DSPbR® – Trunking Extender

Digital Signal Processor based Repeater

In-building, In-tunnel or Outdoor Coverage Enhancement Repeater
DSPbR Series

The DSPbR® is a compact 19" rack mountable, RF-transparent, digital channel selective repeater. It is fully programmable on a per channel basis, and can provide up to 8 high-power or up to 12 low-power RF off-air bi-directional channels - with up to 3 frequency bands in one chassis. Additional channels or frequency bands can be added by expanding to multiple chassis. Off-air RF linking to the donor network can be utilised, or a chassis can be installed at the donor location with fibre then being used to link to one or more remote chassis. Point-to-point, point-to-multipoint, drop-and-insert, RFOF Summing and Simulcast configurations are all available for implementation.

The Trunking Extender (T-Ex) is a DSPbR option that provides an innovative solution to the rebroadcasting of P25 Phase 1 and Phase 2 networks. The Trunking Extender transcodes the rebroadcast P25 network donor site's Control Channel. The DSPbR-provided coverage footprint is frequency-translated to a different set of frequencies to those of the donor network site, and the transcoded Control Channel data content passing through the DSPbR makes subscriber terminals see the DSPbR as 'another' network site. The use of frequency-translation prevents the occurrence of simulcast overlap between the coverage provided by the network donor site and the DSPbR. It also facilitates achieving the intra-system RF isolation required at a rebroadcast site to prevent the performance degradation that may otherwise occur if identical frequencies were used for both the uplink and downlink RF signal paths (i.e. RF feedback). The transcoding process allows subscriber terminals to hand-over to and from the rebroadcast site coverage as they would between network sites themselves. The Trunking Extender can also be configured to broadcast specific Adjacent Control Channels to enhance subscriber terminals' mobility through the network and rebroadcast coverage areas. Frequency-translation may be configured within one frequency sub-band or across different frequency bands, creating opportunities to utilise any available spectrum in rebroadcast coverage areas - particularly with the increasing availability of multi-band subscriber terminals.

The DSPbR is ideal for in-building, in-tunnel and outdoor coverage enhancement, with its per-channel user-configurable channel frequency and bandwidth, gain, RF output power and other parameters suiting a wide range of deployment applications. The RF-transparent operation of the DSPbR is secure, with network features like traffic channel voice, data, encryption and over-the-air-rekeying and over-the-air-programming being passed unchanged. The Trunking Extender provides a unique deployment solution that allows the rebroadcast of P25 networks to be conveniently implemented – overcoming many of the technical challenges presented by issues such as RF signal dominance, simulcast coverage overlap, and intra-system isolation requirements.

Features:

- Rebroadcasts both P25 Phase 1 and Phase 2
- Supports Trunking and Conventional channels across one or more frequency bands
- Innovative Control Channel transcoding techniques
- Supports in-band or cross-band rebroadcast
- Secure RF-transparent operation – supports traffic channel encryption, OTAR, etc
- Programmable parameters per-channel, and independently in uplink and downlink
- Configurable for RFOF Summing, RF Simulcast, and Fibre connectivity
- Compact 19in rack mounting chassis with DC or AC power supply options

NETWORK SITE
(Donor Site)

Broadcast Control Channel

WACN	781821
SYS ID	306
NAC	363
RFSS	4
SITE ID	85

Advertised Adjacent CC's

RFSS ID	SITE ID
3	14
4	86
4	110

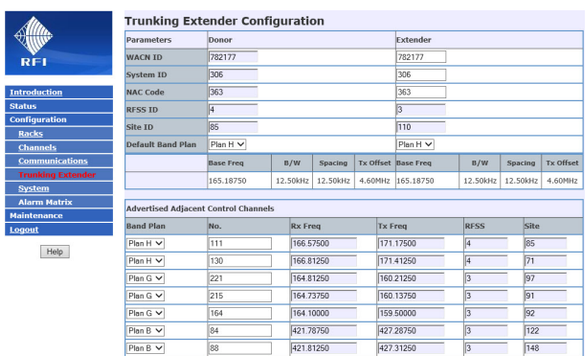
DSPbR REPEATER
(Rebroadcast Site)

Broadcast Control Channel

WACN	781821
SYS ID	306
NAC	363
RFSS	4
SITE ID	110

Advertised Adjacent CC's

RFSS ID	SITE ID
3	14
3	28
4	85



Asia Pacific | EMEA | Americas

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RFI TECHNOLOGY SOLUTIONS

Specifications

Model Number	DSPbR® Series	
Available Frequency Bands (MHz)	132-152, 150-174, 403-420, 410-430, 430-450, 450-470, 470-490, 480-500, 500-520MHz 746-766, 786-806, 805-825, 850-870MHz	
Maximum Channel / Band Capacity	Up to 12 channels/3 bands per chassis, expandable up to 96 chs/8 chassis'	
Supported Protocols	P25 Phase 1 and Phase 2	
Gain Range	70 to 135dB	
RF Output Power	All configurable per-channel in 1dB steps independently in uplink and downlink:	
	APCOP25 Phase 1	Separate RF PA output per channel: VHF/UHF: +10dBm to +45dBm per channel 7/800MHz: +10dBm to +43dBm per channel
		Multi-carrier in a single RF PA: 12 carriers @ +10dBm to +22dBm
	APCO P25 Phase 2	Separate RF PA output per channel: VHF/UHF: +10dBm to +35dBm per channel 7/800MHz: +10dBm to +33dBm per channel
		Multi-carrier in a single RF PA: 12 carriers @ +10dBm to +22dBm
Modes of Operation	Full Duplex, On-Frequency and or Frequency-Translating	
Call and Transaction Types include	Group call, Emergency call, Private call, Private call transmit timeout Continuous assignment updating (late entry), Patching & multiselect, Console priority, Selective radio inhibit, Displaying terminal information (radio check/snapshot), Status list, Location data (tracert), Portal verification, Dynamic FDMA/TDMA emergency alarm and call mode change, Activity log, ATIA feed view, Simultaneous Talkgroup calls FDMA & TDMA at single site, Dynamic FDMA/TDMA Talkgroup call mode change, Duress with regroupable and non-regroupable functionality in patched talkgroups, Console initiated emergency, PSTN/Interconnect calls, OTAR, OTAP	
Trunking Extender Configurable Rebroadcast Data	System ID, RFSS ID, Site ID, Channels/Frequencies/Band Plan Advertised Adjacent Control Channels	
Trunking Extender Channel Parameters	Rx Gating Level, Tx RF Output Power Channel Filter (selectable channel bandwidths and selectivity)	
Alarm Monitoring	Control Channel RSSI	
User Interface	Ethernet (Webserver GUI)	
Configuration and Alarms connectivity	Ethernet / USB / RS232 / Internal Cellular modem	
Alarms Interface (I/O)	via rear DB15 connector	
Regulatory Approvals	ACMA AS/NZS4295 AS/NZS4768, FCC Part 22, FCC Part 90 EN60950-1:2006, AS/NZS60950.1:2011, FCC Part 15 Please contact RFI for details of other approvals	

Note: Please refer to DSPbR Product Datasheet P-42472-2 for additional specifications and features.

Australian Patent No. 2010236015 US Patent No. 8,787,827 US Patent Application No. 62/567,405

Ordering Information

The hardware and software configuration option requirements are likely to be different for most applications. Please contact your nearest RFI office for your specific requirements.