ORION TELECOM NETWORKS INC.

T1-GSM-24
T1 Channel Bank with 24 x GSM Interface(s)

Product Brochure & Data Sheet

ORION TELECOM NETWORKS INC.

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Product Overview

Orion offers an integrated WAN T1 interface to the GSM mobile communications network. The compact GSM Gateway solution integrates the T1 interface to the GSM network to provide the user with 24, GSM links for mobile communications with an integrated T1 interface.

Applications

T1 GSM Gateway / T1 GSM Channel Bank applications include:

- VoIP, VoATM, VoFR, VPN termination to GSM networks
- DCME E1 / T1 traffic termination directly in GSM network
- Connecting remote (distant) locations over GSM networks
- Providing rural connectivity over GSM networks
- Last mile connectivity over GSM networks
- Quick basic telephony provisioning
- Corporate business fixed to mobile / mobile to fixed
- GSM connectivity for river boats, costal cruise ships
- Fixed network back-up via GSM
- VPN connectivity between two corporate networks
- Mobile back-up solutions for corporate businesses with high security requirements and many more applications.

Our GSM gateway also replaces the cumbersome fixed wireless terminals and provides accurate answer supervision and line disconnect supervision, plus a host of other advantages, which include fast connection times (very short PDD) and high ASR rates that compete with the industry's best. Orion offers both T1 GSM Gateways and E1 GSM Gateways / GSM channel banks.

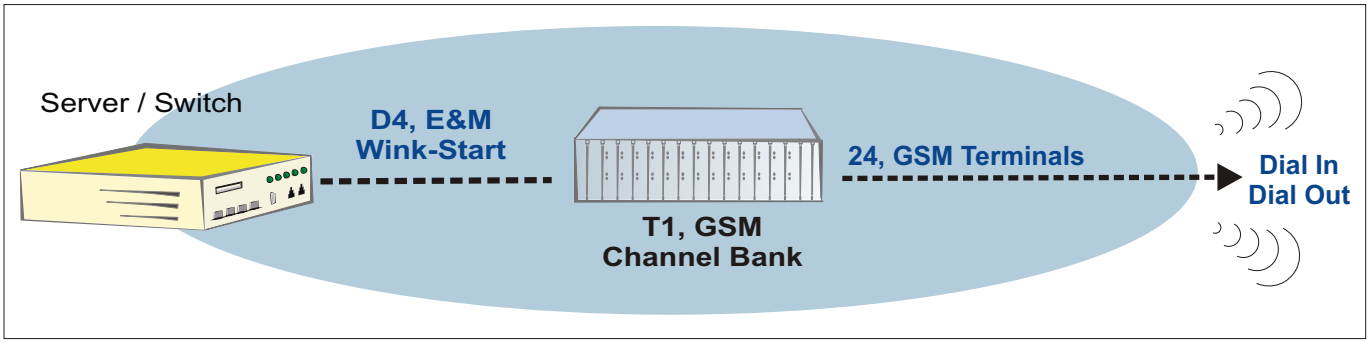
- The interface of the network side is T1 Digital Interface
- The interface on the user side is up to 24 x GSM links
- Accurate answer supervision and disconnect supervision
- Unique caller ID blocking feature (if network allows)
- Remote access monitoring over TCP/IP network - optional
- Unique out-bound calling, user programmable, access feature
- All 24 GSM channels are dual band - 900MHz and 1800MHz with auto-sense / auto-switching capability
- Optionally all 24 GSM channels are dual band - 850MHz and 1900MHz with auto-sense/auto-switching capability.

Features and Highlights

- Compact, 24 GSM terminals in a 19-inch chassis
- Compatible to Cisco AS 53xx, Nuera, Quintum, Clarent VoIP gateways. The GSM interface is integrated to the T1 Interface
- Improved voice quality. The two wire trans-hybrid analog path (present in the Fixed Wireless Terminals) is eliminated in the GSM innovative design, resulting in improved voice quality, clearer voice and superior channel separation by reducing the susceptibility to echoes that result from the analog two wire trans-hybrid VF paths
- Disable caller ID, if allowed by the local GSM Network
- Provides accurate billing information ("answer supervision" and "line disconnect supervision") - not provided by most Fixed Wireless Terminals
- Lower cost - resulting from complete, GSM wireless to T1 integration
- Plug-And-Play. Easy to install. Takes only minutes to install and start service.

Application Diagram

T1-GSM, T1, Channel Bank with 24 X GSM Interfaces



Advantage over fixed wireless Terminals Solutions

Integrated T1 GSM Channel Bank - PROS	Third Party component solutions comprising of T1 Channel Banks and 24 (T1) / 30 (E1) Fixed Wireless Terminals - CONS
1. Integrated and Compact. 24 (T1), or 30, (E1) GSM channels in a compact 6U high, 19-inch rack-mountable shelf.	1. Discreet and poorly managed solution comprising of a channel bank and discreet and 24 (T1)/30 (E1) Fixed Wireless Terminals.
2. Integrated, Single Power Input: -48V DC or AC Mains. Both options are provided.	2. Individual, 24 (T1)/30 (E1) Fixed Wireless Terminals with 30, separate power inputs. Difficult to manage.
3. 3.5dB gain, external antennas with 2 meters RG174 cable and antenna trays. Easy to manage.	3. Absence of External Antennas provides no additional signal gain.
4. Offers Remote and Integrated Graphical User Interface (GUI) Management to monitor all GSM channels. This option allows the USER to view and monitor the status of ALL 24 / 30 GSM channels, including FAULTS on any of the individual GSM channels, remotely, over a TCP-IP network.	4. No management facility to monitor the GSM terminals remotely, or to view the channel or fault status on any of the GSM channels.
5. Integrated, 64ms and 128ms Echo Canceller options. This option allows the USER to install a 64ms/128ms. Echo Canceller in the same 19-inch chassis, to effectively remove any echoes resulting From VoIP and VoFR network delays.	5. No option of ANY Echo-Canceller, which are often essential and required in VoIP and VoATM call termination, owing to unacceptable echoes which often result from network delays.

Advantage over fixed wireless Terminals Solutions

Integrated E1 GSM Channel Bank - PROS	Third Party component solutions comprising of E1 Channel Banks and 24 (T1) / 30 (E1) Fixed Wireless Terminals - CONS
6. Direct T1 Mu Law to GSM conversion, with noise reduction technology. Greatly improves voice quality and voice clarity.	6. Poor coupling of analog lines (from the E1/T1 channel banks) to GSM Fixed Wireless Terminals often results in the analog lines picking up a lot of GSM transmission noise often resulting in unacceptable voice quality and poor quality service.
7. Unique dial-out user programmable Access USER PROGAMMABLE, call directory interface. This optional feature, unique to Orion E1/T1, GSM Multiplexer, allows the USER to program "out-bound" calls (GSM Network to E1 / T1), to be restricted to a list of USER pre programmed numbers only. This feature can be used to provide limited access to out-going calls (GSM Network to E1/T1), on dedicated channels, which the service provider may wish to RESERVE only for its SUBSCRIPTION CUSTOMERS wishing to use out-bound long-distance services (GSM Network to E1/T1). This option also allows the USER to RESTRICT, or to ALLOW all calls originating from the GSM Network to E1/T1 VoIP / VoATM Gateway.	7. No USER PROGRAMMABILITY to RESTRICT or ALLOW calls based a USER PROGRAMMABLE directory. No such feature is provided, or offered in the Fixed Wireless Terminal Channel Bank solution.
8. Accurate CALL METERING resulting from accurate answer-supervision and line-disconnect supervision since the integrated E1/T1, GSM Channel Bank derives its answer-supervision (required for the call-metering function), from the SS7 based GSM Network Signaling / GSM Switch.	8. Unreliable CALL METERING resulting from a battery reversal based, or VAD based (Voice Activated) answer supervision, which is based on analog technology and prone to errors. A VAD based answer supervision offers unreliable CALL METERING, in Comparison with the integrated E1 / T1, GSM Channel Bank which derives its answer-supervision (required for the call-metering function), from the SS7 based GSM Network Signaling/GSM Switch.
9. Greater product reliability. Integration results in greater product reliability and results in less downtime resulting from a low failure rate.	9. Poor product reliability resulting from low integration, poor management and a high number of individual components that are required to be managed (24 or 30 individuals Fixed Wireless Terminals, each with separate power supplies, and the channel bank.

Advantage over fixed wireless Terminals Solutions

Integrated T1 GSM Channel Bank - PROS	Third Party component solutions comprising of T1 Channel Banks and 24 (T1) / 30 (E1) Fixed Wireless Terminals - CONS
10. Low Cost. Integration also results in cost reduction when compared with a component based, discreet solution comprising of a T1/E1 channel bank PLUS 24/30 Fixed Wireless Terminals.	10. Higher cost. The cost appears to be even higher, the absence of any available features, and if poor product management, poor product integration resulting in lower product reliability is taken into consideration.

Technical Specifications

T1 Interface Card

Number of T1 Interfaces	One
Conformity	G.703
Framing	D4
Signaling	D4, Robbed-Bit, E&M Wink-Start Signaling with answer supervision (E&M Wink-Start signaling with answer supervision also offered as an option)
PCM Sampling Rate	8000 samples/second.
Encoding Law	Mu Law
Bit Rate	1544Kbps ± 50ppm
Code	AMI, B8ZS - Selectable
Nominal Impedance	100 Ohms Standard (75 Ohms Optional)
Connector	RJ-45 (100 Ohms Impedance)
Peak Voltage of a mark For 100 Ohms Balanced Interface	3.0 Volt ± 0.3 Volt.
Pulse Mask	As per ITU-T (CCITT) Rec. G.703
Output Jitter	<0.05UI (in the frequency range of 20Hz to 100KHz).
Permissible Attenuation	6dB at 1MHz
Return Loss at: 51.2 KHz to 102.4 KHz. 102.4 KHz to 2048 KHz 2048 KHz to 3072 KHz	 > 12dB > 18dB > 14dB
Jitter Tolerance	As per ITU-T (CCITT) G.823
Loss and Recovery of Frame Alignment	As per Clause 3 of ITU-T (CCITT) G.732
Loss and Recovery of Multi-Frame Alignment	As per Clause 5.2 of ITU-T (CCITT) G.732

Power Supply Card

Input DC voltage	- 48V DC (nominal)
Range of input	- 40V to - 60V DC
Output voltages	+5V
Full Load Output Current	18A@5VDC
Input Voltage Reversal Protection	Provided in the Card
Over Current Protection	20A for +5V
Short Circuit Protection	Current limit - 20A. Recovers on removal of short
Under Voltage	< 4.5V
Over Voltage	5.4V to 5.6V
Efficiency at full load	>80%
Ripple at full load	<5mVrms
Spike at full load	<50mV
Power Consumption	120 Watts (Worst Case)

GSM Access Card

Number of GSM Interfaces	1 ~ 24 (Stackable, 1 thru 24).
Type	Dual Band EGSM 900 MHz/1800 MHz and EGSM 900 MHz/1900 Mhz
Compliance	Compliant with ETSI GSM Phase 2+ standard (Normal MS) Class 4 (2W @ 850/900 MHz) Class 1 (1W @ 1800/1900 Mhz)
Approvals	Fully Type Approved to GSM Standards
SIM Interface Internal Tray	Toolkit Class 2 3V Reader
Voice Features	Full Rate, Enhanced Full Rate And Half-Rate (FR/EFR/HR) all AMR
DTMF	Dual Tone Multi Frequency Function (DTMF) Dialing Support

Alarms

An alarm shall be displayed in LED L1/L2 for the following reasons:

1. Invalid SIM Card
2. Unregistered SIM Card
3. Faulty SIM Card
4. Faulty GSM Module
5. GSM Access Card Out of Range

Echo Canceller Card

• Provides voice echo cancellation of up to 64ms/128ms
• Conforms to ITU-T G.165 and ITU-T G.168
• G.164/G.165 disable tone detection
• Non-Linear Processor with Comfort Noise Insertion
• Narrow-Band Detector
• Eliminates long echo tail

T1 Echo Canceller - T1 Interface (Optional)

Number of Interfaces	2, 1-Input (RJ-45), 1-Output (RJ-45)
Conformity	G.703
Frame Structure	As per ITU (CCITT) G.704
Signaling	D4, E&M Wink-Start Signaling (Option E&M immediate start signaling)
PCM Sampling Rate	8000 samples/sec
Encoding Law	Mu Law as per ITU (CCITT) G.711
Bit Rate	1544 Kbps ± 50 ppm
Code	HDB3
Nominal Impedance	100 Ω balanced
Peak Voltage of a mark For 100 Ω Balanced interface	 3.0 V ± 0.3 V
Peak Voltage of a space for 100 Ω Balanced interface	 0 V ± 0.3 V
Nominal Pulse Width	244 ns
Pulse Mask	As per ITU (CCITT) Rec. G.703
Output Jitter	<0.05 UI (in the frequency range of 20Hz to 100 KHz)
Permissible Attenuation	6 dB at 1 MHz
Return Loss at: 51.2 KHz to 102.4 KHz 102.4 KHz to 2048KHz 2048KHz to 3072 KHz	 > 12dB > 18dB > 14dB
Jitter Tolerance	As per ITU (CCITT) G.823
Loss and recovery of frame alignment	As per clause 3 of ITU (CCITT) G.732
Loss and recovery of multiframe alignment	As per clause 5.2 of ITU (CCITT) G.732

Mechanical Specifications

Rack Mounting	Standard 19-Inch DIN Rack
Height	6U (265 mm)
Depth	290 mm
Width	19-inch (477mm)
Weight	10.5Kgs. (Net)

Ordering Information

S.No.		Part No.	Product Description	Qty
1.	Common Equipment	T1-015	T1 Control Card	**01**
2.		T1-000 / 005	19" Shelf 3U High (Sub-rack) to accommodate 24 Channels with Connectorized Backplane 6U High	**01**
3.		T1-010	(-) 48V DC Power Supply Card	**02**
4.		T1-024	Dual Port GSM Interface Card to connect to connect to the system 12 Cards (max) per system	**12** (max.)
5.		ANT-CABLES	External Antennas Connectorized Cable (2 meters)	**24**
6.		T1-01048-150W	Power Supply (External) AC to DC Converter Portable External Converter Universal AC Input [93V AC-276V AC, 47Hz-63Hz] to DC Output [(-) 48V DC]	**01**

Optional

7.	TCP-IP-MSS100	TCP-IP-MSS100 ethernet remote access module for configuration option allows the user to access, configure and control the T1 Channel Bank equipment over a TCP-IP network. 1 Required for every T1 Shelf	**01**

Notes :

Technical specifications are subject to changes without notice.
All brand names and trademarks are the property of their respective owners.
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