BARTEC VODEC

Networking

Features

- Distributed connection system topology
- High security, each sector supports local PAGA access/operation
- Simple expansion no impact on existing installation
- Eliminates possible common mode failure in event of catastrophic breakdown of master or inter connecting cables

Description

The BARTEC VODEC TQ/VX and TQ-88 system allows the distribution of amplification to remote areas of a petrochemical/industrial site thereby enabling localised drive and management of loudspeaker networks.

A conventional PAGA (Public Address and General Alarm system) broadcast system comprises of central equipment racks with associated loudspeaker circuits radially/loop wired from the central cabinet.

This arrangement works well where loudspeaker networks are located in the immediate vicinity of the central equipment rack however where PAGA broadcast coverage is required to distant/remote site(s) then:

- The reduction in broadcast sound pressure level due to copper losses in the interconnecting loudspeaker cable becomes prohibitive.
- The cost of multi core loudspeaker cable networks increase installation price dramatically.
- The attenuation of network supervisory/test signals due to cable capacitance becomes too high to enable reliable system monitoring. In many cases cable capacitance also degrades speech intelligibility.

The solution to achieving efficient, quality and cost effective PAGA broadcast capability to distant loudspeaker networks is to remote the associated amplification to the vicinity of the target loudspeaker.

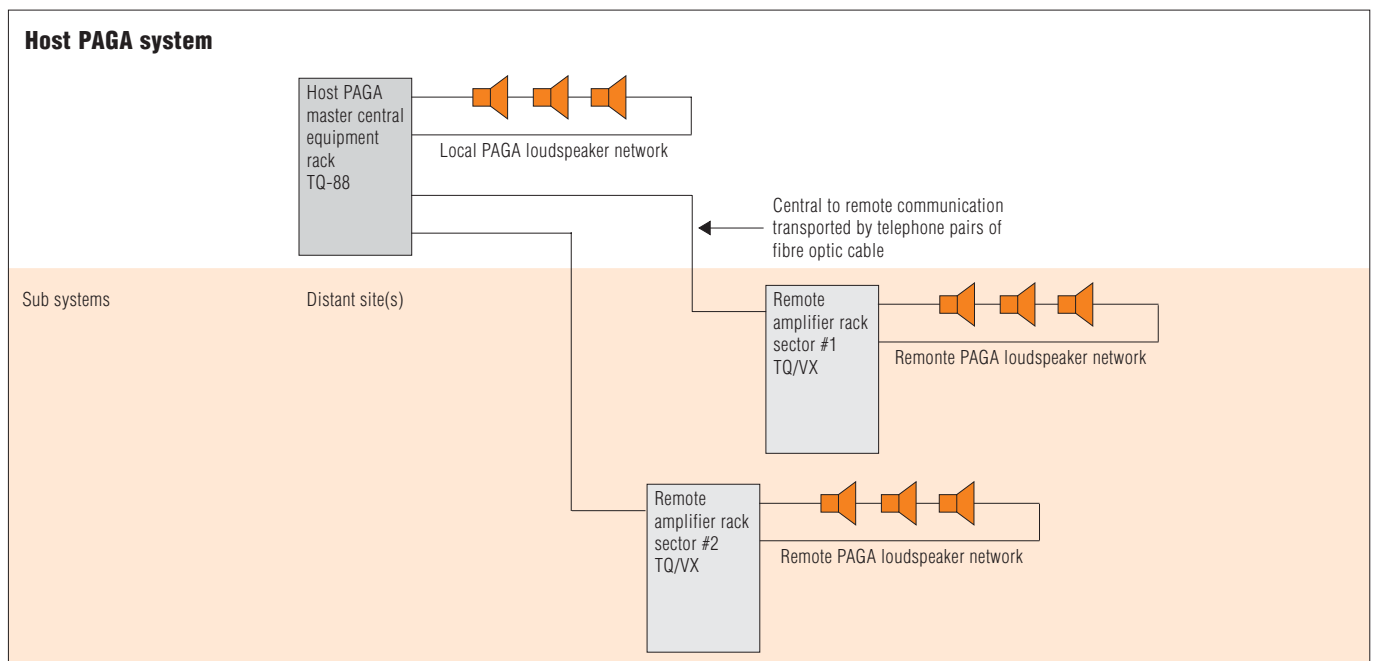## Technical Data

Maximum number of sector slave panels
512

Number of slave panels per VA300/TQ-88
8

Interconnecting cable-copper
3x twisted pairs

Maximum distance
3000 metres min CSA 0.5 mm²
5000 metres min CSA 1.5 mm²

Interconnecting cable-fibre
Single mode 2x fibre using FOP100 interface
1x fibre using FOP200 interface

VA300/TQ-88 connection to host VA300/CAGE
1x 20 way data ribbon cable
1x 16 way audio ribbon cable

Host PAGA system

Host PAGA master central equipment rack TQ-88

Local PAGA loudspeaker network

Central to remote communication transported by telephone pairs of fibre optic cable

Sub systems

Distant site(s)

Remote amplifier rack sector #1 TQ/VX

Remonte PAGA loudspeaker network

Remote amplifier rack sector #2 TQ/VX

Remote PAGA loudspeaker network

In this way the circuits that are required to carry power to loudspeaker devices (e.g. 100 Volts @250 Watts) are kept as short and as direct as possible thereby minimising volt drop, cable capacitance and eliminating costly large cross sectional area multi-core copper cables.

The amplifiers are controlled from the host central rack by either telephone cable pairs or fibre optic cable depending on application/project requirements. The central rack is now the master panel and the remote sector equipment are slave(s).

Where copper cable pairs are utilised for central/ remote inter-connection then the requirement is for a minimum of 3x 0.5 mm² CSA twisted pairs with overall screen.

This cable assignment supports PAGA program broadcast to the remote sector, supervision and amplifier management.

The remote rack(s) derive secure main power supply locally to obviate volt drop.

In the event of fibre optic cable connectivity between control rack and remote sector rack, a single mode fibre is specified.

Depending on project requirement the fibre interface can either be:

- Separate receive/transmit fibre i.e. two fibres
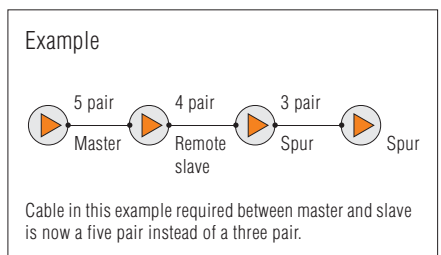
- Or a single duplex fibre connection i.e. one fibre
  The system architecture for a TQ/VX based PAGA package is based on a radial/star wired topology where each slave sector is directly routed to the central master rack

Where spurs are taken from remote sector panels then the spurs are equipped with onboard resources in exactly the same way as the directly connected slaves.

However, a fault report at the TQ-88 central master position will display a common fault condition for any of the conditions for each remote slave panel (including the spur connected panels).

An additional cable pair is required in the cable to each spur to enable retrieval of individual fault report data.

It should be noted that the spurs are not reliant on correct operation of the associated remote slave or any other spur on the same circuit. As long as the connectivity remains intact then mains power supply isolation or equipment breakdown

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Example

5 pair   4 pair   3 pair
Master   Remote   Spur   Spur
         slave

Cable in this example required between master and slave is now a five pair instead of a three pair.

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will have no impact on operation of remaining remote stations.

The distributed system topology of the slave sector panels interconnected by twisted copper cable pairs cannot be replicated in fibre optic cable since interface equipment needed at each remote panel location would make such networks dependant on the correct operation of equipment downstream of the cable.

Catastrophic failure of the remote slave panel (e.g. main supply failure) would also means loss of communication to/from the spur PAGA slave racks.

Hardware execution is as follows: Central master rack – TQ-88 controller slave/spur rack – TQ/VX port.

Central master PAGA rack is fitted with a TQ-88 which enables connection for up to eight remote sector "slave" PAGA racks.

The TQ-88 is a 1 unit high 19 inch rack mount module which carries integral LED status display and IDC ribbon cable plug in/out connectivity.

The TQ-88 communicates with the local VX/AT switch (and also derives power supply from the host system).

TQ/VX port is fitted in the remote slave PAGA rack and this module is supplied with a 1 unit high 19 inch rack mount push button panel (TQ/VX allows supervision of the target amplifier and visual alerts e.g flashing beacons) which are arranged to activate upon initiation of an alarm tone broadcast from the central rack.

The remote sector TQ/VX port not only provides interface to receive PAGA from the central master rack but also carries on board resource to support the host slave and possible local access panel(s).

TQ/VX allows local connection of ICSS/fire and gas detection auto alarm initiate inputs, local VAP operator microphone access unit input as well as interface to other telecom related systems e.g. SCADA fault reporting supervisory.

Here follows a simple block diagram showing possible connectivity at the remote sector location.

Note that standard BARTEC VODEC access panel expansion ports can be used with TQ/VX port enabling multiple safe/hazardous area VAP microphone access and complex ICSS/ fire and gas interface.

Connection diagram

Central master PAGA program input

Possible local inputs

To central rack VA300/TQ-88

Local VAP01 microphone access

ICSS/F&G interface

PABX interface

Fault report

Sector slave rack TQ/VX

Secure mains supply input

Field devices

Loudspeaker loop 1

Loudspeaker loop 2

Flashing beacon loop

Remote sector slave rack