

# FOCUS

Investment Banking

Telecom Technology and Services Group

## Carrier-Focused Telecom Technology Quarterly



### Investment Banking and Advisory Services

FOCUS Investment Banking LLC is a leading investment bank with specialized telecom technology and services expertise, concentrating on providing highly tailored services to emerging middle market and larger organizations in this sector:

- Mergers & Acquisition Advisory
- Corporate Development Consulting
- Strategic Partnering & Alliances
- Capital Financing, Debt & Equity
- Corporate Valuations

### Winter 2022

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# Carrier-Focused Telecom Technology Quarterly

By Richard Pierce, FOCUS Managing Director and Telecom Technology and Services Team Leader

FOCUS believes that the Carrier-Focused Telecom Technology sector is one of the most important in Telecom. As communications service providers struggle to keep up with ever increasing demand from their data hungry customers, they are turning to their technology partners to help them satisfy these needs in a cost-effective way. In addition to simply increasing the capacity of both wireline and wireless networks, companies in the Carrier-Focused Telecom Technology sector are also helping customers perform a variety of other critical functions including network planning and optimization, network monitoring, service assurance, network testing and service delivery and monetization. While some of the largest technology companies in the world are helping to meet many of these challenges, we believe there is significant innovation among middle market technology providers and ample opportunities for them to create meaningful value for their shareholders. FOCUS is proud of its commitment to the Carrier-Focused Telecom Technology sector and we are excited about the prospects for middle market companies in this space.

The FOCUS Telecom Technology and Services group consists of professionals with substantial expertise in both Telecom and investment banking. The FOCUS Telecom team is uniquely qualified to help middle market clients reach their strategic objectives because the group:

- Devotes significant senior level resources to executing transactions for lower middle market clients,
- Has a breadth of knowledge that covers most segments of the telecom industry,
- Has a proven transaction methodology for delivering results,
- Is equally comfortable with buy side and sell side M&A,
- Leverages an experienced team of research professionals,
- Has a national presence with coverage of both East and West coasts.

## Sub Sector Definitions

**Large Cap:** Large, diversified companies with products across a variety of sub sectors

**OSS/BSS Software:** Software systems that manage and bill the customer base and monitor and maintain telecom networks

**IP Networking:** Carrier Ethernet switching, routers and IP Multimedia Subsystem ("IMS") components

**Wireline Access and Transport:** DSL equipment, PON equipment and WDM-based transport

**Cable and Video:** Products such as headends and servers that support video delivery as well as broadband products for cable networks

**Broadband Wireless:** High capacity, fixed wireless equipment

**Test and Measurement:** Equipment used by both service providers and manufacturers to test and monitor networks and equipment

# Summary Comments

## Public Markets

The FOCUS Carrier-Focused Telecom Technology Index (CFTTI) gained 4.8% in the past three months. This comfortably exceeded both the 3.2% gain in the S&P 500 and the 3.0% decline in the NASDAQ. Even with this period's gain, the CFTTI is still down 11.9% year-over-year. This performance was slightly worse than the 10.7% decline in the S&P 500 over this same time period, but much better than the 26.2% loss in the NASDAQ. Sector multiples are lower than they were a year ago, but not by a wide margin. The CFTTI revenue multiple dipped from 2.5x to 2.3x, while the EBITDA multiple fell from 12.0x to 11.4x.

## Large Cap

This period's 6.0% gain in the Large Cap sub sector made it the second best performing sub sector in the CFTTI over these past three months. Cisco and Juniper were the two companies that powered the sub sector's gains as they posted increases of 11.2% and 17.0%, respectively. The news was not as good for the rest of the sub sector, as the remaining three companies all traded lower. The sub sector remains solidly in negative territory for the full year period with a loss of 13.5%. Sub sector multiples fell from 2.5x revenue and 11.4x EBITDA a year ago to current levels of 2.2x revenue and 10.4x EBITDA.

## OSS/BSS Software

The OSS/BSS Software sub sector was another sub sector that posted a solid gain in our winter reporting period as it increased 5.2% in the past three months. Gainers and losers were split evenly at four apiece, but strong gains at the larger market cap companies like NetScout and Amdocs overcame double digit losses at Optiva, Radcom, Subex and Synchronoss. The sub sector is also up nearly 19% compared to last year, which makes it the best performing sub sector in the CFTTI over this time frame. Sub sector multiples closed out the period at 2.4x revenue and 11.8x EBITDA. Both of these represent increases over year-ago levels of 2.2x revenue and 10.6x EBITDA..

## IP Networking

After turning in a positive performance in our fall reporting period, the IP Networking sub sector abruptly reversed course and dropped 19.9% in the winter reporting period. This made it the worst performing sub sector in the CFTTI over the past three months. Losses were broad-based as all three companies in the index suffered double digit declines. The situation is not any better for the full year period as the sub sector has shed more than half of its value in the last twelve months. Once again, this puts it at the bottom of the CFTTI in terms of year-over-year performance. The sub sector revenue multiple dropped precipitously compared to this time last year, falling from 2.0x to 1.1x. However, the sub sector EBITDA multiple actually increased from 11.5x to 13.9x

## Wireline Access and Transport

While it was by no means a spectacular period for the Wireline Access and Transport sub sector, it still managed to deliver a solid three-month return of 2.3%. The big winners were ADVA, Calix and Infinera, all three of which delivered returns north of 15%. On the other hand, companies like ADTRAN, CIENA and Dasan Zhone Solutions served as an anchor on sub sector performance as all three companies suffered double digit declines. For the full year, the sub sector remains steeply in the red with a loss of 12.2%. ADVA and Tejas Networks are the top performing companies over this time period, while BATM, CIENA and Infinera all had steep losses. Multiple performance was mixed compared to this time last year. The sub sector revenue multiple declined from 2.6x to 2.2x, but the EBITDA multiple increased from 18.7x to 25.8x.

## Cable and Video

The Cable and Video sub sector was the best performing sub sector in the CFTTI this period with a three-month gain of 16.3%. However, the sub sector's gains were by no means broad-based. In fact, this was the second period in a row that Harmonic was the only company in the index to trade in positive territory. We see a similar picture for the full year, where the sub sector's 10.1% annual gain is entirely due to a 42.7% increase at Harmonic. Sub sector multiples are higher than they were a year ago. The revenue multiple increased from 1.9x to 2.1x, while the EBITDA multiple jumped from 21.9x all the way up to 54.8x.

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## Broadband Wireless

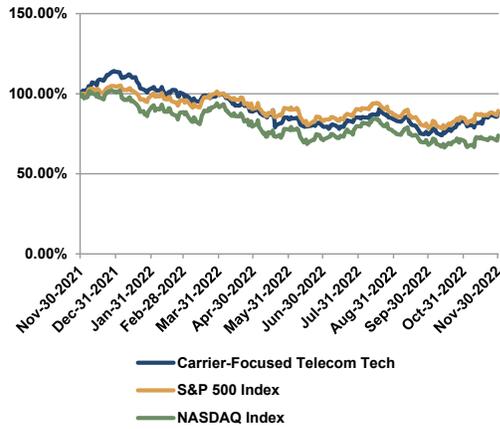
After being the CFTTI's top performing sub sector in our fall report, the Broadband Wireless sub sector reversed course and fell 3.1% in the current three month period. Three of the five companies in the index were in negative territory for the period, and both Airspan Networks and Ceragon Networks suffered double digit losses. The sub sector is also trading lower than it was a year ago, although at a 2.0% decline the loss is relatively modest. Sub sector multiples closed out the period at 7.2x revenue (up from 6.9x a year ago) and 43.7x EBITDA (up from 25.2x a year ago).

## Test and Measurement

The Test and Measurement sub sector suffered a decline of 9.0% this period. An 11.7% gain at Spirent was more than counterbalanced by steep losses at both Anritsu and Viavi. The sub sector is also down 20.9% compared to this time last year, with all three companies in the index in negative territory. Sub sector multiples declined from 2.6x revenue and 12.2x EBITDA a year ago to 2.2x revenue and 10.5x EBITDA currently.

# Carrier-Focused Telecom Technology: Public Market Summary

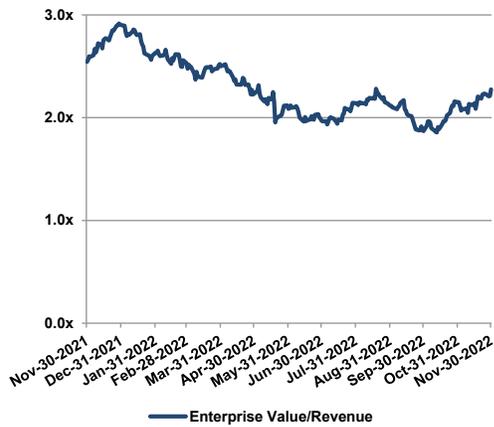
## Twelve Month Index Returns



## Sector and Sub Sector Returns

	12 Month	3 Month
Carrier-Focused Telecom Tech	-11.9%	4.8%
Large Cap	-13.5%	6.0%
OSS/BSS	18.9%	5.2%
IP Networking	-51.8%	-19.9%
Wireline Access and Transport	-12.2%	2.3%
Cable and Video	10.1%	16.3%
Broadband Wireless	-2.0%	-3.1%
Test and Measurement	-20.9%	-9.0%
S&P 500	-10.7%	3.2%
NASDAQ	-26.2%	-3.0%

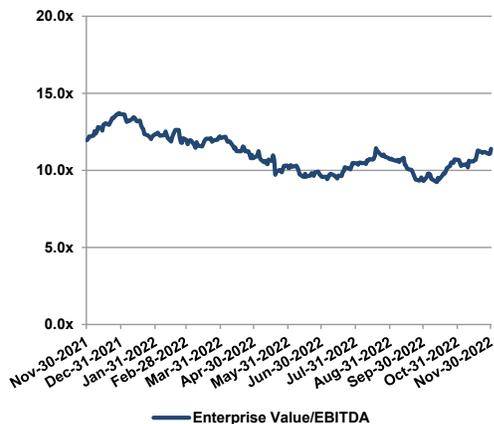
## Revenue Multiple Trends



## Sector and Sub Sector Revenue Multiples

	11/30/2022	11/30/2021
Carrier-Focused Telecom Tech	2.3x	2.5x
Large Cap	2.2x	2.5x
OSS/BSS	2.4x	2.2x
IP Networking	1.1x	2.0x
Wireline Access and Transport	2.2x	2.6x
Cable and Video	2.1x	1.9x
Broadband Wireless	7.2x	6.9x
Test and Measurement	2.2x	2.6x

## EBITDA Multiple Trends



## Sector and Sub Sector EBITDA Multiples

	11/30/2022	11/30/2021
Carrier-Focused Telecom Tech	11.4x	12.0x
Large Cap	10.4x	11.4x
OSS/BSS	11.8x	10.6x
IP Networking	13.9x	11.5x
Wireline Access and Transport	25.8x	18.7x
Cable and Video	54.8x	21.9x
Broadband Wireless	43.7x	25.2x
Test and Measurement	10.5x	12.2x

Source: Capital IQ

# M&A Summary Comments

## M&A

With only six transactions in the past three months, M&A activity in the Carrier-Focused Telecom Technology sector was at its lowest ebb in recent memory in terms of the total number of deals. Total announced transaction dollar volume was slightly better for the period at \$210 million, but this was still not a particularly robust figure. With only one month left in the year, it certainly appears that the sector will be at or near its lowest levels of M&A activity for the last five years both in terms of the number of transactions and the total announced dollar volume of transactions.

## OSS/BSS Software

Much of the decline in sector M&A activity can be traced directly to the OSS/BSS Software sub sector, which had only two transactions for the period. This significantly trails historical norms. Constellation Software was once again an active acquirer as its Harris Computer subsidiary acquired telecom billing company Mid America Computer Corporation. In addition, Orbia acquired Biarri Networks, a company that provides software for designing fiber optic networks.

## IP Networking

In the IP Networking sub sector, CIENA acquired Benu Networks. Benu Networks provides network gateway and edge router products.

## Wireline Access and Transport

CIENA was also the lone acquirer in the Wireline Access and Transport sub sector with its pickup of Tibit Communications for \$210 million. Tibit provides technology for integrating PON technology with a carrier-grade Ethernet switch.

## Cable and Video

Technetix inked its first acquisition in nearly two years with its purchase of Lindsay Broadband, a provider of RF, optical, powering and business connectivity solutions.

## Broadband Wireless

Curvalux acquired point-to-multipoint microwave broadband equipment vendor Cambridge Broadband.

## Test and Measurement

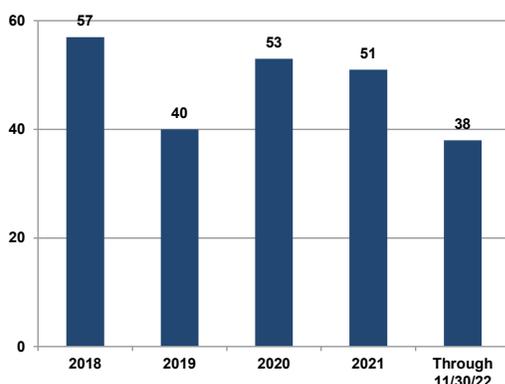
There were no transactions in the Test and Measurement sub sector this period.

## Transactions with Multiples

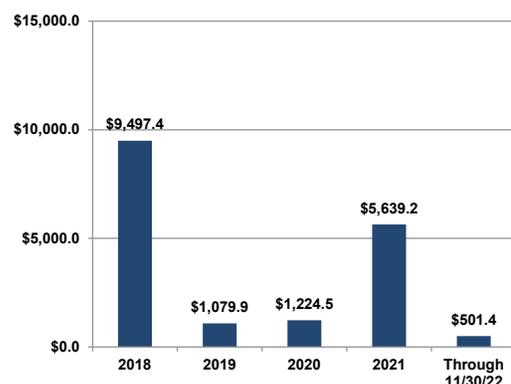
There were no transactions with announced multiples this period.

## Carrier-Focused Telecom Technology: M&A Summary

M&A Activity: Number of Transactions



M&A Activity (\$ Value of Transactions in Millions)



## M&A Announced Transactions (9/1/21 – 11/30/22)

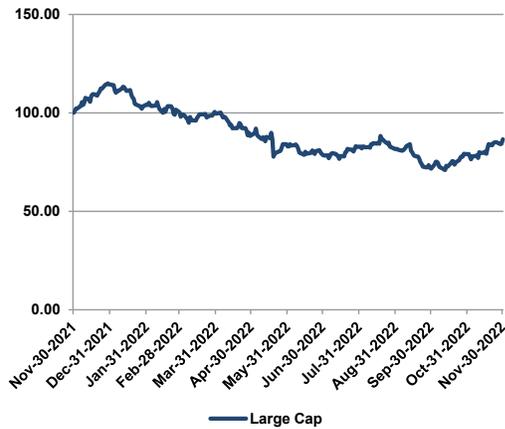
Acquiror	Target	Sector	Date Announced	Purchase Price	Description
CIENA	Benu Networks	IP Networking	11/22/22	NA	Cloud-native broadband network gateway and edge router products.
CIENA	Tibit Communications	Wireline Access and Transport	11/22/22	\$210.0	Open, microplug OLT technology that integrates PON technology with a carrier-grade Ethernet switch.
Constellation Software	Mid America Computer Corporation	OSS/BSS Software	10/21/22	NA	Billing, accounting and carrier access billing systems for telecom operators.
Orbia	Biarri Networks	OSS/BSS Software	10/4/22	NA	Fiber optic network design and deployment software firm.
Curvalux	Cambridge Broadband	Broadband Wireless	10/3/22	NA	Point-to-multipoint microwave broadband equipment for telecom operators, WISPs and municipalities.
Technetix	Lindsay Broadband	Cable and Video	9/6/22	NA	End-to-end solutions for RF, optical, powering and business connectivity.

## M&A Announced Transactions with Revenue Multiples (12/1/21 – 11/30/22)

Acquiror	Target	Sector	Date Announced	Purchase Price	Revenue Multiple	EBITDA Multiple	Description
IQGeo	COMSOF	OSS/BSS Software	8/11/22	\$13.4	1.8 x	9.8 x	GIS-based network planning and design SaaS with features for fiber optic, heat and smart grid network designing and planning.
Cyient	Celfinet	OSS/BSS Software	6/6/22	\$28.6	1.5 x	NA	5G network planning, performance optimization and management SaaS and network engineering and consulting services.
DASAN Zhong Solutions	ASSIA	OSS/BSS Software	5/2/22	\$25.0	1.5 x	NA	Broadband access quality-of-experience solutions for telecom operators.
Jiangsu Etern Company	Beijing Etern Zhiyuan Network Technology	OSS/BSS Software	4/26/22	\$28.0	2.9 x	NA	Software for mobile operators for signaling collection analysis, operation support, security analysis and user behavior analysis.
Aviat Networks	Redline Communications	Broadband Wireless	4/13/22	\$8.4	0.4 x	NM	Provides wireless base station infrastructure and networking systems to enable voice, data, M2M and video communications.

# Sub Sector Analysis: Large Cap

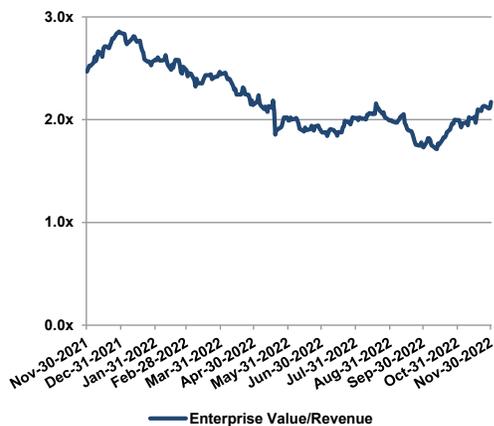
## Twelve Month Index Returns



## Company Returns

	12 Month	3 Month
Large Cap Index	-13.5%	6.0%
Cisco	-9.3%	11.2%
Ericsson	-36.3%	-14.3%
Juniper	6.8%	17.0%
Nokia	-13.4%	-4.9%
ZTE	-28.2%	-2.7%

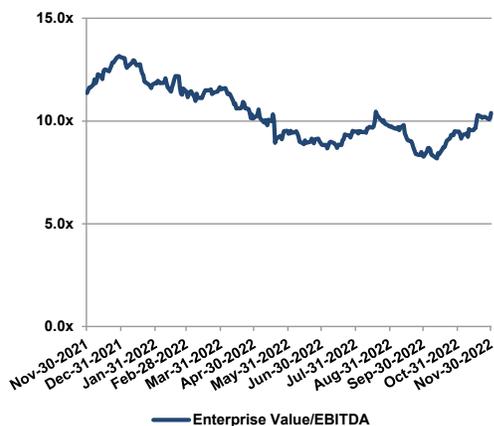
## Revenue Multiple Trends



## Company Revenue Multiples

	11/30/2022	11/30/2021
Large Cap Index	2.2x	2.5x
Cisco	3.7x	4.3x
Ericsson	0.9x	1.2x
Juniper	2.2x	2.3x
Nokia	1.0x	1.1x
ZTE	0.8x	1.2x

## EBITDA Multiple Trends



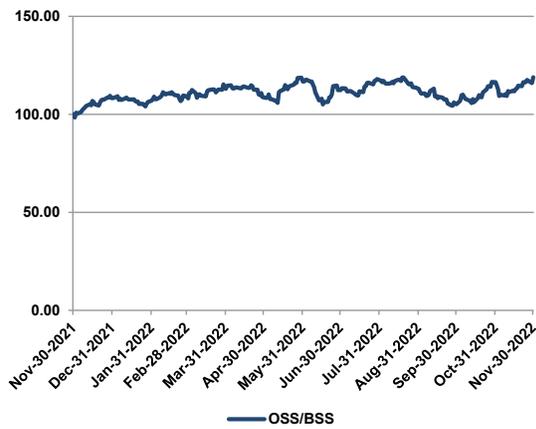
## Company EBITDA Multiples

	11/30/2022	11/30/2021
Large Cap Index	10.4x	11.4x
Cisco	12.3x	13.8x
Ericsson	5.9x	7.6x
Juniper	15.9x	15.5x
Nokia	7.8x	7.2x
ZTE	11.5x	14.3x

Source: Capital IQ

# Sub Sector Analysis: OSS/BSS Software

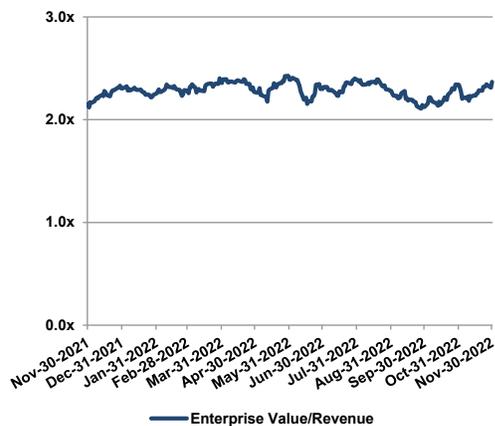
## Twelve Month Index Returns



## Company Returns

	12 Month	3 Month
OSS/BSS Index	18.9%	5.2%
Amdocs	27.3%	4.0%
CSG Systems	17.3%	6.9%
NetScout	24.7%	17.5%
Optiva	-17.4%	-24.9%
Radcom	-7.1%	-13.9%
Subex	-41.5%	-16.4%
Synchronoss	-65.6%	-42.6%
Tecnotree	-59.1%	7.8%

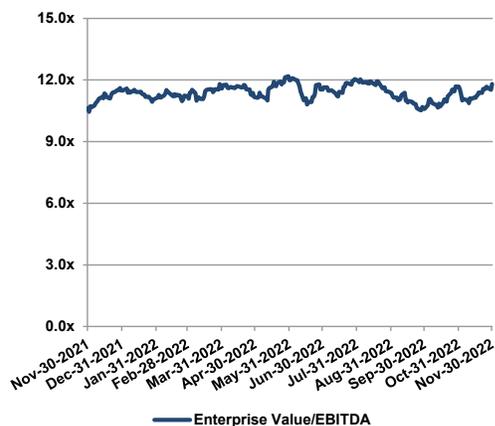
## Revenue Multiple Trends



## Company Revenue Multiples

	11/30/2022	11/30/2021
OSS/BSS Index	2.4x	2.2x
Amdocs	2.4x	2.1x
CSG Systems	2.1x	1.9x
NetScout Systems	2.9x	2.5x
Optiva	2.4x	2.2x
Radcom	1.9x	2.4x
Subex	5.3x	7.2x
Synchronoss	1.2x	1.7x
Tecnotree	2.5x	6.3x

## EBITDA Multiple Trends



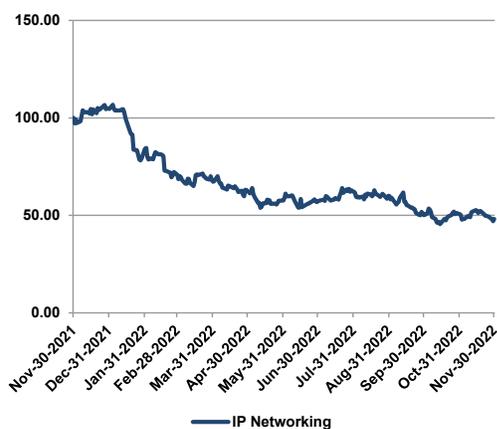
## Company EBITDA Multiples

	11/30/2022	11/30/2021
OSS/BSS Index	11.8x	10.6x
Amdocs	12.3x	10.9x
CSG Systems	14.2x	11.3x
NetScout Systems	16.9x	14.1x
Optiva	11.6x	7.9x
Radcom	NM	NM
Subex	425.8x	36.8x
Synchronoss	9.8x	123.5x
Tecnotree	9.5x	17.3x

Source: Capital IQ

# Sub Sector Analysis: IP Networking

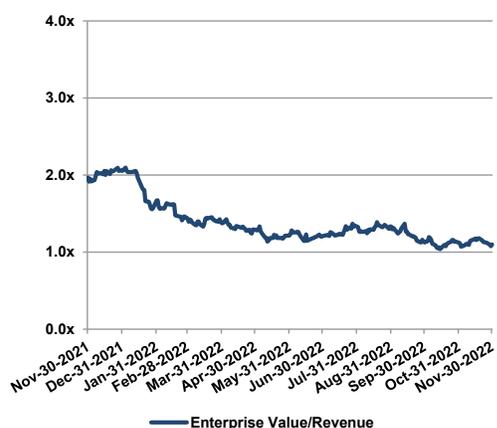
## Twelve Month Index Returns



## Company Returns

	12 Month	3 Month
IP Networking Index	-51.8%	-19.9%
Allot Communications	-67.7%	-18.3%
Audiocodes	-44.6%	-13.7%
Ribbon Communications	-53.6%	-27.9%

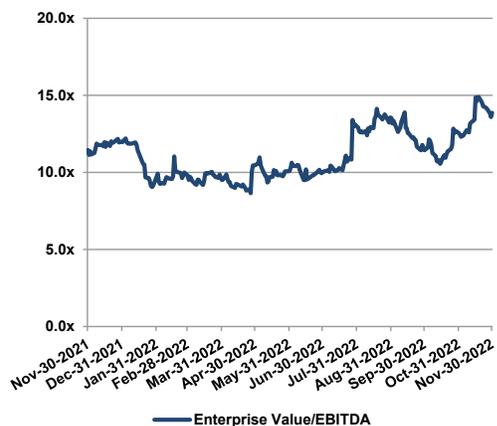
## Revenue Multiple Trends



## Company Revenue Multiples

	11/30/2022	11/30/2021
IP Networking Index	1.1x	2.0x
Allot Communications	0.7x	2.2x
Audiocodes	1.8x	4.0x
Ribbon Communications	0.9x	1.4x

## EBITDA Multiple Trends



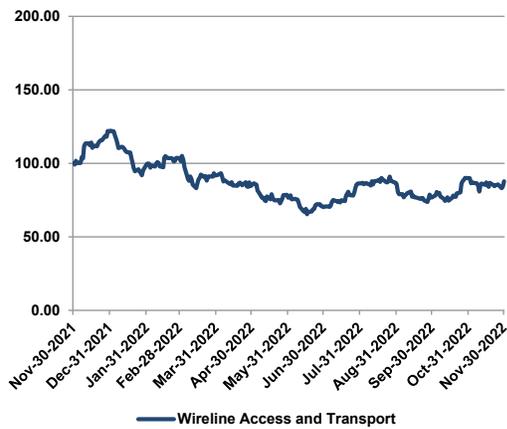
## Company EBITDA Multiples

	11/30/2022	11/30/2021
IP Networking Index	13.9x	11.5x
Allot Communications	NM	NM
Audiocodes	14.1x	21.5x
Ribbon Communications	17.6x	9.1x

Source: Capital IQ

# Sub Sector Analysis: Wireline Access and Transport

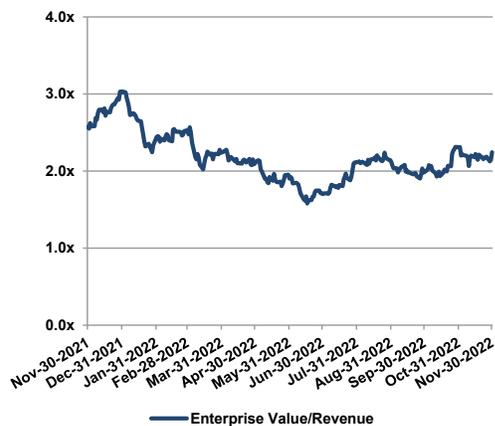
## Twelve Month Index Returns



## Company Returns

	12 Month	3 Month
Wireline Access & Transport Index	-12.2%	2.3%
ADTRAN	-0.5%	-12.8%
ADVA	50.6%	16.2%
BATM	-69.8%	-5.6%
Calix	6.5%	21.2%
CIENA	-25.4%	-11.4%
Dasan Zhone Solutions	-8.8%	-11.2%
Infinera	-17.0%	23.2%
Tejas Networks	35.2%	4.1%

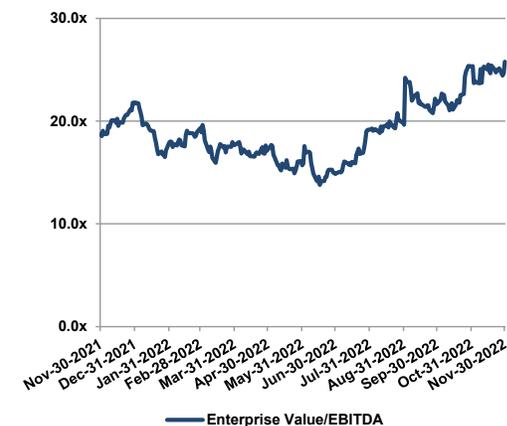
## Revenue Multiple Trends



## Company Revenue Multiples

	11/30/2022	11/30/2021
Wireline Access & Transport Index	2.2x	2.6x
ADTRAN	2.3x	1.7x
ADVA	1.7x	1.0x
BATM	0.8x	2.6x
Calix	5.6x	6.1x
CIENA	1.8x	2.4x
DASAN Zhone Solutions	1.1x	1.0x
Infinera	1.4x	1.5x
Tejas Networks	15.9x	5.9x

## EBITDA Multiple Trends



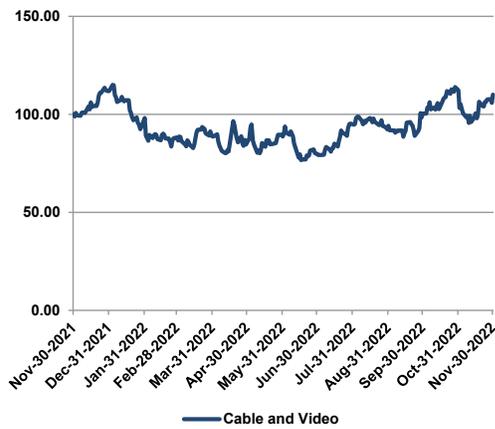
## Company EBITDA Multiples

	11/30/2022	11/30/2021
Wireline Access & Transport Index	25.8x	18.7x
ADTRAN	175.5x	52.2x
ADVA	29.9x	9.0x
BATM	NM	17.3x
Calix	65.5x	41.4x
CIENA	16.5x	14.1x
DASAN Zhone Solutions	NM	NM
Infinera	387.4x	125.8x
Tejas Networks	NM	86.6x

Source: Capital IQ

# Sub Sector Analysis: Cable and Video

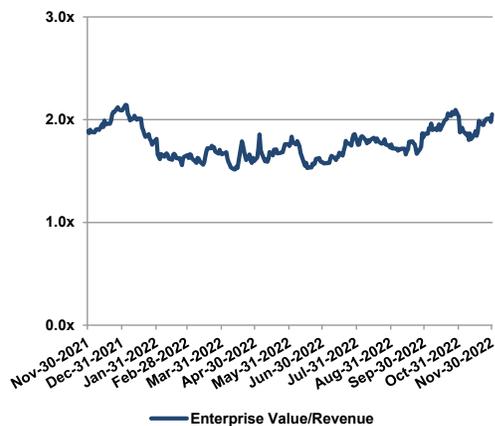
## Twelve Month Index Returns



## Company Returns

	12 Month	3 Month
Cable and Video Index	10.1%	16.3%
Aferian	-48.6%	-30.1%
Casa Systems	-45.1%	-29.4%
Harmonic	42.7%	36.2%
SeaChange	-39.1%	-11.7%

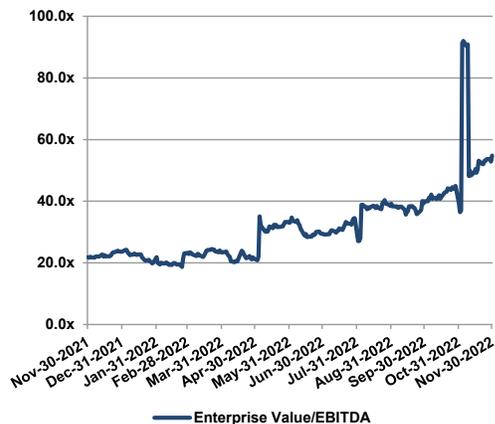
## Revenue Multiple Trends



## Company Revenue Multiples

	11/30/2022	11/30/2021
Cable and Video Index	2.1x	1.9x
Aferian	0.9x	1.9x
Casa Systems	1.1x	1.3x
Harmonic	2.8x	2.4x
SeaChange	0.3x	0.8x

## EBITDA Multiple Trends



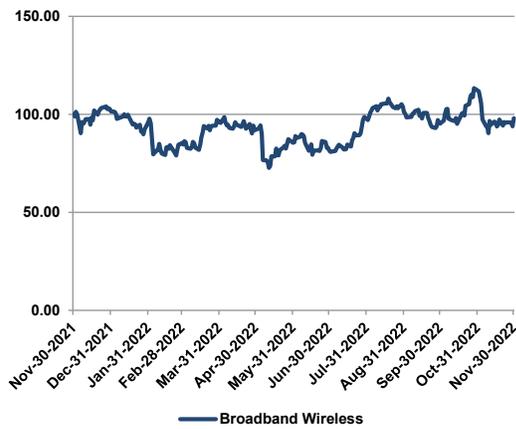
## Company EBITDA Multiples

	11/30/2022	11/30/2021
Cable and Video Index	54.8x	21.9x
Aferian	12.4x	18.2x
Casa Systems	NM	12.9x
Harmonic	28.9x	32.2x
SeaChange	NM	NM

Source: Capital IQ

# Sub Sector Analysis: Broadband Wireless

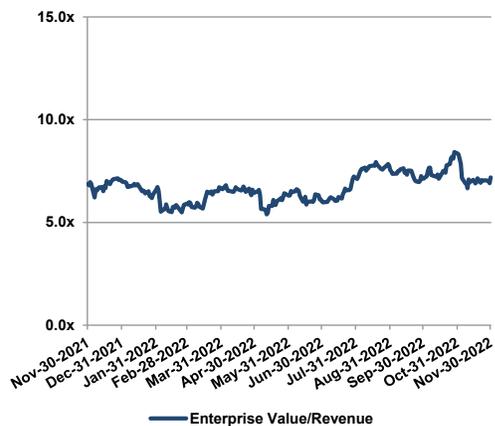
## Twelve Month Index Returns



## Company Returns

	12 Month	3 Month
Broadband Wireless Index	-2.0%	-3.1%
Airspan Networks	-65.1%	-13.2%
Aviat Networks	0.4%	0.5%
Cambium Networks	-21.8%	9.4%
Ceragon Networks	-25.5%	-11.3%
Ubiquiti Networks	0.2%	-3.3%

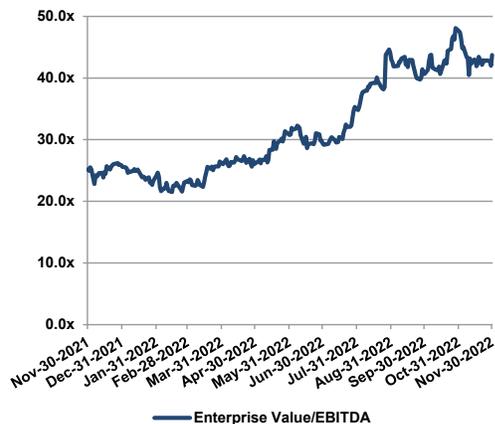
## Revenue Multiple Trends



## Company Revenue Multiples

	11/30/2022	11/30/2021
Broadband Wireless Index	7.2x	6.9x
Airspan Networks	1.4x	2.0x
Aviat Networks	1.1x	1.1x
Cambium Networks	1.9x	2.1x
Ceragon Networks	0.6x	0.8x
Ubiquiti Networks	10.9x	10.1x

## EBITDA Multiple Trends



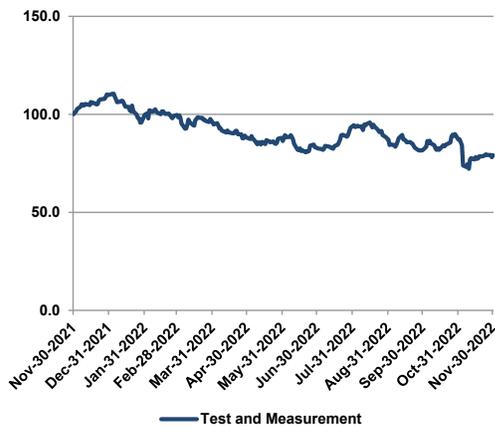
## Company EBITDA Multiples

	11/30/2022	11/30/2021
Broadband Wireless Index	43.7x	25.2x
Airspan Networks	NM	NM
Aviat Networks	10.5x	10.0x
Cambium Networks	30.1x	13.8x
Ceragon Networks	11.7x	14.9x
Ubiquiti Networks	43.2x	26.1x

Source: Capital IQ

# Sub Sector Analysis: Test and Measurement

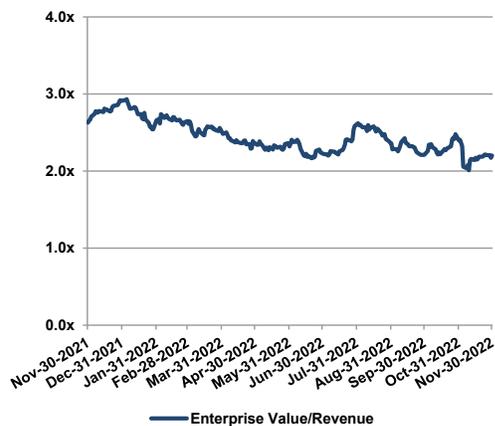
## Twelve Month Index Returns



## Company Returns

	12 Month	3 Month
Test and Measurement Index	-20.9%	-9.0%
Anritsu	-32.4%	-11.6%
Spirent	-5.4%	11.7%
Viavi	-23.5%	-19.5%

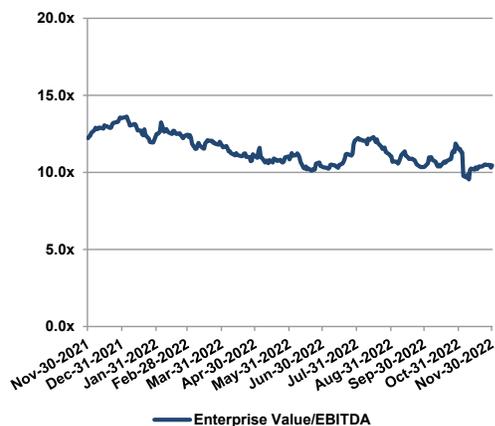
## Revenue Multiple Trends



## Company Revenue Multiples

	11/30/2022	11/30/2021
Test and Measurement Index	2.2x	2.6x
Anritsu	1.5x	1.8x
Spirent	3.1x	3.6x
Viavi	2.2x	2.8x

## EBITDA Multiple Trends



## Company EBITDA Multiples

	11/30/2022	11/30/2021
Test and Measurement Index	10.5x	12.2x
Anritsu	7.9x	8.4x
Spirent	14.6x	16.7x
Viavi	10.7x	14.0x

Source: Capital IQ

# FOCUS Telecom Technology and Services Team

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## **Richard H. Pierce**

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Rich Pierce has 20 years of investment banking experience advising middle market clients on a variety of mergers and acquisitions and capital raising transactions. During that time, Mr. Pierce's primary emphasis has been on serving clients in the telecommunications industry including providers of network related hardware and software products, wireless and wireline telecommunications service providers and network engineering and construction companies.



## **David Freeland**

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David Freeland, a FOCUS Managing Director, has more than fifteen years of experience providing investment banking and management consulting services to a variety of corporate clients, ranging from the Fortune 500 to start-up businesses. He has been an investment banker since 2003, advising clients on mergers and acquisitions and capital raising transactions. Mr. Freeland has broad experience in the telecom and technology industry and has significant experience with data center companies.

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With more than three decades of experience, FOCUS Investment Banking is a trusted name in M&A advisory services worldwide. FOCUS works to understand each client's strategic and financial objectives, craft the best plan to achieve these goals, and deliver success. Whether helping to sell, buy, or raise capital, FOCUS strives to maximize the value of every transaction to the benefit of its clients. FOCUS bankers are seasoned operating and financial executives with extensive transaction experience. Securities transactions conducted by FOCUS Securities LLC, an affiliated company, registered Broker Dealer member FINRA/SIPC. For more information on FOCUS, please visit [www.focusbankers.com](http://www.focusbankers.com).

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