

Trinity-50 TDD Product Series—Time Division Duplex

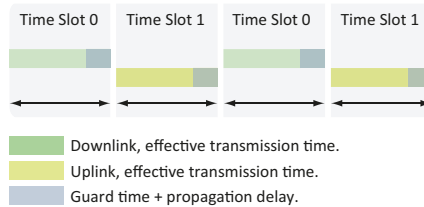
Provides robust and long range links to demanding networks

Operating in the 5 GHz unlicensed band at a data rate up to 40 Mbps aggregated throughput, the Trinity-50TDD Series are designed to reliably transport your data, voice and video communications in virtually any environment – high-interference and long-range line-of-sight paths, over water and open terrain, even in extreme weather conditions. The True TDD technology greatly enhances link performance in a wide variety of applications, including:

- Building-to-building and campus connectivity
- High-speed wireless backhaul
- Single-hop, long-range line-of-sight links
- Extending video surveillance beyond the constraints of a wired network

TDD based software

Trinity TDD uses TDD technology to emulate full duplex links over a half duplex communication link. The TDD link operates symmetrically*, optimizing the link for low latency. TDD technology greatly reduces the impact of long distances compared with other technologies.



By using this type of true TDD and not a system based on a start and stop frame we enhance and strengthen the link against interference.

Advanced retransmission

In all unlicensed bands where interference-free spectrum is rare there is a need for retransmissions. The Trinity TDD software implements a proprietary retransmission algorithm that immediately retransmits lost radio frames. The retransmission is performed at the link layer and reacts before any higher layers has noticed the initial lost frame. The proprietary retransmission algorithm ensures low latency, high reliability and that frames are delivered in correct order.

Channel Bandwidth

Trinity TDD enables the user to choose the channel bandwidth of, 5, 10 or 20MHz. This reduces the spectrum footprint and increases the reliability in the unlicensed band where interference-free spectrum is rare.

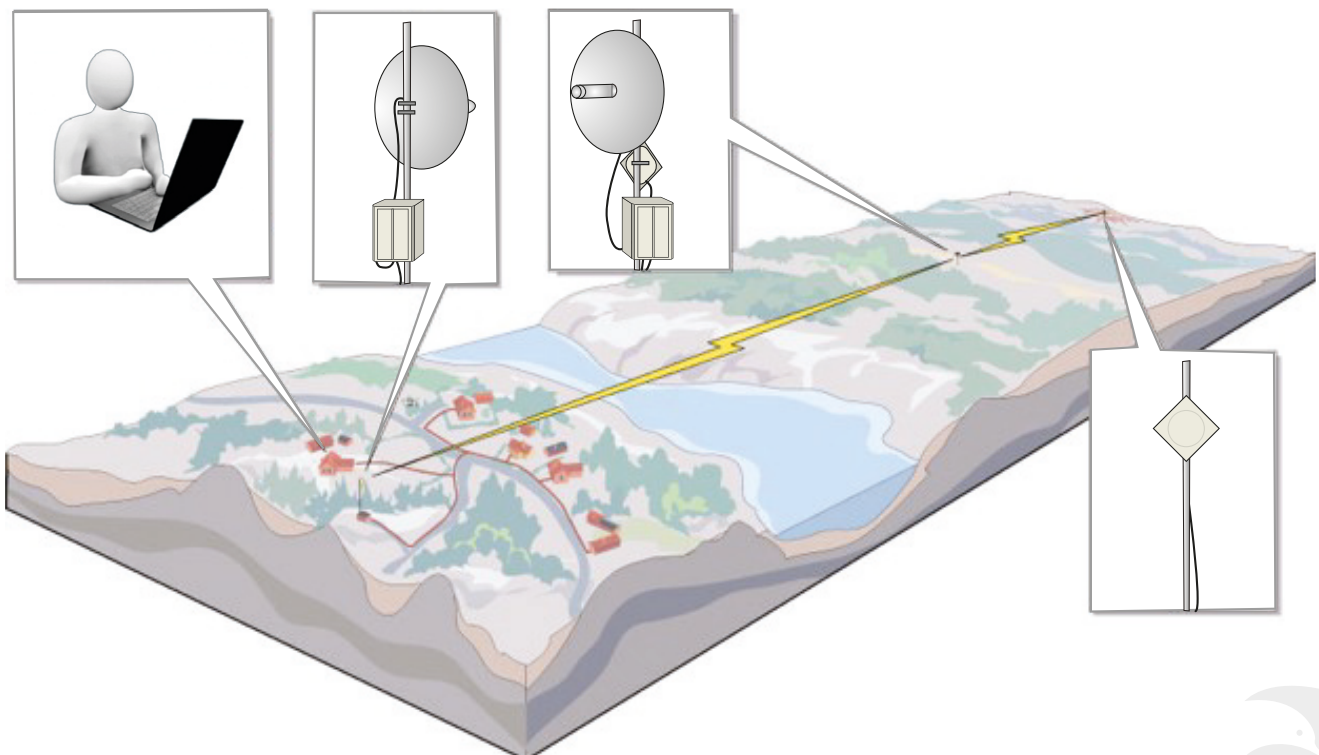
Easy setup

The signal strength is presented to the installer both visual and with audio signal. This enables the installer to easy align the antennas to achieve the best performance of the link.

Product Highlights

- 40 Mbps aggregated throughput
- Operational range more than 50 km**
- Supporting a variety of channel widths: 5, 10 and 20 MHz
- 5 GHz frequency range
- Local and remote network management
- Advanced spectrum analyzer
- QoS: Four traffic classes prioritize traffic

* Future software upgrade will enable asymmetric TDD.
** Depends on antenna gain and the grade of LoS.



	Trinity-50TDD/23	Trinity-50TDD/28	Trinity-50TDD/N
Radio			
Frequency Bands	5.150 – 5.845 GHz	5.150 – 5.845 GHz	5.150 – 5.845 GHz
Channel widths supported	20/10/5 MHz	20/10/5 MHz	20/10/5 MHz
Capacity	40 Mbps aggregated throughput	40 Mbps aggregated throughput	40 Mbps aggregated throughput
Duplex Technique	TDD	TDD	TDD
Modulation	OFDM	OFDM	OFDM
	PSK/QPSK/16QAM/64QAM	PSK/QPSK/16QAM/64QAM	PSK/QPSK/16QAM/64QAM
Max Tx Power	25 dBm	25 dBm	25 dBm
Max Rx sensitivity	-93 dBm	-93 dBm	-93 dBm
Error Correction	FEC; k=1/2,2/3,3/4	FEC; k=1/2,2/3,3/4	FEC; k=1/2,2/3,3/4
Encryption	128 bit	128 bit	128 bit
Surge Protection	14kV	14kV	14kV
Antenna Protection	Internal DC Grounding	Internal DC Grounding	Internal DC Grounding
DFS	Yes	Yes	Yes
Antenna			
Gain	Internal typ. 23dBi	External typ. 28dBi	External
VSWR	max. 1.5:1	< 1.7:1	
3 dB Beam-Width, H-Plane	typ. 10.5°	typ. 7°	
3 dB Beam-Width, V-Plane	typ. 10.5°	typ. 7°	
Polarization	Linear or Vertical	Linear or Vertical	
Connector	N/A	N female	N female
Antenna Cable	N/A	1.5m with N male Connector	
Ethernet Interface			
Type	10/100BaseT Interface with Auto-negotiation (IEEE 802.3)	10/100BaseT Interface with Auto-negotiation (IEEE 802.3)	10/100BaseT Interface with Auto-negotiation (IEEE 802.3)
Number of Ethernet Ports	1	1	1
Framing/Coding	IEEE 802.3u	IEEE 802.3u	IEEE 802.3u
Traffic Handling	MAC layer bridging, self learning, 802.1q transparent	MAC layer bridging, self-learning 802.1q transparent	MAC layer bridging, self-learning 802.1q transparent
Data Latency	3,5 msec (typical)	3,5 msec (typical)	3,5 msec (typical)
Packets/second	20000	20000	20000
VLAN ID for Management	Supported	Supported	Supported
QoS	Four Access Categories (AC) Voice, Video, Best Effort, and Background	Four Access Categories (AC) Voice, Video, Best Effort, and Background	Four Access Categories (AC) Voice, Video, Best Effort, and Background
Power over Ethernet	Traffic classification according to WMM	Traffic classification according to WMM	Traffic classification according to WMM
Connector	12 - 48V DC (<10W) RJ-45	12 - 48V DC (<10W) RJ-45	12 - 48V DC (<10W) RJ-45
Management			
Link Management	Web interface	Web interface	Web interface
Protocol	SNMP	SNMP	SNMP
NMS Application	RCS (Repeatit NMS)	RCS (Repeatit NMS)	RCS (Repeatit NMS)
Tools in web interface	Spectrum Analyser Speed Test	Spectrum Analyser Speed Test	Spectrum Analyser Speed Test
Environment			
IP Code	IP67	IP67	IP67
Temperature	-40° / +55° C	-40° / +55° C	-40° / +55° C
Size	300 x 300 x 70 mm	284 x 174 x 81 mm (Trinity-50TDD/N) Ø 610 x 250 incl mounting brackets (Antenna)	284 x 174 x 81 mm
Weight per unit	1.9 Kg	2.0 Kg (Trinity-50TDD/N) 2.5 Kg incl mounting bracket (Antenna)	2.0 Kg

Trinity-50TDD/23

Aggregated Throughput, Mbps vs Distance, km

Rate	Dist.	1	5	10	15	20	25	30	35	40	45	50
6	4.6	4.6	4.4	4.4	4.2	4.0	4.0	3.8	3.6	3.6	3.4	
9	7.2	7.0	6.8	6.6	6.4	6.2	6.0	5.8	5.6	5.4	5.2	
12	9.6	9.4	9.2	9.0	8.6	8.4	8.2	8.0	7.6	7.4	7.2	
18	14.6	14.2	13.8	13.6	13.2	12.8	12.4	12.0	11.6	11.2	10.8	
24	19.6	19.2	18.6	18.2	17.6	17.2	16.6	16.2	15.6	15.0	14.6	
36	29.4	28.8	28.0	27.4	26.6	25.8	25.0	24.4	23.6	22.8	22.0	
48	39.4	38.6	37.6	36.6	35.6	34.6	33.6					
54	40.0	40.0	40.0	40.0	40.0							

Green is within 6dB margin, ETSI configuration (Max 1W Tx output)

Grey is within 6dB margin, max output power, not allowed according to ETSI regulations.

Trinity-50TDD/28

Aggregated Throughput, Mbps vs Distance, km

Rate	Dist.	1	5	10	15	20	25	30	35	40	45	50
6	4.6	4.6	4.4	4.4	4.2	4.0	4.0	3.8	3.6	3.6	3.4	
9	7.2	7.0	6.8	6.6	6.4	6.2	6.0	5.8	5.6	5.4	5.2	
12	9.6	9.4	9.2	9.0	8.6	8.4	8.2	8.0	7.6	7.4	7.2	
18	14.6	14.2	13.8	13.6	13.2	12.8	12.4	12.0	11.6	11.2	10.8	
24	19.6	19.2	18.6	18.2	17.6	17.2	16.6	16.2	15.6	15.0	14.6	
36	29.4	28.8	28.0	27.4	26.6	25.8	25.0	24.4	23.6	22.8	22.0	
48	39.4	38.6	37.6	36.6	35.6	34.6	33.6	32.6	31.6	30.4	29.4	
54	40.0	40.0	40.0	40.0	40.0	38.8	37.8	36.6	35.4	34.4	33.2	

Green is within 6dB margin, ETSI configuration (Max 1W Tx output)

Grey is within 6dB margin, max output power, not allowed according to ETSI regulations.

