**CISCO SYSTEMS**

DATA SHEET

SERIAL AND ASYNCHRONOUS HIGH-SPEED WAN INTERFACE CARDS FOR CISCO 1800, 2800, AND 3800 SERIES INTEGRATED SERVICES ROUTERS

Serial and asynchronous high-speed WAN interface cards (HWICs) provide highly flexible connections for Cisco® 1800, 2800, and 3800 series integrated services routers. These HWICs help customers to enable applications such as WAN aggregation, 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.

Cisco Systems® offers five serial and asynchronous HWICs:

1. Cisco 1800/2800/3800 series 4-Port Serial High-Speed WAN Interface Card (HWIC-4T)—Four high-speed serial ports (Figure 1, A)

2. Cisco 1800/2800/3800 series 4-Port Asynchronous/Synchronous High-Speed WAN Interface Card (HWIC-4A/S)—Four low-speed synchronous/asynchronous ports (Figure 1, B)

3. Cisco 1800/2800/3800 series 8-Port Asynchronous/Synchronous High-Speed WAN Interface Card (HWIC-8A/S-232)—Eight low-speed synchronous/asynchronous ports, EIA-232 only (Figure 1, C)

4. Cisco 1800/2800/3800 series 8-Port Asynchronous High-Speed WAN Interface Card (HWIC-8A)—Eight asynchronous EIA-232 ports (Figure 1, D)

5. Cisco 1800/2800/3800 series 16-Port Asynchronous High-Speed WAN Interface Card (HWIC-16A)—Sixteen asynchronous EIA-232 ports (Figure 1, E)

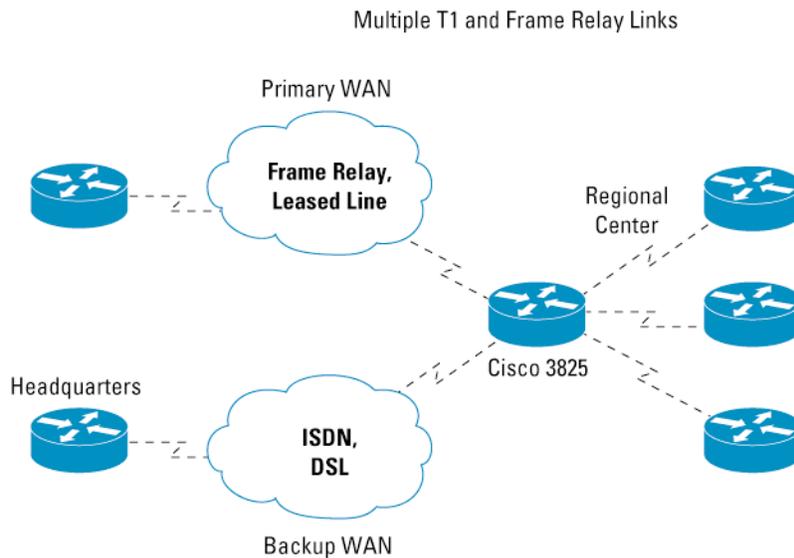**Figure 1.** Serial and Asynchronous HWICs
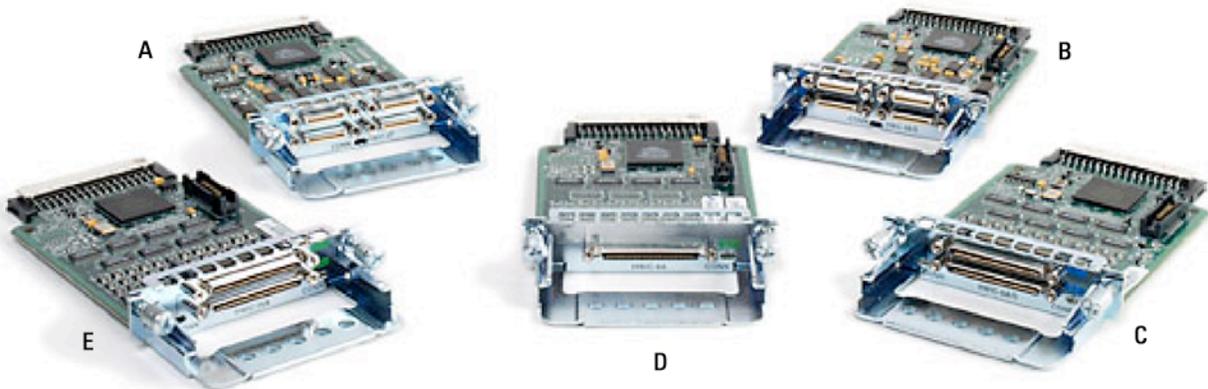
COMMON APPLICATIONS

These highly flexible interface cards enable several important applications.

WAN Aggregation

Serial interfaces can be used to aggregate WAN connection from remote sites. With support for serial speeds up to 8 Mbps per port, the 4-Port Serial High-Speed WAN Interface Card is ideal for low- and medium-density WAN aggregation (Figure 2).

Figure 2. WAN Concentration

Legacy Protocol Transport

Serial and synchronous/asynchronous ports are ideally suited to transport legacy traffic across a TCP/IP network. This enables network convergence (Figure 3), eliminating costly separate leased lines for this traffic. Legacy protocols supported by Cisco IOS® Software include:

- Systems Network Architecture (SNA) and Synchronous Data Link Control (SDLC) Protocol
- Binary Synchronous Communications Protocol (Bisync)
- X.25 Protocol

Figure 3. Network Convergence

Console and Terminal Server

Asynchronous ports provide highly flexible connections that allow access to EIA-232 devices across a TCP/IP network. This allows out-of-band management to console or craft ports, allowing the network operator to manage a network of remote devices from a central location (Figure 4).
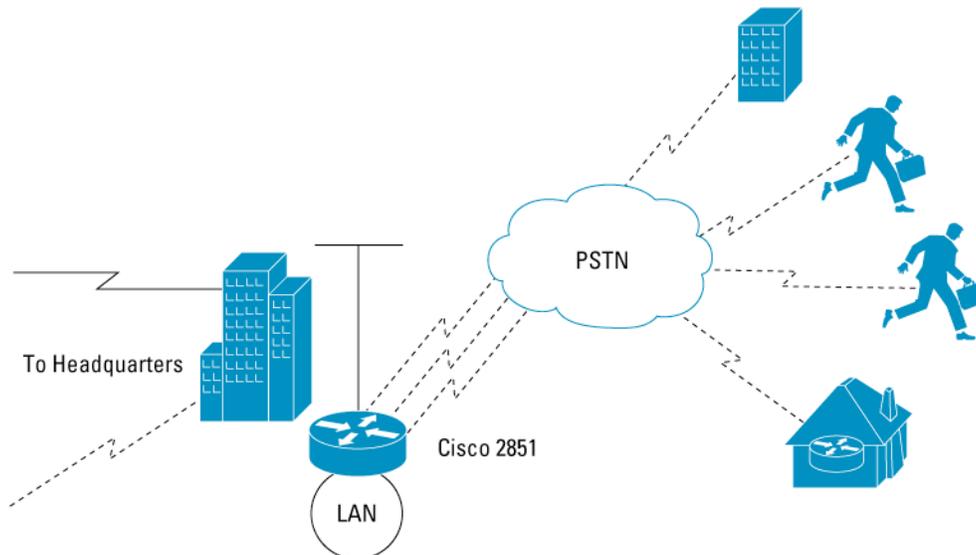
Figure 4.   Managing Multiple Remote Devices From a Single Location
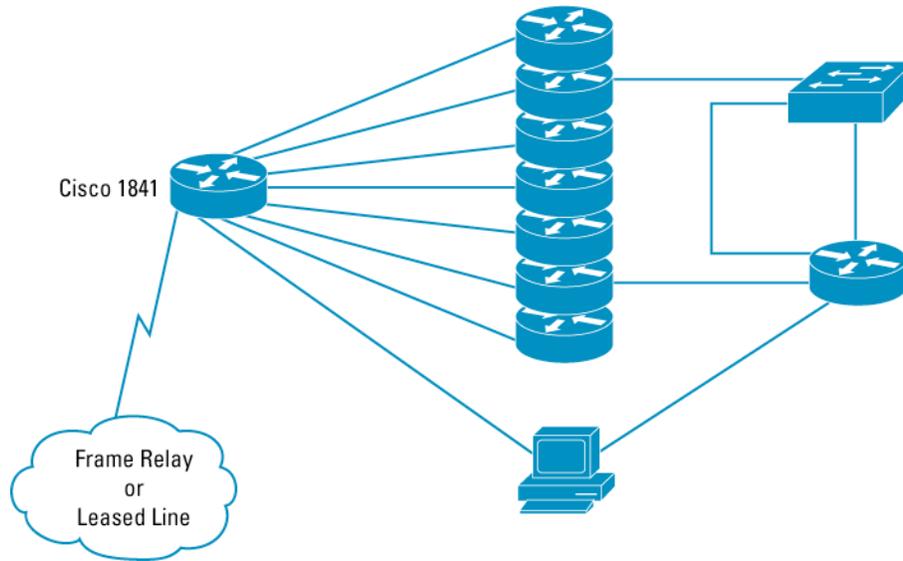
Dial Access Server

Asynchronous HWICs can connect to external dial modems to provide low-density dial access servers (Figure 5).

Figure 5.   Dial Access Server

CONNECTORS AND CABLING

Serial and asynchronous HWICs have connectors and cabling that allow high port densities in the compact HWIC form factor. Tables 1–4 show connector and cabling specifications.

Table 1. Connectors and Cabling

HWIC	Connectors	Available Cables
HWIC-4T, HWIC-4A/S	Smart Serial	See Table 2
HWIC-8A/S-232	High-density 4-port connector	See Table 3
HWIC-8A, HWIC-16A	High-density 8-port connector	High -density 8-port EIA-232 asynchronous cable (CAB-HD8-ASYNC) High-density 8-port asynchronous cable with eight DB-25 modem connectors (CAB-HD8-KIT)

Smart Serial Cabling

The 4-Port Serial High-Speed WAN Interface Card and 4-Port Asynchronous/Synchronous High-Speed WAN Interface Card each have four Smart Serial ports. These ports use the same connectors and cabling as the WIC-2T and WIC-2A/S.

Table 2. Smart Serial Cabling for HWIC-4T and HWIC-4A/S

Product Number	Cable Type	Length	Connector Type
CAB-SS-V35MT	V.35 DTE	10 ft (3m)	Male
CAB-SS-V35FC	V.35 DCE	10 ft (3m)	Female
CAB-SS-232MT	EIA/TIA-232 DTE	10 ft (3m)	Male
CAB-SS-232FC	EIA/TIA-232 DCE	10 ft (3m)	Female
CAB-SS-449MT	EIA/TIA-449 DTE	10 ft (3m)	Male
CAB-SS-449FC	EIA/TIA-449 DCE	10 ft (3m)	Female
CAB-SS-X21MT	X.21 DTE	10 ft (3m)	Male
CAB-SS-X21FC	X.21 DCE	10 ft (3m)	Female
CAB-SS-530MT	EIA/TIA-530 DTE	10 ft (3m)	Male
CAB-SS-530AMT	EIA/TIA-530A DTE	10 ft (3m)	Male

High-Density Synchronous/Asynchronous Cabling

The 8-Port Asynchronous/Synchronous High-Speed WAN Interface Card uses two high-density 4-port connectors. Each connector supports four ports of EIA-232 with data communications equipment (DCE) or data terminal equipment (DTE) interfaces. All four ports on one cable use the same DTE/DCE mode.

Table 3. High-Density Synchronous/Asynchronous Cabling

Product Number	Cable Type	Length	Connector Type
CAB-HD4-232FC	4-port EIA-232 DCE	10 ft (3m)	Female DB-25
CAB-HD4-232MT	4-port EIA-232 DTE	10 ft (3m)	Male DB-25

High-Density Asynchronous Cabling

The 8-Port Asynchronous High-Speed WAN Interface Card and 16-Port Asynchronous High-Speed WAN Interface Card use one (HWIC-8A) or two (HWIC-16A) high-density 8-port connectors. The 8-port asynchronous cable provides the high-density connector on one end and eight RJ-45 plugs on the other. RJ-45- to DB-25 modular adapters are used to convert the RJ-45 to DB-25 DTE or DB-25 DCE connections.

Table 4. High-Density Asynchronous Cabling

Product Number	Cable Type	Length	Connector Type
CAB-HD8-ASYNC	8-port EIA-232	10 ft (3m)	RJ-45
CAB-HD8-KIT	8-port EIA-232 plus eight CAB-25AS-MMOD	10 ft (3m)	Male DB-25
CAB-25AS-MMOD	RJ-45 to DB-25 adapter	–	Male DB-25
CAB-25AS-FDTE	RJ-45 to DB-25 adapter	–	Female DB-25

PLATFORM SUPPORT

Serial and asynchronous HWICs are supported in the HWIC slots of Cisco 1800, 2800, and 3800 series integrated services routers. Table 5 indicates which platforms are supported. These HWICs are supported in all Cisco IOS Software feature sets. The minimum Cisco IOS Software is Release 12.3(14)T.

Table 5. Supported Platforms

HWIC Product Number	1841	2801	2811	2821	2851	3825	3845
HWIC-4T	No	Yes	Yes	Yes	Yes	Yes	Yes
HWIC-4A/S	Yes	Yes	Yes	Yes	Yes	Yes	Yes
HWIC-8A/S-232	Yes	Yes	Yes	Yes	Yes	Yes	Yes
HWIC-8A	Yes	Yes	Yes	Yes	Yes	Yes	Yes
HWIC-16A	No	Yes	Yes	Yes	Yes	Yes	Yes

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SPECIFICATIONS

The specifications of the HWICs are listed in Table 6.

Table 6. HWIC Specifications

Specification	HWIC-4T	HWIC-4A/S	HWIC-8A/S-232	HWIC-8A	HWIC-16A
Synchronous Support	Yes	Yes	Yes	No	No
Synchronous Maximum Speed (per port)	8 Mbps	256 kbps	256 kbps	N/A	N/A
Asynchronous Support	Yes	Yes	Yes	Yes	Yes
Asynchronous Maximum Speed (per port)	230.4 kbps	230.4 kbps	230.4 kbps	230.4 kbps	230.4 kbps
Bisync Support	Yes	Yes	Yes	No	No
Serial Protocols	EIA-232, EIA-449, EIA-530, EIA-530A, V.35, X.21	EIA-232, EIA-449, EIA-530, EIA-530A, V.35, X.21	EIA-232	EIA-232	EIA-232
Lead Manipulation	Yes	Yes	Yes	Yes	Yes
Network Clock Synchronization	Yes	Yes	Yes	No	No

Common Specifications

The specifications listed below are common to all serial and asynchronous HWICs.

Agency Approvals
- UL 1950 (United States)
- CSA-C22.2 #950 (Canada)
- EN60950 (Europe)
- TUV GS (Germany)
- IEC 950 (International)

Immunity
- EN300386
- EN55024/CISPR24
- EN50082-1

Emissions
- FCC Part 15 Class A
- ICES-003 Class A
- EN55022 Class A
- CISPR22 Class A
- AS/NZS 3548 Class A
- VCCI Class A

- EN 300386
- EN61000-3-3
- EN61000-3-2

Physical Specifications

- Single-wide HWIC, no slot restrictions
- Dimensions (H x W x D) 0.8 x 3.1 x 5.6 in. (2.1 x 7.9 x 14.2 cm)

Environmental Specifications

- Operating temperature: 32 to 104°F (0 to 40°C)
- Storage temperature: –4 to 149°F (–20 to 65°C)
- Relative humidity: 10 to 90 percent, noncondensing

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