

U.S. Robotics®



Technical Paper

***V.92: A New International
Standard for Data Access***

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Contents

V.PCM Upstream	2
Quick Connect	2
Modem on Hold	2
Conclusion	3

V.92: A New International Standard for Data Access

With the introduction of x2™ technology in 1997, U.S. Robotics® ushered in a revolutionary change in the ease and availability of Internet data. The subsequent V.90 standard unified the data communications industry in its approach to providing dialup access to remote data. Now the V.92 standard improves the achievements of both x2 and V.90 technologies by making access to the Internet even simpler and less costly.

The new V.92 standard enhances V.90 in three major ways. First, V.92 provides a faster, more balanced upstream to complement the 56 kilobits per second (Kbps) downstream rate found in x2 and V.90 technologies. Second, V.92 defines a mechanism for significantly shortening the dialup connection time. Third, V.92 provides a method for effectively sharing a data line with voice functionality.

V.PCM Upstream

The V.90 standard defined 56 Kbps as the maximum rate for transfers. Unfortunately, this rate was restricted to downloads (transfers from a server or service provider to an individual user). Uploads remained limited to the same maximum speed as V.34 (33.6 Kbps). For users who mostly receive data, this is a minor inconvenience, but V.90 offers limited benefit to users who need to send data to or interact with a service.

V.92 addresses this issue by providing a faster upload path. At the user's discretion, V.92 can be set for a more balanced data transfer rate, with both upstream and downstream speeds up to 48 Kbps. This option allows users to transfer greater quantities of data to a server or service provider. The more balanced rates of V.92 make interactive data communication activities like videoconferencing run more smoothly with a higher level of quality than V.90. The new standard also provides improved download performance; any transfer that requires active acknowledgment will run faster with V.92.

Quick Connect

One of the hidden costs of modem use is the delay incurred by the "training session" modems normally do every time a data connection is established. U.S. Robotics has long sought to minimize this delay, and V.92 continues this effort with its Quick Connect feature.

A V.92 modem "remembers" the connection conditions each time it is used and tests for similar conditions each time it connects. If the conditions match those from the last time the modem was used, V.92 restores the previous connection, cutting 30 to 50 percent off the normal training time.

In the case of a typical desktop computer setup, which often dials the same Internet service provider (ISP) point of presence (POP) from the same phone line every time, this situation will be common. The Quick Connect feature makes occasional use of the Internet much more convenient.

Modem on Hold

The explosive growth of data communications has caused a subtle, but persistent challenge: sharing the phone line. Households have been forced to choose either the continuing expense of a second phone line or the inconvenience of losing access to incoming telephone calls while online. Phone companies offer voice mail services that intercept an incoming call while a user is online; the service indicates who called, but does nothing to prioritize the data-vs.-voice access decision. In short, users have little choice but to stay offline if an important call is expected.

V.92 addresses this issue directly by providing a mechanism to detect inbound calls. A V.92 modem recognizes the standard Call Waiting signaling provided by the phone company and indicates to the user that there is an incoming call. If the phone company provides Caller ID information along with the Call Waiting signal, then this information is also provided to the V.92 modem user. A user who is online can then determine, on a call-by-call basis, whether the inbound call is important enough to interrupt the current online session.

V.92 extends the convenience of this call detection mechanism further by permitting a user to suspend his or her current online session and answer the inbound voice call. This has benefits for both the user and the ISP.

The user gains the ability to answer a voice call while remaining online. When the Call Waiting indication comes on, the user simply opts to answer the call. The user's V.92 modem then negotiates with the Internet service provider's modem and switches the line to the incoming voice call. Once this call is completed, the user can attempt to reestablish a connection with the ISP. The ISP will permit the online session to be resumed as long as the voice call has not exceeded the time limit chosen by the ISP.

The benefit to the service provider is that now phone company signals are handled gracefully on the user's end. When the user wants to answer another call, the ISP is informed by the user's modem. The service provider's modem can either permit or deny the user modem's request. If it accepts the request, then the ISP modem provides a timeout to the user's modem. If the user does not leave the voice call and return to the data connection before the timeout period expires, the ISP modem terminates the call.

With V.90 and older modems, the reaction to a signal like Call Waiting was unpredictable. In many cases, the ISP modem would be forced to renegotiate a connection with the user modem. In extreme cases, the link between the user modem and the ISP

would be lost. To a user who received no indication that a second call was inbound, this appeared as if the service provider had dropped the connection for no reason. V.92 offers a way to clarify, and in many cases eliminate, the confusion that phone company signaling can cause.

Conclusion

V.92 was created to make the use of Internet services more compatible with household phone systems. V.92 modems make using the Internet less of a burden on the household in three valuable ways:

- By providing faster upload speeds, the time required to transmit data is reduced.
- By permitting faster connect times, a V.92 modem makes remote data more readily accessible.
- By being able to recognize and gracefully respond to inbound call signaling, a V.92 modem makes the use of a single phone line for both voice and data practical.

V.92 helps make Internet access fit in with everyday life. It represents the continuing evolution of x2™ technology that U.S. Robotics® pioneered, offering both a refinement of the existing V.90 functions and the addition of a user-friendly set of extensions. Together, these enhancements make adding Internet access to a household an easier decision.

U.S. Robotics will continue to develop solutions to provide data access to consumers. V.92 represents the latest step forward. ◼



About U.S. Robotics

U.S. Robotics is the world's leading modem provider, bringing the Internet into millions of homes and businesses around the world. For three decades, U.S. Robotics has been at the forefront of modem technology, and in the 1990's was the first to boost analog modem speeds to the V.90 56K standard. This year, U.S. Robotics has reemerged as an independent company and will continue its tradition of making the most reliable, simple, and innovative Internet access solutions available. All U.S. Robotics resources — from engineering to customer support — are dedicated to fulfilling that commitment. U.S. Robotics is a privately held company headquartered in the Chicago area.

To learn more about U.S. Robotics products, visit our Web site at www.usr.com.

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