

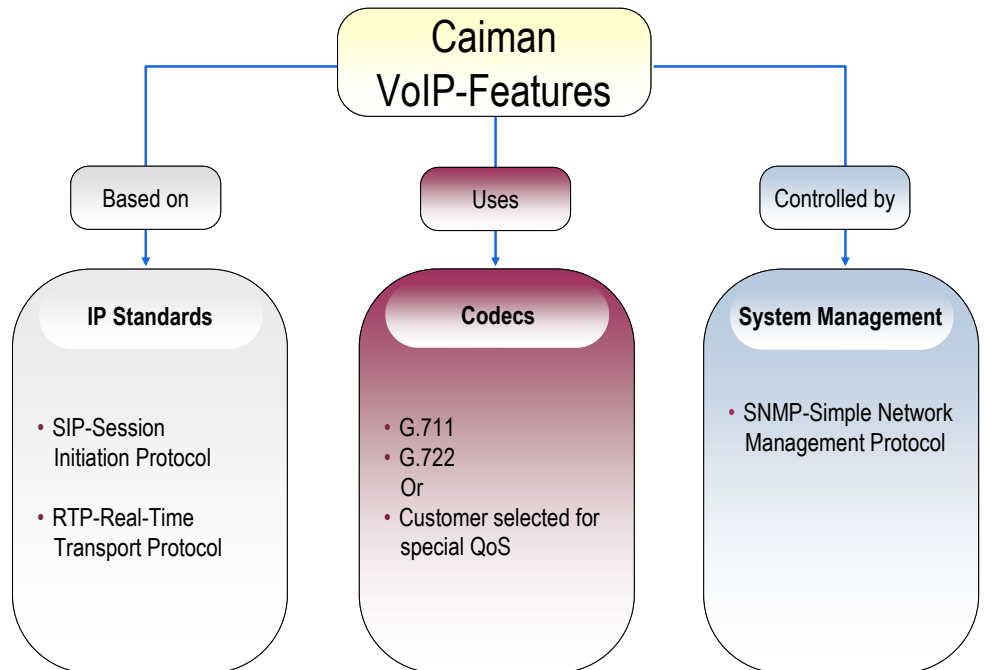
# CAIMAN

## CAIMAN VOICE OVER IP PUBLIC ADDRESS SOLUTIONS USING "TEXT TO SPEECH"

Traditionally, the implementation of a Customer Information System (CIS) and/or a Public Address (PA) System has been carried out independently. Whilst this approach achieved the minimum requirements, the delivery of information was limited.

Further limitations on the effectiveness of PA equipment were also caused by the use of different technologies preventing integration to other systems. This also placed a greater demand on telecommunications infrastructure with PA solutions using dedicated lines into each station and expensive switching systems to manage the delivery of announcements to passengers.

Also, the majority of systems supplied, are designed using proprietary technologies. This has led to increasing annual maintenance costs over the operational life of the system. It has also led to a significant dependency on a small number of suppliers.



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To improve and speed up the delivery of service information, and provide greater flexibility to train operating companies, Funkwerk Information Technologies has developed new functionality within its existing CAIMAN CIS product. This has enabled the complete integration of long line PA and CIS into a single solution using standard IP technology.

The CAIMAN VoIP "Text to Speech" (TTS) enhancement uses the very latest in high quality electronic speech engines. This software replaces the need for high volume pre recorded audio files and reduces long term audio file maintenance and audio data licence fees. Modern intelligent PA routers provided the media that enables the integration of several PA technologies into the same system thus minimising the replacement of existing technologies during system upgrades.

Implementation of the new CAIMAN VoIP TTS enhancement will meet the PA requirements for ninety percent of stations with just the supply of a standard network switch, an intelligent PA router and the required speaker coverage. On larger stations, third party commercially available of the shelf amplifiers can be supplied to expand coverage.

With the implementation of the CAIMAN VoIP “Text to Speech” enhancement, operational personnel are provided with a simple user interface that allows them to make live, pre recorded and/or scheduled announcements to individual stations or to any selected group of stations. All service announcements are also derived from the TTS software ensuring quick and effect alerts to passengers.

The TTS user interface provides an extensive message file, daily scheduler and language processor. Its speech synthesizer can create announcements from words or sentences that have been entered by operational personnel or composed by the CAIMAN CIS application according to any defined rules and actions when issuing automated service announcements e.g. *‘The next train to arrive is the 09:15 First Capital Connect Service to.....’*

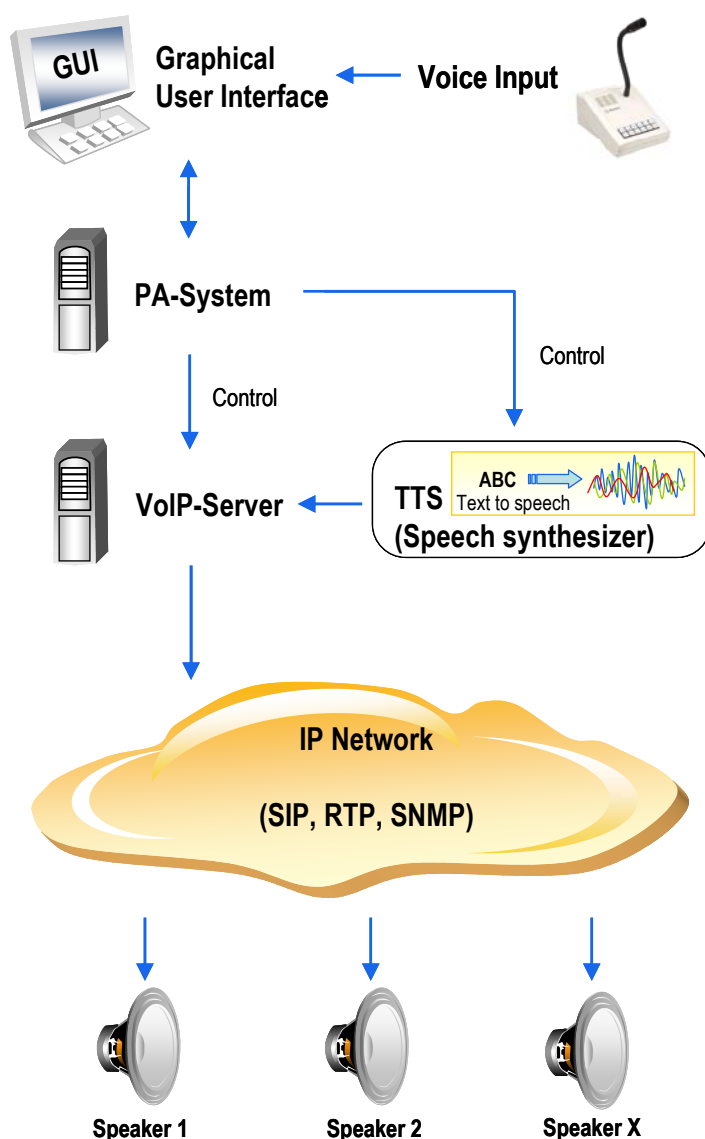
The voice used by the speech synthesizer has been recorded in a studio. These recordings have then been broken down into individually words, phrases, etc and then catalogued for storage in a database. The speech synthesizer is an “Off the Shelf” software application. Its current functionality provides the ability to make announcements in either a male or a female voice and in 14 different languages. Customers can personalise their system by pre recording announcements using existing personnel. These voice files can then be added to the TTS message file. This is ideal for regional accents or dialects.

The implementation of this technology is designed to have a significant impact on the daily activities of operational personnel. In a few seconds an operator can write an announcement, check its content, spelling and grammar, select the destination station(s) and then press a button to broadcast the announcement.

When an announcement is to be made, the CAIMAN server assembles the necessary message in the TTS engine. The server then delivers a voice stream over the IP network to the necessary station(s) using standard protocols. Integration to the special notice editor in the CAIMAN software also allows the delivery of the same message to station display media providing both audio and visual information with one action.

The core Funkwerk CAIMAN software has been designed to utilise the benefits of modern IP media communication. It use three protocols standardised by the Internet Engineering Task Force (IETF) to control the distribution of data. These are:

- the Session Initiation Protocol (SIP) standardised in RFC 3261
- the Real-time Transport Protocol (RTP) standardised in RFC 3550
- the Simple Network Management Protocol (SNMP) standardised in RFC 1157



The SIP is used for defining and managing multimedia communication activities over an IP network. The protocol can be used to create, modify and terminate of single or multi cast activities consisting of one or several media streams.

The RTP defines a standardised packet format for carrying audio or video streams over IP networks. It was designed for multicast applications and predominantly uses the User Datagram Protocol (UDP). With RTP the applications are not as sensitive to packet loss making audio or video streaming far more robust against network failures.

The SNMP is used to monitor the devices attached to network providing immediate maintenance and/or administrative functionality. Typical systems use network management software to monitor the performance of all devices reporting any failures to fault control.