



Repeatit – Portfolio Overview

Frank Pauer
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Repeatit Company Profile



Swedish Company based in Stockholm

Been in the market successfully since 2001

Present in more than 50 countries around the globe

Focus on PTP & PTMP Carrier Grade Wireless Systems



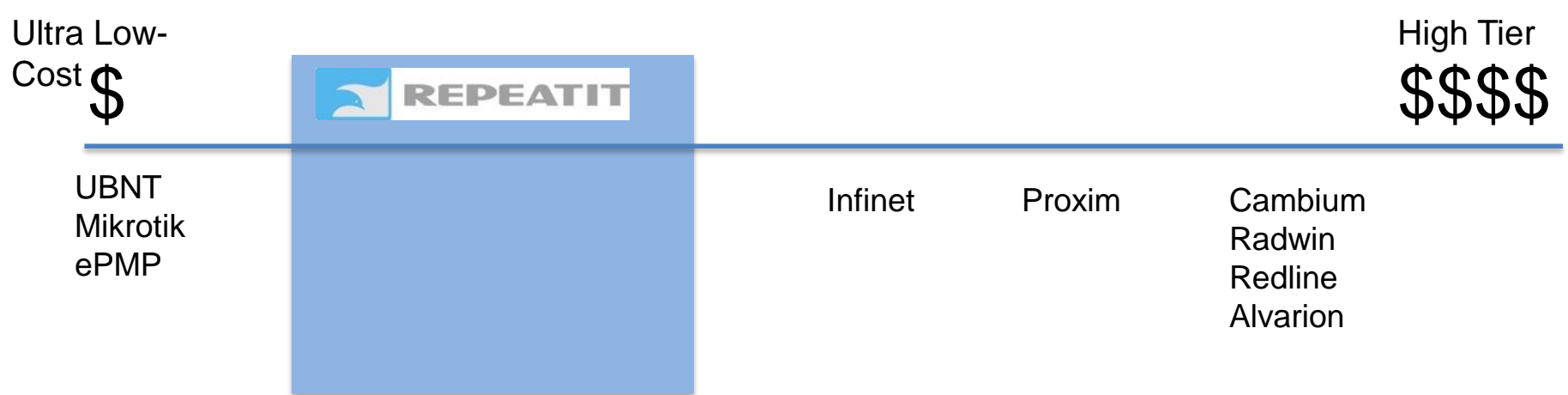
REPEATIT

Quality – Made in Sweden



Engineering, Manufacturing & Supply Chain are based in Sweden
Highest Level of Quality Controls & Checkpoints through the whole process
24 month standard warranty on all products & MTBF of more than 60 years
IP67 & optional IP68 rating for all products

Best Price-Performance-Ratio in the market



Many customers are not willing anymore to pay thousands of dollar for a 3 or 5 GHz link
Ultra Low-Cost is in many cases not meeting the quality & feature requirements
Repeatit is using the same or similar components like other High Tier vendors
Very competitive pricing due to Repeatit's lean company structure & 100% channel focus

Trinity TDD Point-to-Point Portfolio



T316



T318



T323

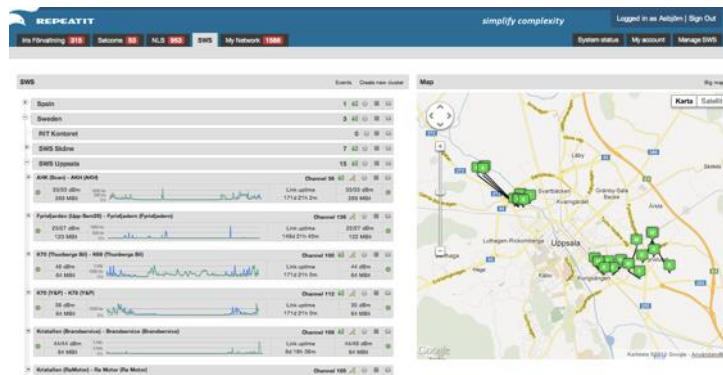


T300

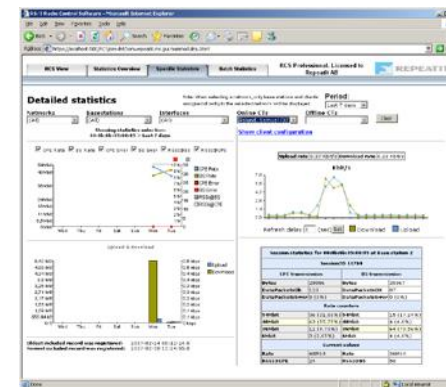


SyncMaster

Identical Software in all products
Future Proof Free Software upgrades
24 month standard warranty



Free Cloud based Management System



Free Local Management System

Point-to-Point Trinity Feature Highlights



Available in 3.35-3.75, 4.9 & 5.1-5.9 GHz

245 Mbps Net Throughput & Gigabit Ethernet Interface

Advanced **GPS Link Synchronization** for dense networks

MIMO Technology in all products

Data Latency **< 2ms**

Less than **6 Watt** Power Consumption

128 bit AES Encryption

QoS: Four traffic classes prioritise traffic

Native **VLAN** support

Configurable in 5/10/20/40 MHz Steps

Simple Antenna alignment with **LED & Alignment Sound**

Build in RF ESD/**Surge protection** up to 15 kv

In-build Speed Test & Spectrum Analyser

Timeslot **Multipoint** Release for all PTP in Jan 2015

Point-to-Point goes Multipoint



Features

Free-of-charge Software Upgrade will enable all TDD Point-to-Point to become Multipoint

Flexible configurable hardware (customer decides if link will be a Base Station, PTP or Subscriber)

Main advantage: Guaranteed traffic per Subscriber - Each Subscriber can be assigned 1-8 timeslots

Up to 16 Subscribers per Base Station in the first step – 32 planned for the second step

Applications

Multipoint Backhaul for Last-Mile Base Stations

Last Mile Access for Critical Business Customers who require minimum guaranteed bandwidth

Increase of ISP revenue by allowing higher Tier Services also to Private Households

TDD & GPS Synchronization for Dense Networks



Trinity SyncMaster



Trinity SyncMaster

Synchronization unit for Trinity Series

Product Highlights

- GPS Synchronization unit
- Synchronize all units in one site
- Provides GPS localization
- IP67 outdoor unit
- Heavy duty enclosure
- One N-male GPS antenna included

Can sync up to 12 Links per Sync Master

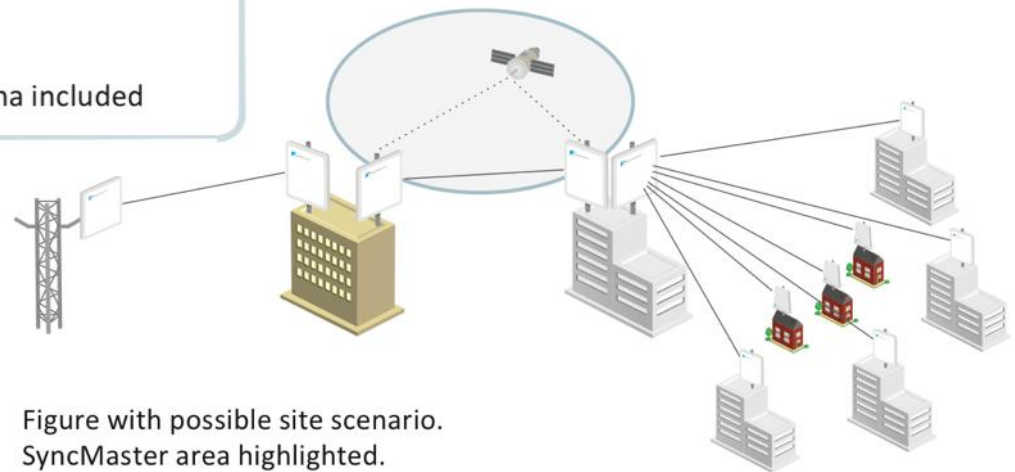
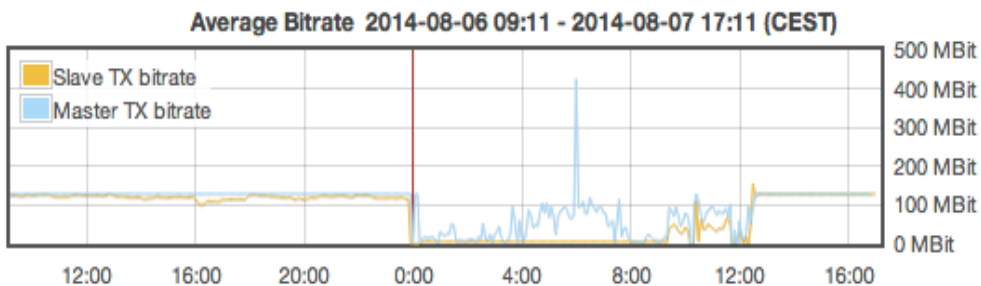
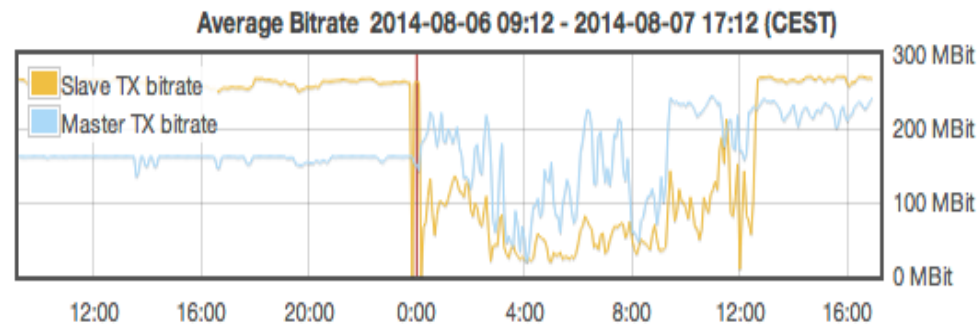


Figure with possible site scenario.
SyncMaster area highlighted.

Best Practice Synchronization Example

Synchronization is essential in dense networks when links are running on the same channel
But even if they are on different channels, synchronization is stabilizing a network
Below is an example of two links installed very close to each other due to limited mast space
Both links use different channels but are pointing in the same direction
Between 0:00 and 12:00 the Synchronization was turned off:



240 Mbps PTP with advanced features



Trinity-323TDD & TDD Plus



Distance	Trinity-323TDD	Trinity-323TDD Plus
< 1 km	105 Mbit	245 Mbit
2 km	103 Mbit	243 Mbit
3 km	102 Mbit	242 Mbit
4 km	101 Mbit	240 Mbit
5 km	93 Mbit	193 Mbit
6 km	93 Mbit	192 Mbit
7 km	62 Mbit	128 Mbit
8 km	61 Mbit	128 Mbit
9 km	60 Mbit	127 Mbit
10 km	60 Mbit	127 Mbit
15 km	40 Mbit	83 Mbit

Throughput UDP, 30dB max ETSI EIRP, 6dB margin

Flexible configurable Frequency Range:

5.150 - 5.845 GHz

23 dBi Integrated Dual Polarized MIMO Antenna

Distance: **Up to 15 Km** in ETSI – **Longer Distances** for Non-ETSI

3 GHz for Long Distance and Non-Line-of-Sight



Trinity-323TDD-N36 Plus



Distance	Trinity-323TDD-N36
< 1 km	245 Mbit
2 km	242 Mbit
3 km	241 Mbit
4 km	240 Mbit
5 km	240 Mbit
6 km	239 Mbit
7 km	238 Mbit
8 km	237 Mbit
9 km	236 Mbit
10 km	236 Mbit
15 km	231 Mbit
20 km	227 Mbit
25 km	223 Mbit

Throughput UDP, 25dB max txPower, 6dB margin

Flexible configurable Frequency Range:

3.35 - 3.75 GHz

23 dBi Integrated Dual Polarized MIMO Antenna

Distance: **Up to 25 km**

External Antennas for even longer Distances



Trinity-300TDD & Trinity-300TDD-N36



Flexible configurable Frequency Range:

Trinity-300TDD: 5.150-5.845 GHz

Trinity-300TDD: 3.35-3.75 GHz

2 x N-female Connectors

245 Mbit/s (Range depending on external Antennas)

Small Form Factor for low profile installations



Trinity-318TDD & TDD



Distance	Trinity-318TDD	Trinity-318TDD Plus
< 1 km	105 Mbit	245 Mbit
2 km	105 Mbit	242 Mbit
3 km	93 Mbit	194 Mbit
4 km	62 Mbit	130 Mbit
5 km	62 Mbit	129 Mbit
6 km	62 Mbit	129 Mbit
7 km	41 Mbit	85 Mbit
8 km	41 Mbit	85 Mbit
9 km	31 Mbit	64 Mbit
10 km	30 Mbit	63 Mbit

Throughput UDP, 30dB max ETSI EIRP, 6dB margin

Flexible configurable Frequency Range:

5.150 - 5.845 GHz

18 dBi Integrated Dual Polarized MIMO Antenna

Distance: **Up to 10 km** in ETSI – **Longer Distances** for Non-ETSI

Unique & Reliable Microwave Redundancy



Trinity-318TDD Redundancy & Trinity-323TDD Redundancy



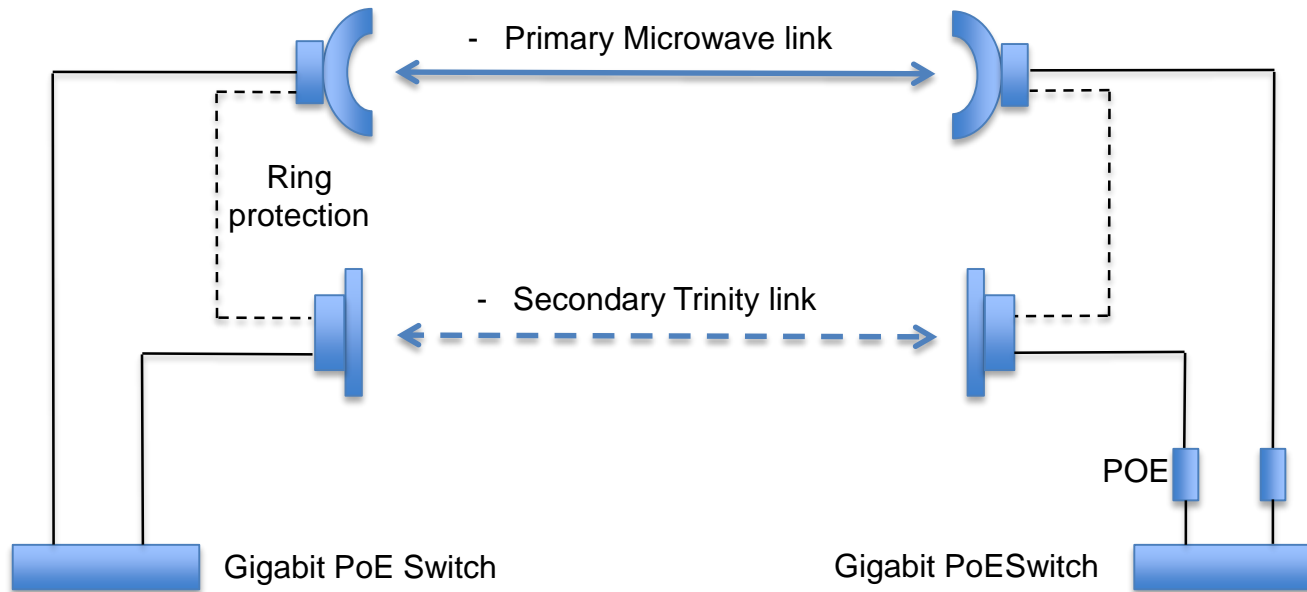
Easiest & fastest Microwave Redundancy Set-Up available in the market

Same as 323TDD Plus & 318 TDD Plus but with 2 GigE Ports & Unique Redundancy Software

Microwave Redundancy with up to 245 Mbps for up to 15 km

Available in 5.150-5.850 GHz

Hotstand-By, Power & Hardware Redundancy



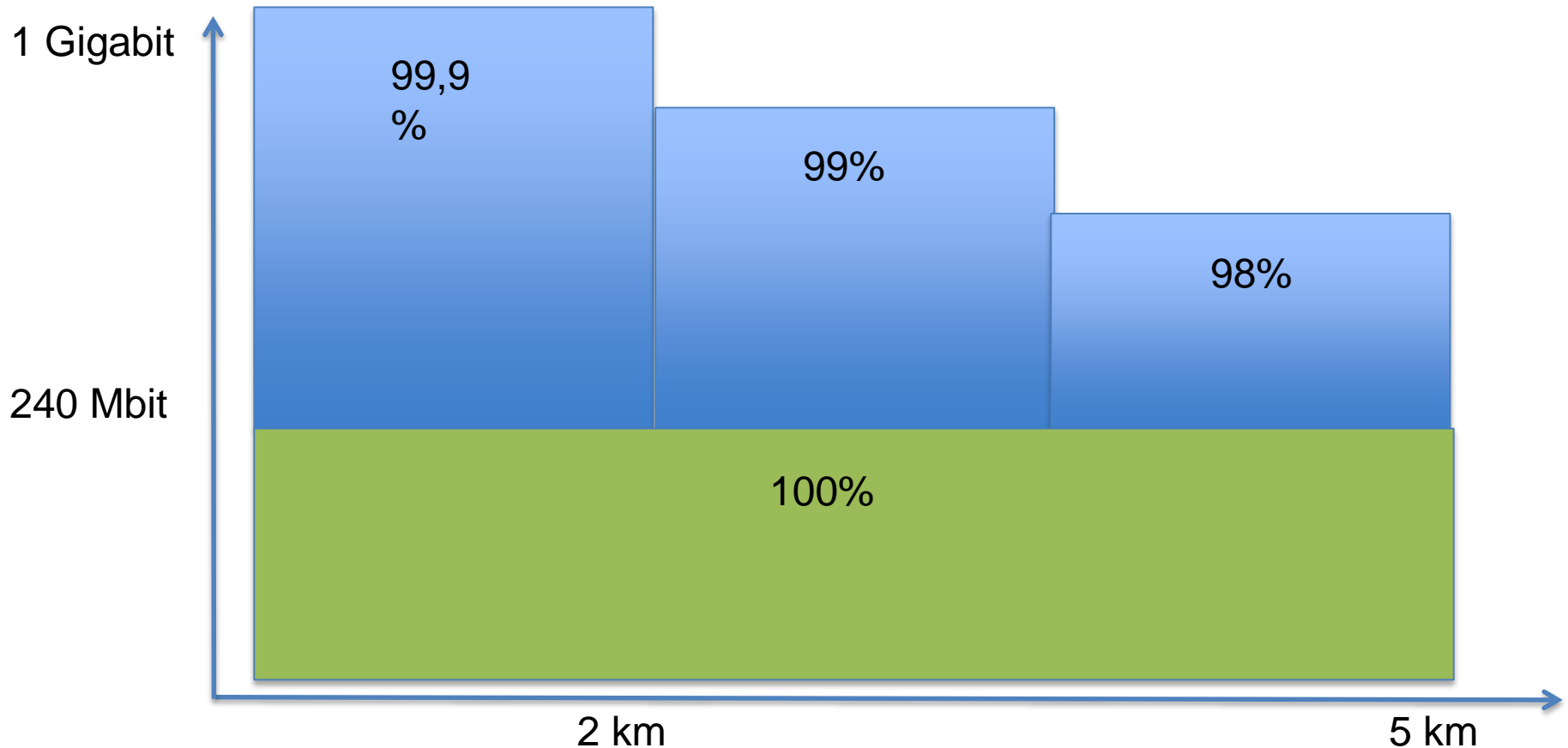
First GigE Port acts as Management Port and PoE Power Redundancy

Second GigE Port connects directly to the Microwave

Through Ring-Protection the Trinity takes over traffic when Microwaves goes below configured threshold

Repeatit Anti-Loop guarantees complete Hardware Redundancy without danger of a Loop creation

Example for a 5 km Redundancy with a 80 GHz Link



Trinity Redundancy enables installers to stretch microwave to the distance limits

It allows to use smaller Microwave antennas as the transmission will never completely fail

Only around 20% of all microwaves sold today have a redundancy – A big market to be addressed

Professional PTP for shorter distances



Trinity-316s



Distance	Trinity-316S
< 1 km	245 Mbit
2 km	243 Mbit
3 km	170 Mbit
4 km	130 Mbit
5 km	85 Mbit
6 km	84 Mbit
7 km	64 Mbit
8 km	64 Mbit

Throughput UDP, 30dB max ETSI EIRP, 6dB margin

Flexible configurable Frequency Range:

5.150 - 5.845 GHz

16 dBi Integrated Dual Polarized MIMO Antenna

Distance: **Up to 8 km** in ETSI – **Longer Distances** for Non-ETSI

PTP for smaller budgets

Trinity-116M Plus



Distance	Trinity-116M Plus
< 2 km	100 Mbit
3 km	75 Mbit
4 km	55 Mbit
5 km	35 Mbit
6 km	34 Mbit
7 km	24 Mbit
8 km	23 Mbit

Flexible configurable Frequency Range:

5.150 - 5.845 GHz

16 dBi Integrated Dual Polarized MIMO Antenna

Distance: **Up to 8 km** in ETSI – **Longer Distances** for Non-ETSI

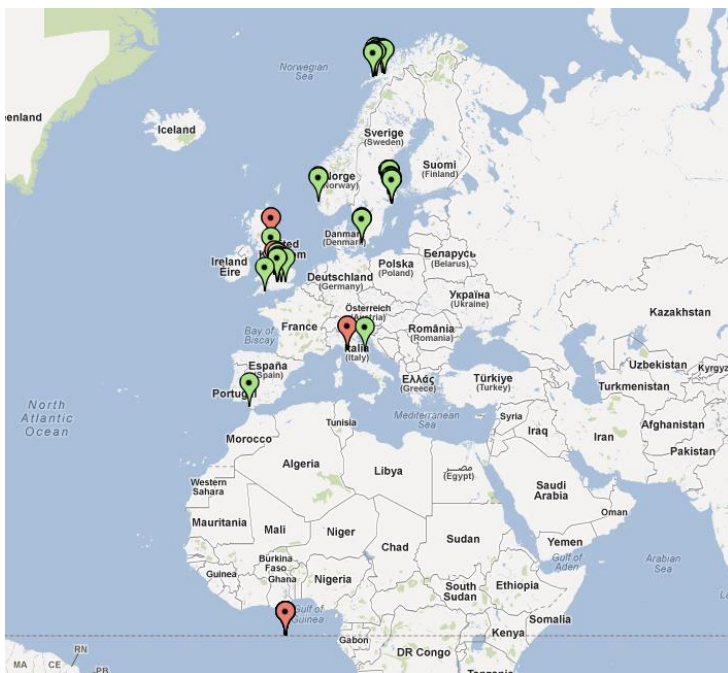
No GPS Synchronization

No Multipoint Support

Free-of-Charge Cloud Management for PTP



Repeatit "The Cloud"



Cloud based on Repeatit Server

Monitor & Configure Trinity Links

Database storage of traffic and radio statistics

Advanced Alarm service

Google Maps location of units

Firmware Upgrade

Secure communication using SSL

Trinity units work alone if server is lost.

Register your Cloud Account at www.repeatit.se & create your own Repeatit Cloud today!

Free-of-Charge Server Based Management



Repeatit "RCS"

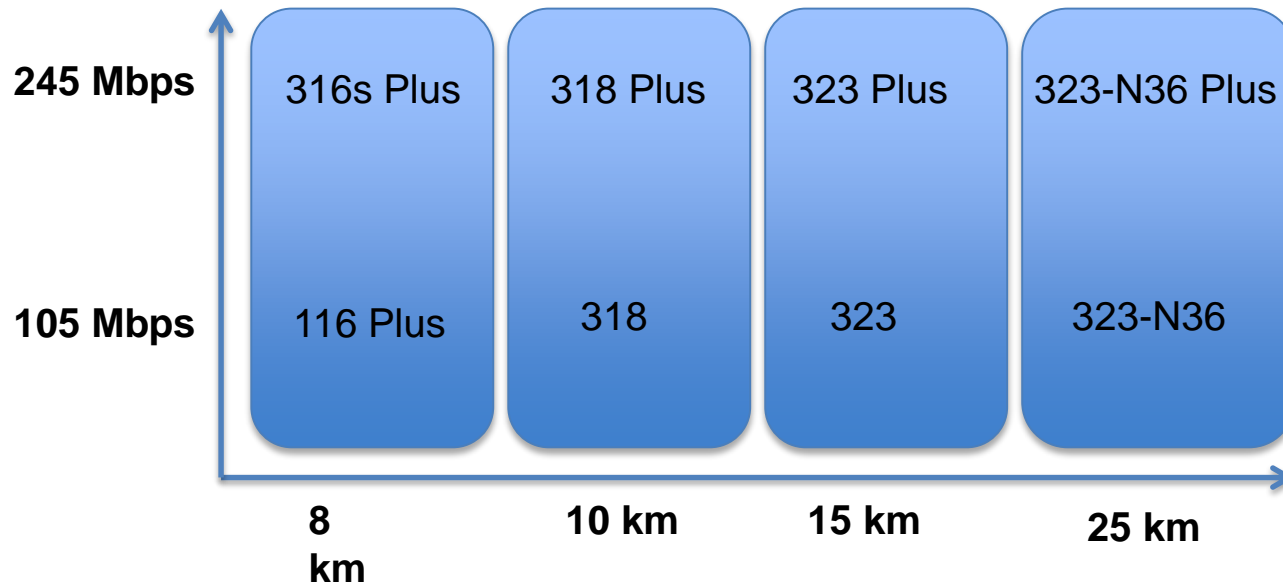
The screenshot displays the Repeatit RCS Professional web interface. At the top, there are navigation tabs: 'RCS View', 'Statistics Overview', 'Specific Statistics', and 'Batch Statistics'. The main header area includes the text 'RCS Professional. Licensed to Skandinaviska Wlanspecialisten' and the Repeatit logo. The interface is divided into three main sections. The left sidebar contains a 'System menu' with links to System, Networks, Rulesets, Base stations, Client Terminal Users, Client Terminals, and About. Below this is a 'Log off' link and a 'Quick search' section with a search bar and checkboxes for Base stations, Users, Clients, Rejected clients, and Events & notes. The central panel shows a 'Refresh-on-click' button and a status message: 'Pago (FlorentinaE) has been changed locally RCS settings differs from settings reported at last connect.' Below this is a list of networks and base stations, including Alnet-Florin (5), Alnet-Links (11), Alnet-Marquesado (4), Alnet-Pago (6), Alnet-Rana Verde (3), AlnetWiRed (6), Bahnhof-Malmö (3), Bahnhof-Uppsala (5), ComPartner Myklebostad (2), Iris-Almåså (11), SWS-Hököpinge (4), SWS-Kulladäl (3), and SWS-Tumba (5). The right panel features a 'Repeatit Infoline' section with an announcement about an upcoming software release in the second week of April, followed by a 'Latest softwares' section. At the bottom of the right panel, there are two screenshots of the software's data visualization capabilities, showing a 'Detailed statistics' window with a bar chart and a 'Batch statistics' window with a color-coded table.

Repeatit RCS – For all customers who don't want to use their own Server

Same features as The Cloud but also supports 3rd party equipment

Summary of Point-to-Point

Point-to-Point Overview



GPS Synch is available to increase density and minimize self-created interferences

Every TDD Point-to-Point except 116M Plus is already Point-to-Multipoint ready

Software to enable Multipoint for up to 16 Subscribers will be launched in Jan 2015

Free-of-Charge Cloud & Server-based Management System

Point-to-Multipoint Highlights



- Support IEEE 802.11n with 2x2 MIMO (backward compatibility to 802.11a/b/g)
- Full range 3.35-3.75 & 5.150 – 5.845 GHz via the same hardware unit
- 180 Mbps data throughput per radio
- Total of **360 Mbps** per Base Station
- Multiple **SSID** support
- Unique 802.1q (**VLAN**) per SSID
- Radio access bandwidth control
- Firewall** and collection of traffic statistics
- Security – Encryption 64 /**128 bit** WEP, WPA , WPA2 with TKIP or CCMP/AES
- RCS and/or MAC level Authentication
- Power over Ethernet; Build-in RF ESD/**Surge protection** up to 15 kV

360 Mbps Capacity in one Base Station



BS342 MIMO

2 x 2 MIMO Dual Polarization

Total throughput: 360 Mbps for up to 200 Clients

Two Base Stations in one housing:

1. Inbuilt antenna radio 802.11AN with 90 degree antenna
 - 180 Mbps Net Throughput
 - 23dBm radio transmit power
 - Up to 100 Subscribers
2. Second 180 Mbps radio 802.11AN for external MIMO antenna



Second radio

Also Available with:

4 x N-Connectors - BS322

1 x Radio - BS340

1 x Radio & 3 GHz – BS320-N36

Two Radios in One Base Station



External 90 degree Antenna
connected to BS342

Base Station BS342 with
integrated 90 degree antenna

Up to 100 Mbps per User



Up to 8 km distance and 100 Mbps Net Throughput

SU116 MIMO - including mast brackets & PoE

16 dBi Dual Poll Antenna

100 Mbit/s

5/10/20/40 MHz channel widths



Up to 15 km distance and 100 Mbps Net Throughput

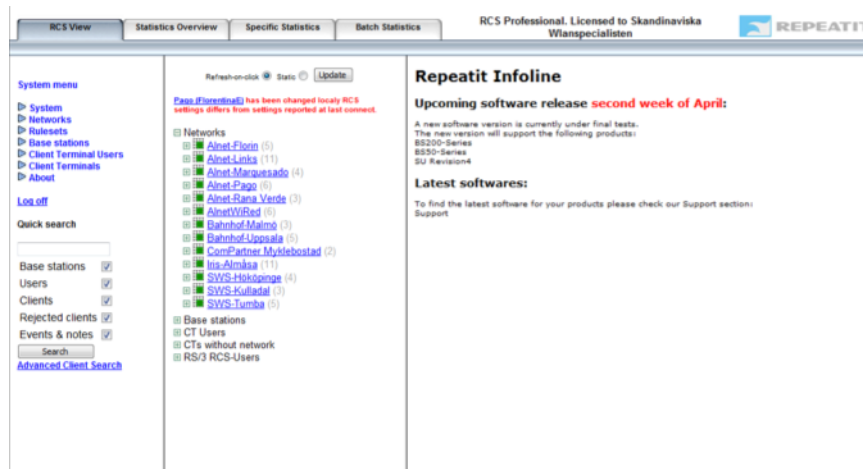
SU123 MIMO - including mast brackets & PoE

23 dBi Dual Poll Antenna

100 Mbit/s

5/10/20/40 MHz channel widths

Easy and fast Multipoint Deployments



The Free-of-Charge Repeatit RCS System is the intelligence of the PMP system. It is mandatory to use the RCS for the initial configuration. After that, it provides a vast amount of functionalities and features like:

- User / Client Authentication to increase security
- Infrastructure Statistics & Bandwidth Management
- Centralized Roll-Out Management
- Network & Alarm Management
- Controlled Firmware Upgrades
- Google Maps Support & Network Hierarchy

Connecting the European Marine Centre

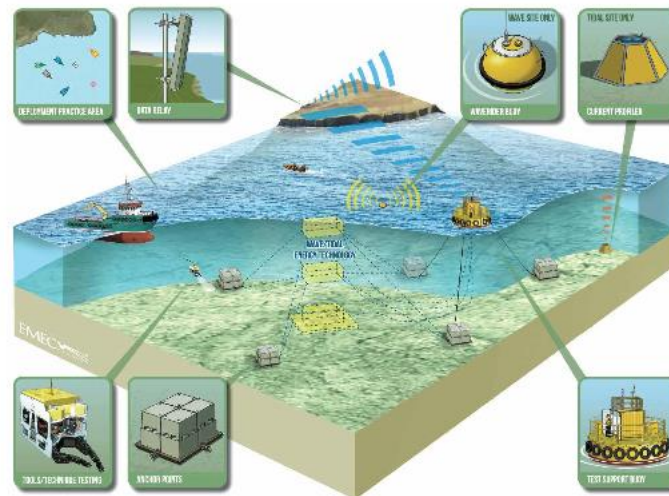


The Challenge:

The European Marine Energy Centre (EMEC) had a requirement to collect real-time data from wave & tidal energy devices from its Orkney Ocean Testing Range located 6 km from the shore on a stationary buoy. Not only did EMEC need to deliver the critical wave & tidal test data from the stationary buoy back to the shore, it also needed to reliably transmit CCTV security images to protect the highly valuable test equipment. EMEC needed a solution capable of sustaining a rock-solid connection and would still work reliably even with the harsh sea environment.

The Solution:

Successful installation of the Trinity323 TDD Offshore IP68 solution connecting the ground stations to the buoy over distances of 6km at sea. Since the installation, EMEC has experienced unmatched wireless reliability with the Repeatit solution successfully transmitting the real-time test, CCTV video & VoIP back to the ground station.



Wireless Last Mile in Italy



The Challenge:

UNO Communication is one of the largest Internet Service Providers in Italy connecting private households and business customers from Genua to the French border. The network is based around the coastline. The main challenge for UNO when choosing a wireless solution was the high hardware reliability in a salty air environment at sometimes extremely hot temperatures. A high robustness against self-created and external interference was another very important criteria.

The Solution:

During the last 10 years, UNO has rolled more than 500 Base Stations, 5000 Subscribers & 180 Point-to-Point Links from Repeatit using the Repeatit RCS as their Main Network Management tool. Interference & Hardware Robustness, Quality of Service for Telephony and various advanced Layer 2 features convinced UNO to work with Repeatit as their exclusive Wireless Hardware Supplier. Next to UNO, Repeatit is globally supplying wireless hardware to more than 100 Wireless ISPs with a total installed base of thousands of Base Stations and Point-to-Point Links.



Wireless Video Surveillance in the UK



The Challenge:

Parking Eye controls customer parking areas throughout the UK. The parking system is highly automated to the point that cameras automatically control when a car arrived and left the parking space and is automatically issuing a fine if a car staid longer than 2 hours. The challenge of Parking Eye was to find a solution that efficiently connects their cameras to transmit high resolution CCTV at the highest reliability possible.

The Solution:

The Repeatit Multipoint Solution in combination with the RCS management system is delivering the advanced features and reliabilities requested by Parking Eye since more than 5 years.



Repeatit's own Wireless Network



Repeatit is one of the very few wireless manufacturer who have their own commercial Wireless Network

More than 400 B-2-B customers in the city of Uppsala in Sweden rely on our Live Network

This guarantees that Repeatit has a direct understanding of the market requirements

New products are always being tested in the Repeatit Network first before being launched



„We can support you not only with hardware & software but with our 13 years of wireless experience“

Asbjörn Frydenlund, CEO