

1. Section 21.23(c)(1) is amended by adding thereto the following:

(viii) Except during the 60 day period provided for in Section 21.27(d), any amendment to an application for a new or modified response station hub or booster that reflects any change in the technical specifications of the proposed facility, includes any new or modified analysis of potential interference to another facility, or submits any interference consent from a neighboring licensee.

2. Section 21.31(a) is amended by revising the first sentence to read as follows:

~~Except with respect to response station hubs and boosters applied for on the same day or during the same window, t~~The Commission will consider applications to be mutually exclusive if their conflicts are such that the grant of one application would effectively preclude by reason of electrical interference, or other practical reason, the grant of one or more of the other applications.

3. Section 21.909(d)(4)(v) should be amended, and a new paragraph (vi) added as follows:

(4) A certification that the application has been served upon

* * *

(v) every licensee of, or applicant for, any cochannel or adjacent channel, authorized or previously proposed ITFS station (including any booster station or response station hub) located within 160.94 km (100 miles) of the proposed response station hub; and

~~(vi) every license of, or applicant for, any non-cochannel or non-adjacent channel ITFS station (including any booster station or response station hub) with one or more registered receive sites within 1960 feet of the proposed response service area.~~

4. Sections 21.909(k) and (n) should be amended as follows:

(k) A response station may be operated unattended. The overall performance of the response station transmitter shall be checked by the hub licensee as often as necessary to ensure that it is functioning in accordance with the requirements of the Commission's rules. The licensee of a response station hub is responsible for the proper operation of all associated response stations and must have reasonable and timely access to all associated response station transmitters. ~~Response stations shall be installed and maintained by the licensee of the associated hub station, or the licensee's employees or agents, and protected in such manner as to prevent tampering~~

~~or operation by unauthorized persons. No response hub may lawfully communicate with any response station which has not been installed by an authorized person, and~~
~~eEach response station hub licensee is responsible for maintaining, and making available to the Commission upon request, a list containing the customer name and site location (street address and latitude/longitude to the nearest second) of each associated response station, plus the technical parameters (e.g., EIRP, emission, bandwidth, and antenna pattern, height, orientation and polarization) pertinent to each specific the class of each response station.~~

* * *

~~(n) Unless otherwise provided, (i) each response station located within a radius of 1960 feet of an ITFS receive site registered and built prior to the filing of the application for the associated response station hub shall be constructed by the licensee of the associated hub station, or the licensee's employees or agents, and (ii) no response station shall be constructed within a radius of 1960 feet of an ITFS receive site registered and built prior to the filing of the application for the associated response station hub unless aAt least one business day 20 days prior to the activation of that a response station transmitter located within a radius of 1960 feet of a registered or previously applied for ITFS receive site, the response station hub licensee notifies must notify, by certified mail, the licensee of the ITFS site of the specific receive site that is within a radius of 1960 feet of the intended response station, the response station hub or hubs with which the intended response station will communicate, and the intention to activate the response station. The notification must contain the street address and geographic coordinates (to the nearest second) of the response station, a specification of the station's EIRP, antenna pattern/orientation/height AMSL, channel(s) to be used, as well as the name and telephone number of a contact person who will be responsible for coordinating the resolution of any interference problems. Such notice shall be given in writing by certified mail, unless the ITFS licensee has requested in writing delivered by certified mail that the response station hub licensee provide notice by electronic mail or facsimile. The provisions of this section shall not apply if:~~

~~(1) the licensee of the ITFS site has consented to the activation of response stations without compliance with these requirements; or~~

~~(2) the response station only will transmit in the 2150-2162 MHz band; or~~

~~(3) the response station will operate at +18 dBW or less, the licensee of the ITFS receive site does not operate co-channel or adjacent channel to the intended response station, and the response station hub licensee has replaced at its expense the downconverter (and where necessary, upgraded reception antennas) at all of the receive sites of the ITFS licensee that were registered and built prior to the filing of the application for the associated response station hub license with downconverters that suppress non-cochannel and non-adjacent channel signals in an amount equal to~~

or greater than +4 dBm minus the downconverter maximum input power capability minus the sum of the power of the desired signals. Any offer to replace downconverters (and where necessary, upgraded reception antennas) shall be extended at with the application for the response station hub. Such an offer shall be deemed accepted unless, within the time afforded for the submission of a petition to deny the application, the ITFS licensee submits an objection that includes demonstrable evidence that the proposed replacement will interfere with acceptable reception at the ITFS receive site.

5. The beginning sentence of Section 21.913(b) should be amended as follows:

(b) An MDS licensee or conditional licensee ~~who is a response station hub licensee, conditional licensee or applicant~~ may secure a license for an MDS signal booster station that has a maximum power level in excess of -9 dBW EIRP (or, when subchannels or superchannels are used, the appropriately adjusted value based upon the ratio of 6 MHz to the subchannel or superchannel bandwidth) and that, if it employs ~~only~~ digital modulation, ~~complies with the~~ uniform power spectral density in accordance with the Commission's *Declaratory Ruling and Order*, 11 FCC Rcd 18839 (1996) (a "high-power MDS signal booster station"). . . .

6. Section 74.911 is amended to read as follows:

(a) Applications for ITFS stations are divided into ~~two~~ three groups:

(1) In the first group are applications for new stations ~~or major changes in the facilities of authorized stations~~. These applications are subject to the provisions of paragraph (c) of this section.

(2) In the second group are applications for ~~major changes in the facilities of authorized stations~~. A major change for an ITFS station will be any proposal to add new channels, change from one channel (or channel group) to another, except as provided for in §74.902(f), change polarization, increase the EIRP in any direction by more than 1.5 dB, increase the transmitting antenna height by 25 feet or more, or relocate a facility's transmitter site by 10 miles or more. Applications submitted pursuant to §§74.939 and 74.985 shall ~~not~~ be considered major change applications. ~~Major change applications are subject to paragraphs (e) and (f) of this section. However, the Commission may, within 15 days after the acceptance of an application, or 15 days after the acceptance of any other application for modification of facilities, advise the applicant that such application is considered to be one for a major change, and subject to the provisions of paragraph (c) of this section.~~

(23) The ~~second~~ third group consists of applications for ~~all other~~ licenses and all other changes in the facilities of authorized stations.

(b) A new file number will be assigned to an application for a new station or for

major changes in the facilities of an authorized station, when it is amended so as to effect a major change, as defined in paragraph (a)(1) of this section, or result in a situation where the original party or parties to the application do not retain control of the applicant as originally filed. An application for change in the facilities of any existing station will continue to carry the same file number even though (pursuant to Commission approval) an assignment of license or transfer of control of such licensee or permittee has taken place if, upon consummation, the application is amended to reflect the new ownership.

(c)(1) (i) The FCC will specify by Public Notice, pursuant to Sec. 73.5002, a period for filing ITFS applications for a new station ~~or for major modifications in the facilities of an authorized station.~~ (ii) Such ITFS applicants shall be subject to the provisions of Secs. 1.2105 and the ITFS competitive bidding procedures. See 47 C.F.R. Secs. 73.5000 et seq.

(2) The requirements of this section apply to a wireless cable entity requesting to be licensed on ITFS frequency pursuant to §74.990 of this Part. The application of such a wireless cable entity shall be included in the Public Notice released after the termination of the filing period.

(d) Those applications, other than mutually exclusive applications ~~for new stations~~, which upon examination meet other pertinent requirements and would serve the public interest, convenience and necessity will be granted. ~~Mutually exclusive applications will be processed pursuant to the provisions in §74.913.~~

(e) Notwithstanding any other provisions of this Part, effective as of September 17, 1998, there shall be one-week window, at such time as the Commission shall announce by public notice, for the filing of ~~major change applications for high-power signal booster station, response station hub, and I channels point-to-multipoint transmissions licenses~~, during which all applications shall be deemed to have been filed as of the same day ~~for purposes of §§74.939 and 74.985~~. Following the publication of a public notice announcing the tendering for filing of applications submitted during that window, applicants shall have a period of sixty (60) days to amend their applications, provided such amendments do not result in any increase in interference to any previously proposed or authorized station, or to facilities proposed during the window, absent consent of the applicant for or conditional licensee or licensee of the station that would receive such additional interference. At the conclusion of that sixty (60) day period, the Commission shall publish a public notice announcing the acceptance for filing of all applications submitted during the initial window, as amended during the sixty (60) day period. All petitions to deny such applications must be filed within sixty (60) days of such second public notice. On the sixty-first (61st) day after the publication of such second public notice, applications for ~~new or modified response station hub and booster station licenses~~ ITFS major change applications may be filed and will be processed in accordance with the provisions of ~~§§74.939 and 74.985~~ paragraph (f) of this section.

~~Notwithstanding §74.911(d),~~ Each application submitted during the initial window shall be granted on the sixty-first (61st) day after the Commission shall have given such public notice of its acceptance for filing, unless prior to such date either a party in interest timely files a formal petition to deny or for other relief pursuant to §74.912, or the Commission notifies the applicant that its application will not be granted. Where an application is granted pursuant to the provisions of this paragraph, the conditional licensee or licensee shall maintain a copy of the application at the transmitter site or response station hub until such time as the Commission issues a license.

(f) ~~Except as provided in paragraph (e), major change applications may be filed at any time. Except during the 60 day period provided for in paragraph (E), any amendment to a major change application that reflects any change in the technical specifications of the proposed facility, includes any new or modified analysis of potential interference to another facility, or submits any interference consent from a neighboring licensee, shall be considered newly-filed. Notwithstanding any other provision of Part 74, major change applications meeting the requirements of Part 74 shall cut-off applications that are filed on a subsequent day for facilities that would cause harmful electromagnetic interference to the proposed response station hubs. A response station hub shall not be entitled to protection from interference caused by facilities proposed on or prior to the day the application for the response station hub license is filed. Response stations shall not be required to protect from interference facilities proposed on or after the day the application for the response station hub license is filed. Except as provided by paragraph (e), any petition to deny a major change shall be filed no later than the sixtieth (60th) day after the date of public notice announcing the filing of such application or major amendment thereto. Except as provided in paragraph (e), an application for a response station hub license that meets the requirements of Part 74 this section shall be granted on the sixty-first (61st) day after the Commission shall have given public notice of the acceptance for filing of it, or of a major amendment to it if such major amendment has been filed, unless prior to such date either a party in interest timely files a formal petition to deny or for other relief pursuant to §74.912, or the Commission notifies the applicant that its application will not be granted. Where an application is granted pursuant to the provisions of this paragraph, the conditional licensee or licensee shall maintain a copy of the application at the response station hub until such time as the Commission issues a response station hub license.~~

7. Section 74.912(a) is amended to read as follows:

(a) Any party in interest may file with the Commission a petition to deny any application for new facilities or major changes in the facilities of authorized stations, provided such petitions are filed by the date established pursuant to the cut-off provisions of §74.911(c), (d) and (f). In the case of all other applications, except those excluded under Section 309(c) of the Communications Act of 1934, as amended, ~~and except as provided in §§74.939 and 74.985,~~ petitions to deny must be

filed not later than 30 days after issuance of a public notice of the acceptance for filing of the applications. In the case of applications for renewal of license, petitions to deny may be filed after the issuance of a public notice of acceptance for filing of the applications and up until the first day of the last full calendar month of the expiring license term. Any party in interest may file with the Commission a petition to deny any notification regarding ITFS booster stations within the 60 day period provided for in §74.985(e).

8. Section 74.931(c)(3) should be amended to read as follows:

(3) The licensee may shift its requisite ITFS educational usage onto fewer than its authorized number of channels, via channel mapping or channel loading technology, so that it can lease full-time channel capacity on its ITFS station, associated ITFS booster stations, and/or ITFS response stations and associated response station hubs, subject to the condition that it provide a total average of at least 20 hours per channel per week of ITFS educational usage on its authorized channels. If the licensee leases capacity to an operator which utilizes digital transmissions, it may shift its requisite ITFS educational usage onto channels not authorized to it, but which are included in the wireless system of which it is a part ("channel shifting"), so that it can lease full-time channel capacity on its ITFS station, associated ITFS booster stations, and/or ITFS response stations and associated response station hubs, subject to the condition that it provide a total average of at least 20 hours per licensed channel per week of ITFS educational usage. The use of channel mapping or, channel loading and/or channel shifting consistent with the Rules shall not be considered adversely to the ITFS licensee in seeking a license renewal. The licensee also retains the unabridgeable right to recapture, subject to six months' advance written notification by the ITFS licensee to its lessee, an average of an additional 20 hours per channel per week, accounting for all recapture already exercised. The licensee may agree to the transmission of this recapture time on channels not authorized to it, but which are included in the wireless system of which it is a part.

9. Section 74.939(d)(4)(v) should be amended, and a new paragraph (vi) added as follows:

(4) A certification that the application has been served upon

* * *

(v) every licensee of, or applicant for, any cochannel or adjacent channel, authorized or previously proposed ITFS station (including any booster station or response station hub) located within 160.94 km (100 miles) of the proposed response station hub; and

(vi) every licensee of, or applicant for, any non-cochannel or non-adjacent channel ITFS station (including any booster station or response station hub) with one or more registered receive sites within 1960 feet of the proposed response service

area.

10. Sections 74.939 (e) and (f) should be deleted and paragraphs (l), (m) and (p) be amended to read as follows:

(l) Any MDS or ITFS conditional licensee or licensee who wishes to use one or more of its associated I channels for point-to-multipoint transmissions in a system with one or more authorized, or previously or simultaneously proposed, response station hub(s) shall:

(1) File an application with the Commission, using FCC Form 304 for I channels associated with an MDS station and filing with Mellon Bank in accordance with §1.1104, or using FCC Form 330 for I channels associated with an ITFS station and filing with the Commission in Washington, DC. The application shall specify which of the associated I channels is/are intended for point-to-multipoint transmissions. The applicant also shall certify on the appropriate form that it has complied with the requirements of §74.939(1)(2). Failure to certify compliance and to comply completely with the requirements of §74.939(1)(2) shall result in dismissal of the application or revocation of the authorization for point-to-multipoint transmissions on the relevant I channels, and may result in imposition of a monetary forfeiture. Modification applications to convert I channels associated with ITFS stations to point-to-multipoint transmissions shall be considered ~~minor~~ **major** changes for purposes of §74.911. These applications shall be subject to the procedures set forth in §21.27(d) or §74.911(e) ~~and (f)~~, as appropriate; and

* * *

(m) A response station may be operated unattended. The overall performance of the response station transmitter shall be checked by the hub licensee as often as necessary to ensure that it is functioning in accordance with the requirements of the Commission's rules. The licensee of a response station hub is responsible for the proper operation of all associated response stations and must have reasonable and timely access to all station transmitters. ~~Response stations shall be installed and maintained by the licensee of the associated hub station, or the licensee's employees or agents, and protected in such manner as to prevent tampering or operation by unauthorized persons. No response hub may lawfully communicate with any response station which has not been installed by an authorized person, and e~~Each response station hub licensee is responsible for maintaining, and making available to the Commission upon request, a list containing the customer name and site location (street address and latitude/longitude to the nearest second) of each associated response station, plus the technical parameters (e.g., EIRP, emission, bandwidth, and antenna pattern, height, orientation and polarization) pertinent to ~~each specific~~ **the class of each** response station.

* * *

(n) Unless otherwise provided, (i) each response station located within a radius of 1960 feet of an ITFS receive site registered and built prior to the filing of the application for the associated response station hub shall be constructed by the licensee of the associated hub station, or the licensee's employees or agents; and (ii) no response station shall be constructed within a radius of 1960 feet of an ITFS receive site registered and built prior to the filing of the application for the associated response station hub unless ~~at least one business day 20 days~~ prior to the activation of that a response station transmitter located within a radius of 1960 feet of a registered or previously applied for ITFS receive site, the response station hub licensee ~~notifies~~ must notify, by certified mail, the licensee of the ITFS site of the specific receive site that is within a radius of 1960 feet of the intended response station, the response station hub or hubs with which the intended response station will communicate, and the intention to activate the response station. ~~The notification must contain the street address and geographic coordinates (to the nearest second) of the response station, a specification of the station's EIRP, antenna pattern/orientation/height AMSL, channel(s) to be used, as well as the name and telephone number of a contact person who will be responsible for coordinating the resolution of any interference problems. Such notice shall be given in writing by certified mail, unless the ITFS licensee has requested in writing delivered by certified mail that the response station hub licensee provide notice by electronic mail or facsimile. The provisions of this section shall not apply if:~~

(1) the licensee of the ITFS site has consented to the activation of response stations without compliance with these requirements; or

(2) the response station only will transmit in the 2150-2162 MHz band; or

(3) the response station will operate at +18 dBW or less, the licensee of the ITFS receive site does not operate co-channel or adjacent channel to the intended response station, and the response station hub licensee has replaced at its expense the downconverter (and where necessary, upgraded reception antennas) at all of the receive sites of the ITFS licensee that were registered and built prior to the filing of the application for the associated response station hub license with downconverters that suppress non-cochannel and non-adjacent channel signals in an amount equal to or greater than +4 dBm minus the downconverter maximum input power capability minus the sum of the power of the desired signals. Any offer to replace downconverters (and where necessary, upgraded reception antennas) shall be extended at with the application for the response station hub. Such an offer shall be deemed accepted unless, within the time afforded for the submission of a petition to deny the application, the ITFS licensee submits an objection that includes demonstrable evidence that the proposed replacement will interfere with acceptable reception at the ITFS receive site.

11. Section 74.985 shall be amended by revising the first sentence paragraph (b) to read as follows and by deleting paragraphs (c) and (d):

(b) An ITFS licensee or conditional licensee ~~who is a response station hub licensee, conditional licensee or applicant~~ may secure a license for an ITFS signal booster station that has a maximum power level in excess of -9 dBW EIRP (or, when subchannels or superchannels are used, the appropriately adjusted value based upon the ratio of 6 MHz to the subchannel or superchannel bandwidth) and that, if it employs ~~only~~ digital modulation, ~~complies with the~~ uniform power spectral density in accordance with the Commission's *Declaratory Ruling and Order*, 11 FCC Rcd 18839 (1996) (a "high-power MDS signal booster station"). . . .

12. Section 74.931(c)(1) is amended to read as follows:

(1) Before leasing excess capacity on any one channel, the licensee must provide at least 20 hours per week of ITFS educational usage on that channel, except as provided in paragraph (c)(2) of this section. An additional 20 hours per week per channel must be strictly reserved for ITFS use and not used for non-ITFS purposes, or reserved for recapture by the ITFS licensee for its ITFS educational usage, subject to one year's advance, written notification by the ITFS licensee to its lessee and accounting for all recapture already exercised, with no economic or operational detriment to the licensee. These hours of recapture are not restricted as to time of day or day of the week, but may be established by negotiations between the ITFS licensee and the lessee. This 20 hours per channel per week ITFS educational usage requirement and this recapture and/or reservation requirement of an additional 20 hours per channel per week shall apply spectrally over the licensee's whole ~~actual protected~~ service area.

13. Section 74.931(d)(1) is amended to read as follows:

(1) The licensee must reserve a minimum of 5% of the capacity of its channels for instructional purposes only, and may not lease this reserved capacity. In addition, before leasing excess capacity, the licensee must provide at least 20 hours per licensed channel per week of ITFS educational usage. This 5% reservation and this 20 hours per licensed channel per week ITFS educational usage requirement shall apply spectrally over the licensee's whole ~~actual protected~~ service area.

EXHIBIT 1



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Harris Demonstrates Cost-Effective Wireless Internet Link

Aurora/Entrata Link Fast, Low Cost Compared to Wireline

Atlanta, Georgia June 9, 1998, SUPERCMM '98 Booth #4609 - Harris Corporation (NYSE: HRS), a world leader in the manufacture of microwave radio equipment and services, will demonstrate today at SUPERCMM '98 a low-cost link that can transmit wireless Internet and digital video up to 30 times faster than today's modems.

The Harris Aurora 2400 spread spectrum radio interfaced with the Entrata Communications Corporation's MSA 100 multi-service access device replaces the need to lease wire lines. This reduces the Aurora 2400 payback period to a matter of months, depending upon leased line rates. It easily supports wide-area network (WAN) and Internet traffic for distances of up to 30 miles, depending upon permissible output power levels and regional regulations. The Entrata MSA 100 additionally permits the Aurora/Entrata link to transmit low speed ATM traffic and serve as an extension of xDSL networks. The link's cost-effectiveness, reliability and easy implementation make it an excellent choice both as a replacement for existing wireline service and as an alternative to new lines, especially in areas not easily serviced by wireline infrastructure.

At its SUPERCMM booth, Harris will display a simultaneous wireless digital video and Internet transmission at T1 rate (1.5Mb/s). The link will transmit full motion video provided by a multimedia server while at the same time transmitting a live Ethernet-based Internet connection.

"Our new wireless access link offers a very practical, cost-effective alternative to leased lines for the quickly expanding Internet and enterprise network marketplace," said Richard Peabody, Harris Corporation, Farinon Division's vice president and general manager. "Service providers and enterprise customers will be able to rapidly implement reliable voice, video, and data links, or alternatively translate this traffic for transport on an ATM backbone."

The Aurora 2400's compact design allows simple, completely indoor (excepting the antenna) installation. Its easy installation permits a variety of applications, such as private wireless networks, local- and wide-area networks, Internet access, cellular and PCS/PCN radio systems and government, mobile and emergency services. By operating in the unlicensed 2.4 GHz Industrial, Scientific and Medical (ISM) band, Aurora requires no frequency coordination or licensing in most countries.

The Entrata MSA 100 multi-service access device offers high-speed performance in support of voice, video and data applications and consolidation of their transfer. It also integrates digital subscriber line (xDSL) and low-speed asynchronous transfer mode (ATM) technologies, with integral routing support. Highly manageable, the Entrata MSA 100 permits either SNMP management with remote software upgrades or Web-based management and configuration support.

For current product information, visit the company's Web site at <http://www.farinon.harris.com>. Please note, the Aurora 2400 is undergoing acceptance testing for the Federal Communications Commission, and may

not be offered for sale or lease in the United States, or sold or leased until FCC approval has been obtained. For additional information you may e-mail us at: wireless@farinon.harris.com or call **+1 (800) FARINON (within North America), +1 (650) 594-3000 (outside North America)**.

For information on Entrata, please e-mail the company at: sales@entrata.com or call **(203) 264-9536**.

Microwave Communications Division

The Microwave Communications Division is one of four divisions within Harris Communications. The division delivers wireless solutions to service providers of all types, including power utilities; transportation companies; state, local and federal agencies; fixed wireless operators; and public network operators. Its product line, the broadest in the industry, covers frequency bands up to 38 GHz for synchronous and asynchronous applications which comply with international and North American standards. The division is the largest supplier of digital microwave systems in North America and has a customer base in more than 140 countries worldwide.

Communications Sector

Harris' Communications Sector provides one of the most comprehensive communications product lines in the industry, including microwave radio transmission, wireless local loop, analog and digital television and radio broadcast, air traffic communications, secure law enforcement, defense HF/VHF/UHF radio, loop testing, and network management systems, as well as digital network switches, private branch exchanges, telephone craft tool and test sets, and various CTI applications.

Harris Corporation

Harris Corporation, with worldwide sales of \$3.8 billion, is an international communications and electronics company that provides a wide range of products and services such as wireless and personal communications, digital television (HDTV), health care information, multi-media communications, automotive electronics, transportation, business information, defense communications and information, and Lanier office products.

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Aurora™ 2400 Spread Spectrum Digital Microwave Radio

Benefits

- Effortless path alignment and troubleshooting with built-in self diagnostics.
- Higher transmission efficiency through full-duplex frequency operation.
- Higher service protection from weather and frequency interference via software selectable digital coding.
- Higher reliability and cost effectiveness over leased lines.
- Plug-and-play installation with complete radio/antenna package available.
- Rapid delivery.

Features

- Software adjustable transmitter power output to meet regulatory or application requirements.
- High system gain for longer paths and better path reliability.
- Unique spread coding for greater security and interference protection.
- Compact and lightweight design at one RMS for rack/tabletop or base station integration.
- Built-in system control and monitor diagnostics with Aurora™ Software.
- Standard universal AC power or optional widemouth DC power connection.
- Logical LED indicators for set-up and testing.

Choices

- High power option; standard power for Europe/ETSI 300-328 compliance.
- Directional, semi-parabolic antennas with antenna gain and size options.

Applications

- Up to 1 E1/T1 point-to-point wireless communication in the 2.4 GHz ISM band.
- Ideal voice/data interconnection for:
 - Private wireless access.
 - Cellular and PCS/PCN providers.
 - LAN/WAN systems.
 - Internet access providers.
 - State and local government.
 - Mobile and emergency services.

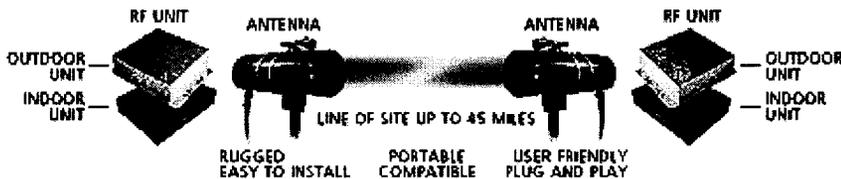
key features system components applications spec sheets

The ioLink 1.5 T1 Wireless System is a full-duplex Direct Sequence Spread Spectrum (DSSS) data device used for communication between two line-of-sight locations. It can be connected to many types of data interfaces in order to meet the communication needs of the user. Since the ioLink 1.5 uses spread spectrum technology, both the transmitted power density and the possibility for interference into neighboring communications systems are greatly reduced.

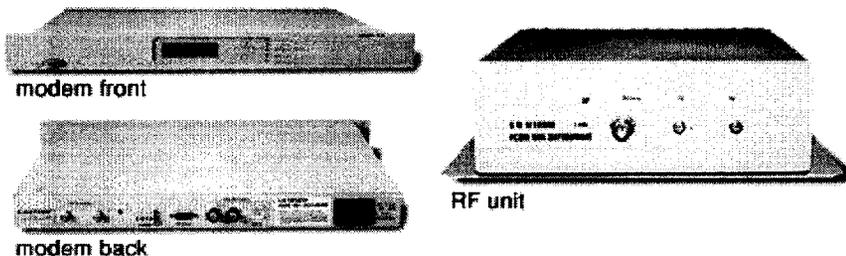
System Components

The ioLink 1.5 consists of three main parts (aside from the user's interface equipment):

1. The indoor modem unit - The modem unit is a 17" W X 1.75" H X 13" D rack-mountable chassis which can either be placed in a standard 19" equipment rack or on a flat surface such as a table or desktop.
2. The RF unit - The RF unit is a 12" H X 12" W X 4.125" D NEMA-4 enclosure that can be mounted directly behind the antenna or at the base of the antenna tower. The best location for the RF unit is directly behind the antenna so that there is little cable loss to degrade the signal.
3. Three types of antennas are commonly used with an ioLink 1.5 system are Yagi, the grid and the parabolic dish. The size of the antenna varies depending on the conditions at the site.



The modem unit is a rack-mountable device that may be co-located with the desired customer premise equipment (CPE). This unit contains the DSX-1 interface, power supply, modulator, and embedded microprocessor. It has LEDs, an LCD, and a keypad for user interface. Because it is SNMP-compliant you can remotely monitor the device for diagnosis, trouble-shooting and measurement of network reliability for quality control.



The RF unit can be located outdoors near the antenna in a weatherproof enclosure. A Siamese coaxial cable connects the two units and provides power to the RF Unit. They may be separated up to 500 feet. A variety of antennas are available to meet your specific requirements.

Communications Link

One communication link consists of one ioLink 1.5 System installed at each end of the line-of-sight link, both of which are capable of transmitting and receiving data signals. Once the link is established between the two units, the user's data is fed through the modem unit where it is multiplied by a pseudo-random noise (PN) code to spread the signal and then sent to the RF unit. The signal is then passed through a series of filters and amplifiers and transmitted via the antenna to the other end of the link where the information goes to the receiving user's device by reversing the process used on the transmit side. The transmission and reception of signals can be done simultaneously at each end of the link, thus allowing full-duplex communication.

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key features**system components****applications****spec sheets****Product Specifications* for ioLink® 1 - 2.4GHz**

Electrical

Transmitter

Output Power	+7 dBm to + 15 dBm (adjustable at the factory)
Frequency Range	2400 to 2483.5 MHz
Channel Bandwidth	22 MHz
IF Frequency	110 MHz
Frequency Selection	2412 MHz and 2452MHz (Plan A)
Modulation	DQPSK
Spreading Method	Direct Sequence
Code Length	10/T1, 11/E1
Number of Stored Codes	4
Clock Source	Internal

Receiver

Receive Level	-30 dBm (no error) to -90 dBm (1E-6 BER)
Max Receive Level (no damage)	0 dBm
Receive Sensitivity at 1E-6 BER)	-90 dBm
IF Frequency	70 MHz
Processing Gain	>10dB

RF Unit: Connector Types

To Antenna	Type N Female
To Modem	Type F Female (2x) or TNC Female (2x)
Line Build-Out	0-500 ft.

Modem Unit: Data Interface

Interfaces	DSX-1 (T1), G.703 (E1)
Data Rates	1544 (T1), 2048 (E1) kbps
Line Codes	AMI, B8ZS (T1), HDB3 (E1)
Line Build-Out	0-655 ft.

Diagnostics

Front Panel	LEDs, Keypad, LCD
Monitor/Control	Local via keypad, Remote via RS232, SNMP-compliant agent

Modem Unit: Connectors

User Data

DSX-1	RJ-48C, Female (100 ohms)
ITU G.703	BNC, (2x) Female (75 ohms) or (120 ohms)

Monitor and Control

Remote DE-9, Male (RS232)
Local Form-C Relay

RF Unit Interface F, Female (2x)

Modem Unit: Power

AC Connector EIA 3 prong, Male
Voltage Universal 90-260 VAC, 50/60 Hz
DC Connector Terminal Block 16 AWG
Voltage 36-72 UDC
Power Consumption 27 watts maximum, Internal 1.5A "slow blow" fuse

Environmental:	Modem	RF
Operational Temperature	0°C to +55°C	-30°C to +55°C
Storage	-40°C to +70°C	-40°C to +70°C
Humidity	0-95% Non-Condensing	0-95% Non-Immersion Rain (4 in/hr)

Mechanical:	Modem	RF
Width	16.8"	12"
Height	1.75"	12" (14" baseplate)
Depth	12.6"	4.125"
Weight	6 lb. (2.7 kg)	11 lb. (5 kg)

*product specifications may change without notice

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CERTIFICATE OF SERVICE

I, Tammy M. Sendelback, hereby certify that the foregoing Petition for Reconsideration was served this 28th day of December, 1998, by depositing a true copy thereof with the United States Postal Service, first-class postage prepaid, addressed to the parties listed on the attached list unless otherwise noted:



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