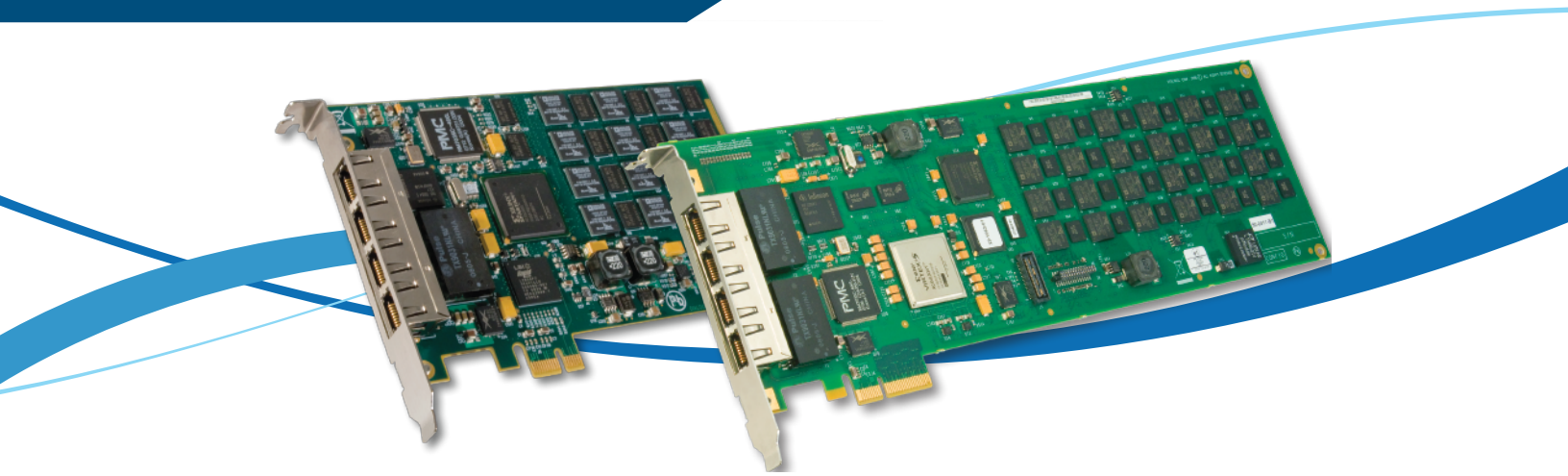
SANGOMA



Revitalize Your Telemetry System with a

Dialogic Diva Solution by Sangoma

As a leading provider of world-class communication technologies, Sangoma offers fully supported high-density digital T1 and E1 modem cards that **can replace industry discontinued modem modules.**

Dialogic Diva V-xPRI series media boards by Sangoma provide key functionality that can be used to build high-density modem banks. With a large suite of supported protocols, the Diva V-xPRI boards by Sangoma are well suited for applications involving the monitoring and termination of utility meter devices.

- Replace end-of-life router modem modules with Dialogic Diva V-xPRI media boards by Sangoma
- Utilize Windows or Linux servers running applications such as Windows RRAS, Linux TTY, COM port and others
- Provide IoT connectivity to Itron products, such as MV-90xi
- Deploy Diva media boards by Sangoma with virtual modem solutions such as the TACServe from Tactical Software

"TACServe" application details can be found on the Tactical Software website

Is Your Cisco Solution Obsolete?

Many companies rely on telemetry systems to meet "mission-critical" operating requirements. If these systems fail, businesses can be seriously impacted.

Digital modem modules widely deployed within Cisco routers will soon be obsolete, with no replacement or support available.

Dialogic Diva Modems by Sangoma Offer Compelling Advantages

Reliable

- Field hardened and fully supported
- Over 200,000 modem ports deployed

Flexible

- Compatible with Windows and Linux servers
- Wide range of protocols suited for utility meter applications

Efficient

- High density modem banks with 240 channels in a single server
- Operates with reduced power and rack space requirements

What is the current situation with Cisco RAS solutions?

The Cisco Digital Modem PVDM2 Modules were digital dial modem modules for use in the Cisco 2800 and 2900 Series Integrated Services Routers for low-density solutions and the 3800 and 3900 Series Integrated Services Routers for higher-density solutions.

Per Cisco, it is no longer possible to purchase PVDM2 Modules (see table below) or to get routine failure analyses for these Modules from Cisco. It is also no longer possible to purchase a new support contract for these Modules, nor to add them to an existing Support contract. Those with a PVDM2 service contract can extend service until August 31, 2018, after which all support services for the product becomes unavailable, and the product becomes obsolete.

Modem Module	Capacity
PVDM2-12DM	12 Port Digital Modem Module
PVDM2-24DM	24 Port Digital Modem Module
PVDM2-36DM	36 Port Digital Modem Module

What is the advantage of Dialogic's Diva solution by Sangoma vs. a Cisco solution (other than the fact that it's not EOL)?

Density is key. In a single system, Diva V-xPRI media boards by Sangoma can support 240 channels of V.90 in a 2U server, versus only 144 in a 3U Cisco router, occupying less rack space and requiring less power. This compounds as higher densities are needed. For example, it would take two 3U Cisco routers (6U total) to support 144 V.90 channels, and only 3U (1 x 2U PC and 1 x 1U PC) using Diva V-xPRI media boards by Sangoma.

Modem Module	Board size	Concurrent calls up to V.32 14.4kbps	Concurrent calls up to V.90 56kbps
Diva V-1PRI HS	Half Length	30	30
Diva V-2PRI HS	Half Length	60	60
Diva V-4 PRI HS	Half Length	120	60
Diva V-4 PRI FS	Full Length	120	120
Diva V-8 PRI FS	Full Length	240	120

Density Comparison

	Cisco Platform	Total Port Density	Diva V-8 PRI FS V.32bis (up to 14.4 kbps)	Diva V-8 PRI FS V.90 (up to 56 kbps)
1U	Cisco 2811 and 2911	72 channels	240 channels	120 channels
2U	Cisco 2821, 2921, 2851, 2951	108 channels	480 channels	240 channels
3U	Cisco 3825, 3925, 3845, 3945	144 channels		

What is typically involved in replacing a Cisco RAS solution with a Dialogic Diva solution from Sangoma?

While each specific situation will differ, in a typical modem deployment scenario, the Cisco router and PVDM2 modem card combination can readily be replaced with a Dialogic Diva V-xPRI Media Board by Sangoma and a server running a routing application such as the Windows RRAS, or Linux tty, or a virtual modem solution such as TACServe from Tactical Software. https://www.tacticalsoftware.com/modem-pool-software/tacserve.htm.

Wondering if a Dialogic Diva solution by Sangoma might be the right replacement solution for you? Here are some questions (and answers) to help with the decision:

Is there already a solution in place today?

If there is, and it uses Analog/T1/E1 for connectivity, please read on. If there is but it uses TCP/IP for connectivity, Diva V-xPRI boards by Sangoma may not be the right fit, as a key benefit of these media boards are their TDM connectivity for modem applications.

If there is already a solution in place today, what issue(s) does a new solution need to address?

If the main issue to address is having a currently supported product, then as noted above the Diva V-xPRI boards by Sangoma can offer help where other products might not. However, with some custom applications, it will take effort to migrate. Also, the Diva V-xPRI boards by Sangoma would not represent a good fit for those who don't want to procure the servers in which they run, nor if there is a need to add SIP/VoIP support.

If there is currently an application for which a replacement is required, is the Modem AT command set used?

If so, the application should migrate to Diva V-xPRI boards by Sangoma seamlessly. If not, the Dialogic Diva API will need to be used to replace the current API. This does mean development is required for a customer to get started with Diva V-xPRI boards by Sangoma. However, this would also likely be true for other options available if looking for a replacement solution originally based on any other custom API.

Is the expectation for a "drop in" replacement, or is it acceptable to involve end customer Development/Engineering resources?

If the application is not using modem AT commands, it may take effort on your part to migrate a custom application to the Diva API. This is highlighted to point out there are two (2) APIs available and each has different level of effort to migrate to:

1. The AT command set (minimal migration effort required)
2. The Diva API (application would need to switch to use these API commands instead of whatever it uses today). This involves more effort.

What density is required from each server?

For 1-2 analog lines, it may be expensive to also purchase a server in which to put the Diva V-xPRI boards by Sangoma in. As the number of channels increases, the proportional cost of the server goes down.

What type of connectivity is required?

Diva supports analog, T1 and E1. The Diva V-xPRI boards by Sangoma do not support SIP/VoIP or TCP/IP.

Are there additional concepts that may help in the replacement decision?

If the following are required, Diva would not be the right migration choice:

- **TCP/IP:** think of this as pure data (i.e., no dial up modem involved). If someone is using TCP/IP, there may not be a need for a Diva modem.
- **NFV:** this means virtualization / software only. Diva boards are hardware products.
- **Virtualization:** this means software only. Diva boards are hardware products that do not work in a virtualized environment.

If the following are required, think "easy migration" to Diva V-xPRI boards by Sangoma:

- **Dial-up:** Means a modem call over a phone line. A Diva V-xPRI board by Sangoma is for the 'server' end of the call. A Diva V-xPRI board by Sangoma would not be placed at the POS to initiate the transaction.
- **Modem pool:** Means the Diva V-xPRI board by Sangoma acts as a pool of modems for another software product (i.e.,TacServe). This can be an easy way to trial/ deploy.

100 Renfrew Drive, Suite 100, Markham ON L3R 9R6 Canada
+1 905 474 1990 or 1 800 388 2475 (toll free in N. America) sales@sangoma.com

SANGOMA TECHNOLOGIES
sangoma.com