

TETRA LTE MIGRATION DEPLOYING THE MTS4L TETRA/LTE BASE STATION

INTRODUCTION

The combination of TETRA Secure and Resilient Digital Communications with an LTE overlay offers operators and end users a win-win situation. TETRA will continue to meet public safety and mission critical and wideband data needs for the next 10 years or more, LTE roll-out to offer broadband data services. In fact as users become more familiar with the experience of video and rich data on public mobile networks they will come to expect to be able to have this service on secure and resilient networks. Ultimately there will be a call to overlay TETRA networks with a private mobile broadband service and the industry is driving towards standardizing this as LTE.

Motorola is introducing the MTS4L TETRA/LTE base station to make the migration to this dual network as fast and cost effective as possible. Essentially, the cabinet contains a slightly reconfigured 4 carrier MTS4 TETRA Base Station in a 19" rack. There is sufficient space above the TETRA equipment to easily install the eNodeB for LTE service. Although this sounds like an easy conversion, great care and testing has been taken to ensure that the units work well together with no RF or heat dissipation issues. In addition the MTS4L has been tested to Earthquake Region 4 (equivalent to 8 on the Richter scale) seismic conditions. The seismic enforced cabinet is a special orderable option.

The installation of the eNodeB can be done when the MTS4L is initially deployed or at any time thereafter. This is so that the operator has the maximum degree of flexibility in planning the migration.

The deployment of LTE will depend upon several factors such as:

- The availability of frequencies
- Funding
- The business and operational need
- The coverage required for broadband service

Because of these uncertainties the operator can deploy the MTS4L as a TETRA-only base station knowing that where and when they need to add the eNodeB that can do so in a cost effective manner.

The process of adding the eNodeB and switching-on the LTE service is remarkably fast and is completed with the absolute minimum of disruption to TETRA service. Installation typically requires less than 30 minutes and does only requires a simple training session for the installers.

TETRA service remains running during the installation and is only disturbed when the backhaul is briefly disconnected to then be shared with the eNodeB. During this short time the TETRA BTS reverts to Local Site Trunking. Indeed, if redundant site links are provided then there is no disturbance at all to TETRA service.

PREPARATIONS FOR THE LTE INSTALLATION

If the MTS4L is initially installed as a TETRA-only base station it will require services which it will later share with the LTE eNodeB. The floor space is unchanged when the eNodeB is added but there will need to be some planning for power and backhaul. The eNodeB will need its own -48V power supply. In some cases it may be sensible to install a unit with sufficient capacity for both the MTS4L and the eNodeB at the start. The same would be true for battery backup, assuming that LTE service would be required to run in the event of a power failure.

The backhaul needs of the TETRA BTS are relatively modest, typically served by Ethernet or E1. But this changes when LTE service is running, and a link able to handle >100MBit/s is recommended. It may be most convenient to install a high speed link from the beginning, but this depends upon local services and cost.

The trays for the TETRA cabling to the antennas will be shared by the LTE, provision for up to 6 additional cables needs to be added. In addition the antenna mast will need to be able to mount up to 6 panel antennas for the LTE service.

INSTALLING THE ENODEB

The eNodeB weights between 80 and 90Kgms when fully populated with 6 carriers. It is too heavy and dangerous to lift and fit in this configuration. The physical installation therefore follows the following steps.

1. Two temporary supporting brackets are installed into the cabinet to take the weight of the eNodeB during fitting.

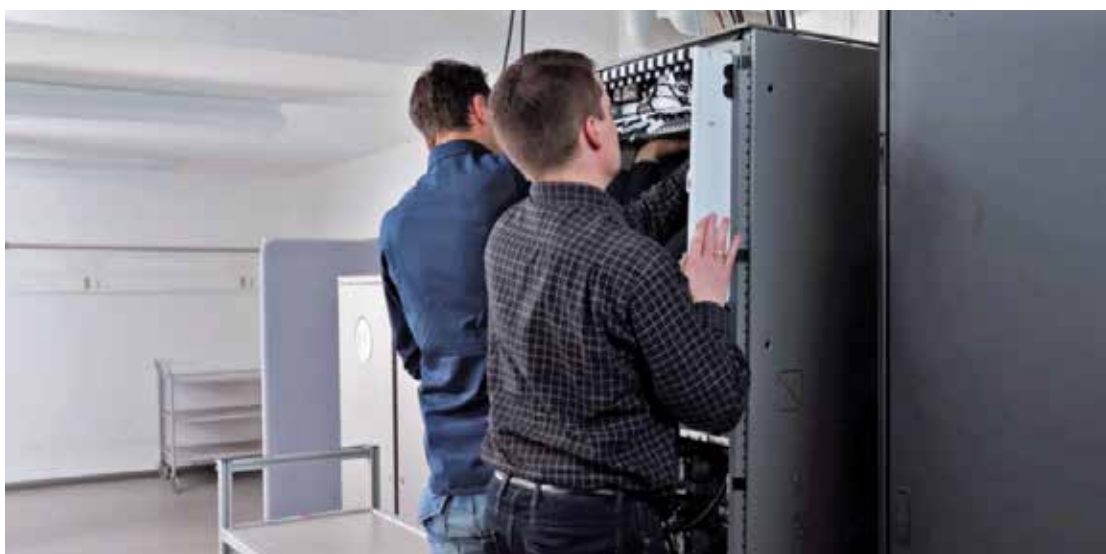


INSTALLING THE ENODEB

2. The LTE radios and other modules are disconnected and removed from the eNodeB “cage” before installation, then the empty cage is lifted into the cabinet and secured.



3. The LTE radios and modules are then reinstalled, and reconnected.



INSTALLING THE ENODEB

4. The -48V power cables are installed at the top of the eNodeB.
The LTE antenna cables are attached.



5. The switch which distributes the backhaul to both the eNodeB and TETRA radios is installed just below the eNodeB.



INSTALLING THE ENODEB

6. The backhaul link to the TETRA BTS is now swapped to the switch, and the switch connected to both the eNodeB and the TETRA BTS.



7. It is at this stage that a brief interruption to trunking and the BTS changes to local site trunking, but as already stated if redundant site links are provided there is no interruption.



The installation is now complete, and the eNodeB will be configured and set to work by the network manager.

For more information on the full range of our solutions, please visit us on the web at:
www.motorolasolutions.com/TETRA