One- and 2-Port Serial and Asynchronous High-Speed WAN Interface Cards for Cisco 1800, 1900, 2800, 2900, 3800, and 3900 Series Integrated Services Routers

Cisco® serial and asynchronous high-speed WAN interface cards (HWICs) provide highly flexible connections for Cisco 1800, 1900, 2800, 2900, 3800, and 3900 Series Integrated Services Routers. These HWICS help customers enable applications such as WAN access, legacy protocol transport, console server, and dial access server. Customers can mix and match HWICs to tailor cost-effective solutions for common networking problems such as remote network management, external dial modem access, low-density WAN aggregation, legacy protocol transport, and high-port-density support.

Q. Can you describe these new HWICs?

A. For the Cisco 1800, 1900, 2800, 2900, 3800, and 3900 Series Integrated Services Routers, Cisco offers these four new serial HWICs:

- Cisco 1-Port T1/Fractional T1 DSU/CSU WAN Interface Card (HWIC-1DSU-T1)
- Cisco 1-Port Serial WAN Interface Card (HWIC-1T)
- Cisco 2-Port Serial WAN Interface Card (HWIC-2T)
- Cisco 2-Port Asynchronous/Synchronous Serial WAN Interface Card (HWIC-2A/S)

Q. How are these HWICs different from WIC-1DSU-T1-V2, WIC-1T, WIC-2T, and WIC-2A/S?

A. The new HWICs have the same software features as the older WICs. The HWIC-1T has a Cisco Smart Serial connector where the WIC-1T had a DB-60 connector. The front-end NEBS protection of HWIC-1DSU-T1 has also been improved.

Q. Can different ports on one HWIC be used for different applications?

A. Yes.

Q. Which connectors and cabling are used with these serial HWICs?

A. The HWIC-1T, HWIC-2T, and HWIC-2A/S use the same Cisco Smart Serial connectors and cabling that were used on the WIC-2T and WIC-2A/S. The HWIC-1DSU-T1 will use a RJ-48 T1 cable.

Q. What are the maximum speeds supported on the HWIC interfaces?

A. The HWIC-1DSU-T1 supports a full T1 at 1.544 Mbps. The HWIC-1T and HWIC-2T support up to 8 Mbps on each port. The HWIC-2A/S supports up to 128 kbps on each port. The HWIC-1T, HWIC-2T, and HWIC-2A/S support asynchronous speeds up to 115.2 kbps.

Q. Can the HWIC-2T run at 8 Mbps on both ports?

A. Yes.

Q. Can the integrated services routers run four HWIC-2T all at 8 Mbps on every port?

A. Yes. The configuration is limited only by the total system throughput and the number of available HWIC slots.

Q. Which routers support these HWICs?

A. These HWICs are supported on the Cisco 1841 and the Cisco 1900, 2800,2900, 3800 and 3900 Series Integrated Services Routers.

Q. Are these HWICs supported on the Cisco 1600, 1700, 2600, 3600, or 3700 Series Integrated Services Routers?

A. No.

Q. Which protocols are supported by the HWIC-1T, HWIC-2T, and HWIC-2A/S?

A. EIA-232, EIA-449, V.35, and X.21 are supported in DTE or DCE mode, and EIA-530 and EIA-530A are supported in DTE mode.

Q. Are any features missing from these HWICs?

A. No support is available for the Airline Product Set (ALPS) and Unisys TS (UTS). For ALPS support, please use the NM-4A/S, NM-8A/S, or NM-16A/S.

Q. Do these HWICs offer any new features?

A. Yes, the following are new features:

- The HWIC-1T now has a Cisco Smart Serial or 5-in-1 connector.
- Higher synchronous speeds up to 256 kbps.
- More robust front-end protection on the HWIC-1DSU-T1

Q. Do HWIC-1T, HWIC-2T, and HIWC-2A/S support the “lead manipulation” feature?

A. No.

Q. Do HWIC-1T, HWIC-2T, and HWIC-2A/S support the “Network Clock Synchronization” feature?

A. No.

Q. What are the speed and distance limitations?

A. Signals can travel a limited distance at any given bit rate; generally, the slower the data rate, the greater the distance. Table 1 shows the standard relationship between baud rate and maximum distance. These speed and distance limitations depend on ideal cable and signaling characteristics. Because of this dependency on external factors, the new HWICs are not guaranteed to operate at these speeds and distances.

Table 1. EIA/TIA-232 Speed and Distance Limitations*

Data Rate (Baud)	Distance (Feet)	Distance (Meters)
2400	200	60
4800	100	30
9600	50	15
19,200	50	15
38,400	50	15
57,600	25	7.6
115,200	12	3.7

The use of balanced drivers allows EIA/TIA-449 signals to travel greater distances than the EIA/TIA-232 standard. Table 2 lists the standard relationship between baud rate and maximum distance for EIA/TIA-449 signals. These limits are also valid for V.35 and X.21.

Table 2. EIA/TIA-449 Speed and Distance Limitations*

Data Rate (Baud)	Distance (Feet)	Distance (Meters)
2400	4,100	1,250
4800	2,050	625
9600	1,025	312

Data Rate (Baud)	Distance (Feet)	Distance (Meters)
19200	513	156
38400	256	78
56000	102	31
T1	50	15

* These speed and distance limitations depend on ideal cable and signaling characteristics. Because of this dependency on external factors, the new HWICs are not guaranteed to operate at these speeds and distances.

Caution: The EIA/TIA-449 and V.35 interfaces support data rates up to 2.048 Mbps. Exceeding this maximum could result in loss of data and is not recommended.

Q. Does the HWIC-1DSU-T1 support a "wet current" configuration?

A. Yes. It is shipped in a "dry" configuration, but jumper J2 can be set for a "wet current" configuration. For more information, please refer to the HWIC-1DSU-T1 hardware installation guide at the following link: http://www.cisco.com/en/US/docs/routers/access/interfaces/ic/hardware/installation/guide/DSU_T1_HWIC.html.

Q. Are any of these modules supported in a carrier card such as NM-2W, NM-1FE2W-V2, or NM-2FE2W-V2?

A. No.

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Printed in USA C67-490366-01 10/09