTE routers DUAL SIM

E220 Series Highly versatile, reliable and rugged routers

We supply of a wide range of top wireless modems, gateways and devices for every M2M Application. For more information about the *Trinity Device* product range please contact us on +27 11 465 7377 or email hello@trintel.co.za

Trinity Cloud Application Enabling Platform (AEP)

Trinity Cloud is an Application Enabling Platform (AEP) that allows you to connect devices to cloud based services with ease; visualise and interact with your data or integrate with your business systems. To create, monitor, manage and control your machine-to-machine (m2m) or Internet of Things (IoT) environment.

Features
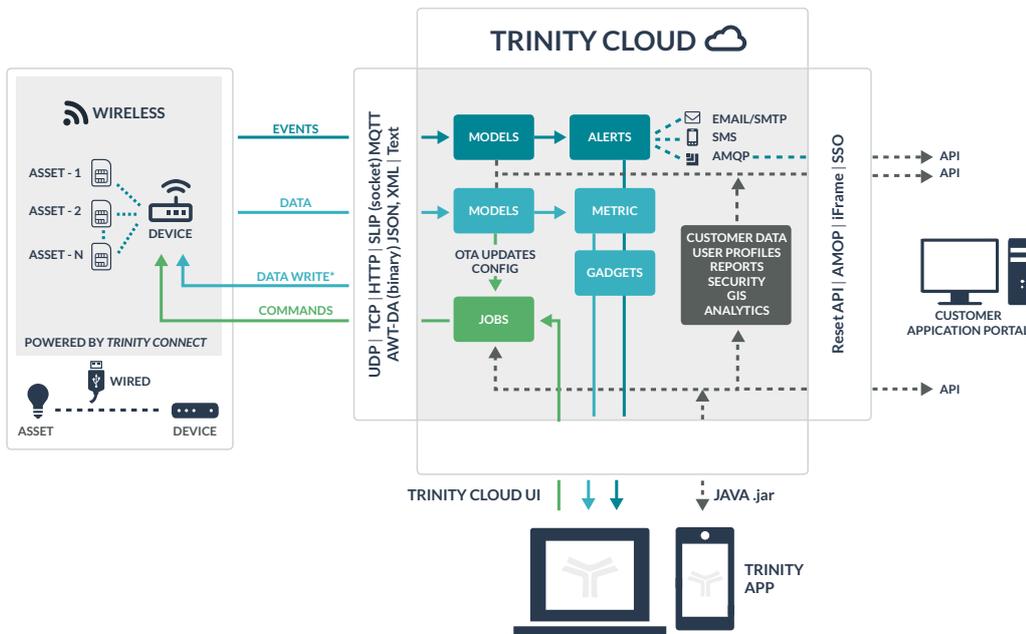
Device Communicators

Trinity provide a number of different Device Communicators working in different programming languages, for different device types, to enable developers to easily and quickly connect to the *Trinity Cloud* platform allowing the core focus to remain with your business application. The Communicator enables three primary message exchange types:

1. **Data messages (RO / RW)**

2. **Event messages (rules triggered)**

3. **Commands (actions from *Trinity Cloud* platform)**

These handle all the mechanisms for devices to connect, authenticate, and exchange these messages using SLIP (socket), MQTT or HTTP protocols. These Communicators are available in C/C++, Android, Java and compiled for Linux, OpenAT, OpenWRT and other frameworks. Built in features for remote OTA updates, configuration mapping, HTTP header proxying, location tracking, device management and automatic network credential updates come standard.

Device Gateway

A configurable Device Gateway opens up the *Trinity Cloud* platform to securely and efficiently connect uniquely developed devices as well as the translation of existing pre-developed m2m / IoT applications.

From traditional OpenAT binary protocols to HTTP standards for JSON, XML or Text, the Device Gateway supports one-to-one or one-to-many communication architectures whether the requirements are better suited to data posts or messaging. *Trinity Cloud* fully supports MQTT and HTTP 1.1 protocols.

Engine

Core to the platform architecture, is the ability to model devices and assets; organise these entities and create users of different profiles to access this information.

Not only the time series information collected by the platform from device / assets, but also the way the entities are organised for inventory purposes, have attached reference data like serial numbers, thing types, lat / long or any number of other application specific references. Geo-locating devices with linkage to the connectivity layer have become key enhancements to the operational tools of managing m2m and IoT systems.

Application Enablement

Without the tools to enable application deployment quickly, the pressure on m2m and IoT business cases often causes projects to fail.

Rapid visualisation of the data through drag & drop dashboard tools helps tremendously to test business case drivers without the need for costly development and long lead times. Platform determined metrics on this data adds in-valuable calculations that can be attached to the visualisation process from raw device / asset data.

API

In a growing community of systems where messages need to be combined with or used in combination with other data sources, accessing the m2m and IoT environment is key.

Our Open API makes it incredibly easy to access device / asset message information, as well as associated other meta data, by the logical and time structured requirements of the application – Trinity API.

General Platform Features

Feature	Description	TS-DM	Roadmap status
Architecture	*Trinity Cloud* is a secure real-time cloud hosted platform accessed through all modern web-browsers (Chrome, Firefox, Safari, Internet Explorer) and auto-formats for Tablets and SmartPhones hosted in South Africa multi-network connected	GA	
Multi-tenant	*Trinity Cloud* supports multi-tenancy across our customers and for customers; allowing for reseller models with parent company management	GA	
Entities	*Trinity Cloud* provides management, monitoring and control over the following entities; mobile APNs, Actility LoRa, SIMs, Devices and Assets ('things') using an array of protocols and mechanisms (UDP, TCP, HTTP(s), SLIP (sockets), MQTT, CoAP, APIs)	GA	
Hierarchy	*Trinity Cloud* provides users with both a Company, sub-Company and Folder (grouping) functions to organise and arrange entities for their estate	GA	
Customisations	*Trinity Cloud* can be customised on request for the following; unique URL, logo, platform colour skin, landing pages and style	GA	
Attachments	A platform storage service available at a Company level or Entity level for attaching relevant information (policies, photos etc.)	GA	
User management	The platform provides a multi-dimentional user setup where Users are uniquely identified via a Username, pasword rules can be set, meta-data attached and associated to Entities, Folders and Profiles	GA	
User profiles	Each Entity has full CRUD functionality (create/admin, read/view, update/edit, delete, control) over various functional aspects per Entity	GA	
User auditability	Every User actions on the platform are logged with detailed change history	GA	
User notifications	Notifications are associated to Users for all Entity types on different platform actions or mappings from Entities. Multiple end-point options are available or can be configured	GA	
Unit user (single / folder level)	These are special users created with very limited views and rights to access either a single Entity or Folder of Entities (typically for end customer web-application engagement)	GA	
Notifications (pipelines)	Notifications are generated from different sources across the platform and Entities. Default routing to Email and SMS (limits may apply); or other optional/ configured end-point (Telegram, Stride, Slack, G-suite, etc.) or other Entities (devices, apps, API's, etc.)	GA	
Campaigns	The platform is able to support the launch of any Command defined in a Device model via a Campaign. Campaigns are designed to assist with the operation task of deploying new Firmware or updating Settings on multiple Device (no limit). The Campaign manager gives an administrator the tools to define, schedule, manage and monitor the execution of these actions	GA	
Batch	Batch services to Create, Delete, Move or Edit are available for Entities where mass changes are required	GA	
Models	The system uses Models to describe normalised data across the platform. These Models are created and deployed by Trinity working with customer firmware developers	GA	
Reports	The system provides an arrary of Reports to extract management data and raw data from the platform	GA	
Billing	The system can adjust device bills according device state, volume of data stored and/or number of notification messages sent individually or aggregated per Entity or Folder group (depends on commercial agreement)	GA	

GA: Generally Available now   **I:** Integration update required   **D:** New development required

Maestro E-series Device Agent

Feature	Description	TS-DM	Roadmap status
Architecture	The Maestro agent runs an MQTT Trinity client connected to the TrinitySMART platform broker running no service blocking or interupting processes on the router. It occupies user space within the OpenWRT framework, auto-starts on bootup and always maintains a MQTT session with the server	GA	
Security	SSL encryption is enabled on the device communications by default, but can be disabled remotely if required	GA	
Provisioning / Activation / Registration	Self provisioning of the device is done via SSH (factory or individual) or via the Maestro web-interface by enabling the device management and adding the necessary credentials	GA	
Keep alive	Embedded in the client is a keep-alive ping to the broker. This ping period is configurable via the platform and also triggers a platform event when not received. It is an immediate trigger on the first ping not received	GA	
Periodic reporting	The agent sends the following key wireless/device data to the platform on a settable period for periodic health and monitoring. The platform watchdog (comms state) is linked to this health check frequency	GA	
Publish full data key attributes	This is a platform initiated request to the agent to publish all data attributes as soon as the command is received. This is for immediate diagnose	GA	
Publish specific UCI attribute(s)	From the platform it is possible to query "any UCI value" as a one-time request, on the Command action. This command evokes the agent to 'Publish the UCI setting' with a UCI Key string e.g. 'network.loopbacks' and the value will be captured to the platform	GA	
Remote reboot	On a Command from the platform, if the router is online, the agent will execute a device reboot	GA	
Remote agent app restart	On a Command from the platform, if the router is online, the agent will execute a agent restart	GA	
Write speciifc UCI attribute setting(s)	From the platform it is possible to set "any UCI value" as a one-time command. This command instructs the agent to 'Set a UCI attribute' with a UCI Key string e.g. 'network.wireless.wifi.passord/ch@ng3' to make remote UCI changes	D	Committed: August'18
Device 'sys log' viewer in platform (Spyglass)	From the platform it is possible to set the device to report the 'sys log' outputs to the platform user interface for analysis. This is a direct stream of the log file to the platform	D	Committed: August'18

GA: Generally Available now   I: Integration update required   D: New development required

Device Management Features

Feature	Description	TS-DM	Roadmap status
TrinitySMART Maestro E-series support	Full integration of the Maestro E-series routers (E205, E206, E21x, E22x)	GA	
Manage device meta-data	For each device an essential set of information related to that device, system wide and user, is captured or populated. These values are searchable, all indexed back to the UniqueID (IMEI)	GA	
Manage device custom meta-data	For each modelled device it is possible to setup any number of customised data fields as either; lists, strings, dates or values. These fields can be set as 'manditory' or not, and/or searchable	GA	
Device life-cycle	The platform defines four life-cycles for a device: 1. Registered 2. Activated 3. Deactivated 4. Reactivated, all with timestamp of the latest state	GA	
Automatically associate with a SIM	The platform will automatically link to a SIM via the IMSI if also managed as an Entity by the platform	GA	
Automatically associate location	The platform will automatically link the device location to the latest reported in GPS data parameters.	GA	
Send Files	Optional: the user can send a file to the device	GA	
View raw data content	The user can view the content of the raw data reported by the device.	GA	
View raw data history	The user can view the history values of any particular data node.	GA	
View event history	The user can view the history of all the events generated by the device.	GA	
View custom dashboards	The user can see and interact with custom dashboards created for the device's metric model.	GA	
View metric data content	The user can view the latest computed data values for a device.	GA	
View metric data history	The user can view the history values of any computed metric. The user can select to re-compute the metric values for a device – as far back as a month.	GA	
View device job history	The user can see the history and status of all jobs sent to the device.	GA	
View firmware job history	The user can see the history and status of all firmware jobs sent to the device.	GA	
Attach Documentation	The user can upload and store documentation or other files associated with this device. This can be firmware files, images or any electronic documents	GA	
Real time communication packet inspection (Spyglass)	The user can select to subscribe to a live data feed of the 'sys log' file streamed from the device	I	Committed: August'18
Unit User Access	The user can create unit-users that can view the dashboards created for the device	GA	
Change History	Every change associated with a device, performed by a user is logged for auditing	GA	

GA: Generally Available now   **I:** Integration update required   **D:** New development required

Device Data Life-Cycle Management

Feature	Description	TS-DM	Roadmap status
Order devices online	Devices are grouped into folders with sub-folders	GA	
Add device to platform	Users can add devices to the system manually. This can be don individually or in bulk.	GA	
Device Birth Certificate	A device birth certificate signals activation and billing for that device. By default all devices added to the system will be added in the state 'Stock' / 'Registered'	GA	
Data State – Registered	Devices built to stock, those with a birth certificate are defaulted to this state, and no data will be saved for devices in this state. Functionally these devices will not be allowed access to the platform if they attempt to connect, and the platform will not allow interaction with them, this includes sending files, wake-up signals, or commands and data write attempts. Devices can only be moved into and out off the Registered state once.	GA	
Data State – Active	Devices in the active state have their data saved, archived and accessible to the platform and its APIs. All the usual interaction will be allowed for these devices. Failure to report in will trigger a system work flow. Devices may be moved between 'Active', 'Deactivated' and Reactivated' states at will.	GA	
Data State – Deactivated	Deactivated devices are devices that have been active, but are dormant for the moment. No data will be saved for dormant devices, but their history data will be preserved. The will appear dormant on the system, and the platform will not be able to interact with them in any way. This includes sending files, commands or wake-up signals. Dormant devices may be refused access to the system if they try to connect. Failure to report in will not trigger a platform work flow. Devices can be moved into and out of the deactivated state from either the 'Active' state or the 'Reactivated' state.	GA	
Data State – Reactivated	These devices will return the the 'Active' status on the platform as above	GA	
Delete/Purge device	Devices can be removed from the platform altogether. Removing a device from the platform removes all its associated data. This step is irreversible.	GA	

GA: Generally Available now   **I:** Integration update required   **D:** New development required

Device Group Management

Feature	Description	TS-DM	Roadmap status
Devices grouped by Folder	Devices are grouped into folders with sub-folders	GA	
View pre-defined group-level dashboards	Device management provides some pre-defined high level overview of the device groups. This includes aggregated communication states, etc.	GA	
View group members	User can view a list of all the members of a folder / group	GA	
Group Manager functionality	User can set up a group manager to receive notifications about the devices in a particular group.	GA	
Event subscription	Devices may report any number of events. Users can select to subscribe to these events and receive notifications when they occur – with custom detail about the event.	GA	
Customise folder structure	Uses can create, edit and delete folders ad hoc.	GA	
Move devices between folders	Uses can move devices between folders directly from the System. Either in bulk, or individually	GA	
Custom group level dashboards	Users can create custom dashboard to monitor group device activity.	GA	

GA: Generally Available now   I: Integration update required   D: New development required

Device Metrics, Dashboards & Lists

Feature	Description	TS-DM	Roadmap status
Customised metric calculations	Via the metric engine, it is possible to create an metric outcome from the device data inputs	GA	
Metrics for Dashboards	Once a set of metrics has been created, it is possible to associate these with gadets and build dashboards for visual the device data	GA	
Metrics in Device Lists	Once a set of metrics has been created, it is possible to associate these with columns in the device lists	GA	

GA: Generally Available now   I: Integration update required   D: New development required

⅄ TRINITY

CAPE TOWN

T +27 21 914 6252
F +27 21 914 6251
hello@trintel.co.za

1st Floor
Old Warehouse Building
Black River Park South
Observatory

JOHANNESBURG

T +27 11 456 7377
F +27 862 241 644
hello@trintel.co.za

IUM Building
17 Bradford Road
Bedfordview
2008

www.trintel.co.za

maestro
empowering wireless

MAESTRO-WIRELESS HEAD QUARTERS

9th Floor, Wing Cheong Factory Building
121 King Lam Street, Cheung Sha Wan
Kowloon, Hong Kong

T +852 3955 0222
F +852 3568 4833
sunny.mok@maestro-wireless.com