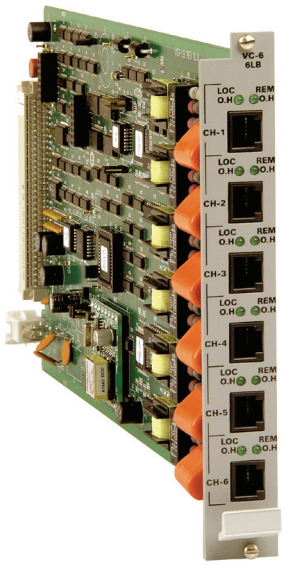
Data Sheet

Megaplex-2100 Modules

VC-6/LB, VC-6/4LB

6/4-Channel PCM Voice Modules for Local Battery Telephones



- Six or four analog voice channels for connection to 2-wire Local Battery (LB) field telephones
- Toll-quality 64 kbps PCM encoding
- Optional inband signaling with A-law encoded channels
- Special 4-channel VC-6/4LB operating opposite remote LB telephones via PBX extensions

Connecting Megaplex to 2-wire Local Battery (LB) field telephones

VC-6/LB and VC-6/4LB modules are user-programmable voice interface modules for connecting Megaplex-2100/2104 to 2-wire local battery-powered (LB) telephones. Each module provides six or four voice channels using toll-quality 64 kbps PCM voice encoding in compliance with ITU-T Rec. G.711 and AT&T Pub. 43801.

The modules connect between LB military field telephones at different remote locations, in a point-to-point topology. Each LB telephone is connected to one module channel. The module digitizes the connected LB telephone's analog voice signal and transfers it over a timeslot assigned for the channel on the Megaplex E1/T1 link. At the receiving LB telephone side, the digital signal is converted back to an analog signal by the remote VC-6/LB or VC-6/4LB module.

Encoding and decoding are in full compliance with ITU-T requirements G.712, G.713 and G.714. Voice channel companding is user-selectable for A-law or μ-law operation.

Each PCM voice channel is allocated a timeslot on the E1/T1 link in a DS0 compatible format, permitting voice channel switching in systems based on digital cross-connect (DACS).

In the basic point-to-point application, LB telephones at one site are connected to LB telephones at another location via the E1/T1 link between the Megaplex units (see *Figure 1*). The main advantage here is that all local/remote pairs of LB telephones communicate via the single Megaplex link, rather than via separate lines.

Special 4-channel VC-6/4LB modules can also operate in PBX mode opposite a remote LB telephone through a PBX extension (see *Figure 2*). This configuration permits communication between the local LB telephones connected to the Megaplex unit, with remote LB or regular telephones, via the PBX extensions.

RAD
data communications
Innovative Access Solutions

VC-6/LB, VC-6/4LB
6/4-Channel PCM Voice Modules for Local Battery Telephones

LB telephones, designed for direct field applications, are always connected whether the receiver is on-hook or off-hook. This can be problematic when the LB telephone is connected to a PBX extension.

For this reason, VC-6/4LB is equipped with an internal timer to send an "on-hook" signal and thereby release the extension. The timer limit is user-set either for 2, 3, or 5 minutes, or for an unlimited period.

Note: *Six-channel VC-6/LB modules can also operate via a PBX extension, as long as the PBX can permanently allocate an extension for the LB line. This PBX extension remains constantly open and functions like a "hotline".*

Three user-selectable signaling transfer modes are available:

- Channel Associated Signaling (CAS) transmitted in Timeslot 16, compatible with ITU-T Rec. G.704 (available for E1 links only);
- Inband "Robbed Bit Multiframe" (RBMF) signaling transfer, compatible with ITU-T Rec. G.704 and AT&T Pub. 43801 (available for T1 links only);
- Proprietary "Robbed Bit Frame" (RBF) signaling, which avoids the need for multiframe synchronization. RBF allocates the least significant bit of each channel to its own signaling information. This proprietary method allows a Megaplex system to transmit 31 voice channels on each E1 link, when using G.732N framing.

Although LB telephones provide their own operating voltage, the VC-6/LB, VC-6/4LB modules require a -48 VDC (nominal) source in order to generate the voltage for ringing the connected LB telephone. The -48 VDC is supplied to the module internally via the Megaplex chassis voltage distribution bus. This power can be provided either from the DC-powered chassis, from external Ringer-2000 or Ringer-2200N power supply units or Ringer-2100R module for AC-powered chassis (see separate data sheet for information on Ringers).

Gain control is soft-adjustable for both the receive and transmit direction, enabling easy installation in all environments.

All operating parameters are configurable via the management system for both the local and remote modules.

Diagnostic features include loopbacks towards the local user equipment and towards the remote user equipment. Test tone injection of 1 kHz, 0 dBm0 towards the remote equipment is also available. Additionally, LED channel activity indicators are provided on the module panel.

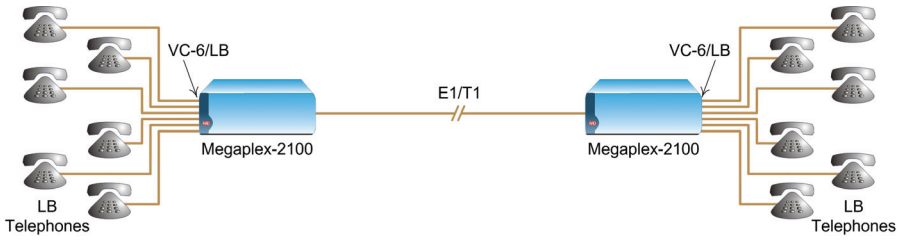


Figure 1. Point-to-Point LB Telephone Connection

Specifications

Number of Voice Channels
VC-6/LB: 6
VC-6/4LB: 4

Voice Digitizing Technique
Modulation: PCM per ITU-T G.711 and AT&T PUB-43801
Companding: μ-law or A-law

Bandwidth Requirement
64 kbps (one timeslot) per enabled channel

Analog Interface
Line type: 2-wire
ITU-T standards: G.713

Analog Parameters
Nominal level: 0 dBm
Nominal impedance: 600Ω
Return loss (ERL) at 300 to 3400 Hz: better than 20 dB
Frequency response (Ref:1020 Hz):
- ±0.5 dB at 300 to 3000 Hz
- ±1.1 dB at 250 to 3400 Hz

Level adjustment (soft-selectable):
- TX: +8 to -17 dBm
- RX: +2 to -23 dBm
- Steps: 0.5 dB (±0.15 dB), nominal

Signal to total distortion (G.713 Method 2):
- -30 to 0 dBm0: better than 33dB
- -45 to +3 dBm0: better than 22dB

Idle channel noise:
better than -65 dBm0 (+25 dBrnc)
Transformer isolation: 1500 VRMS

Ringer
Required DC input: -36 VDC to -72 VDC
Ring signal output: 86 VRMS (when providing 4 REN or less) to 45 VRMS (when providing 12 REN max), 20 Hz (±10%),
2-second signal duration
Overload protected

Timer-controlled Call Duration (VC-6/4LB only)
2, 3, 5 minutes, or unlimited; independently set per channel

End-to-End Signaling
T1 Links:
- Robbed Bit Multiframe signaling:
- 667 samples per second with D4; 333 samples per second with ESF
- Robbed Bit Frame (proprietary) signaling: 8000 samples per second

E1 Links:
- Channel Associated Signaling per ITU-T G.704 para. 3.3.3.2
- Robbed Bit Frame (proprietary) signaling: 8000 samples per sec

Diagnostics
- Local digital loopback for each channel, towards the local user equipment
- Remote analog loopback for each channel, towards the remote user equipment
- 1 kHz, 0 dBm0 test tone injection for one channel at a time, towards the remote user equipment
- Self-test for entire system upon power up

Indicators (per channel)
Remote Off-Hook
Local Off-Hook

Connectors (per channel)
6-pin RJ-11

Configuration
Programmable via the Megaplex management system

Power Consumption
VC-6/LB: 3.5W
VC-6/4LB: 3.25W

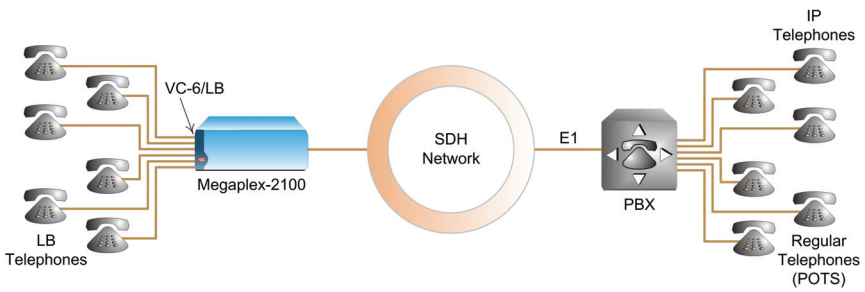


Figure 2. VC-6/4LB Connects LB Telephones to POTS and IP Telephones via PBX Extensions

VC-6/LB, VC-6/4LB

6/4-Channel PCM Voice Modules for Local Battery Telephones

Ordering

MP-2100M-VC-6/LB
6-Channel PCM Voice Module for Local Battery Telephones for MP-2100/2104

MP-2100M-VC-6/4LB
4-Channel PCM Voice Module for Local Battery Telephones with PBX support for MP-2100/2104

OPTIONAL ACCESSORIES

The modules in an AC-powered MP-2100 chassis may require a -48 VDC (nominal) source for feed and ring voltages. This power can be provided by a Ringer-2000/2200N unit or Ringer-2100R module (see *Ringer data sheet* for ordering). -48 VDC-powered chassis, or AC-powered MP-2104 chassis with built-in ringer option, do not require an additional Ringer.

Megaplex Voice Modules

	VC-4/8/16	VC-16A	VC-4-OB	VC-6	VC-6A	VC-6/LB, VC-6/4LB
Number of ports	4/8/16	16	4	6	6	4/6
FXS	✓	✓		✓	✓	
FXO	✓	✓		✓	✓	
E&M	✓	✓	✓	✓	✓	
Local battery						✓
Omnibus			✓			
Polarity reversal & metering	✓				✓	
ADPCM		✓			✓	

International Headquarters
24 Raoul Wallenberg Street
Tel Aviv 69719, Israel
Tel. 972-3-6458181
Fax 972-3-6498250, 6474436
E-mail market@rad.com

North America Headquarters
900 Corporate Drive
Mahwah, NJ 07430, USA
Tel. 201-5291100
Toll free 1-800-4447234
Fax 201-5295777
E-mail market@radusa.com

www.rad.com

RAD data communications
Innovative Access Solutions

764-136-01/07