



Variant comparison

VARIANT	LEAPS FLEX	LEAPS PRO	LEAPS NAV	PANS PRO	PANS
Summary					
Vendor	LEAPS	LEAPS	LEAPS	LEAPS	Decawave
Developer	LEAPS	LEAPS	LEAPS	LEAPS	LEAPS
Supported profiles	Profile 1, 2	Profile 1, 2, 3, 4, 5	Profile 5	Profile 0	Profile 0
Performance	See profile comparison for more details				
Firmware update and maintenance	yes	yes	yes	-	-



Solution comparison

	LEAPS	PANS PRO	PANS
Summary			
Vendor	LEAPS	LEAPS	Decawave
Developer	LEAPS	LEAPS	LEAPS
Use in production deployment	Yes	Yes	Limited
Extendable with more devices	Yes	Yes	Yes
Firmware update and maintenance	Yes	Bug fixes	No
Software features			
See profile comparison for more details			
Location capability	TWR, TDOA, RTDOA	TWR only	TWR only
Max. update rate	up to 50 Hz	10 Hz	10 Hz
Total update capacity	up to 700 Hz	150 Hz	150 Hz
Max. measurements per update	up to 30	4	4
Routing UWB backhaul	Yes	No	No
Security	Yes	No	No
Data server	Advanced	Advanced	Basic (duplicity filtration)
Data latency on server	50 ms (depends on profile)	update rate + 50 ms	update rate + 50 ms
Remote events and commands	Yes	Yes	No
Bluetooth API	Advanced (new)	Basic	Basic
Bluetooth Security	Yes	No	No
LEAPS / DRTLs Android Manager	Advanced	Basic	Basic
Hardware features			
Mounting options	Camera mount	Camera mount	Unknown
Enclosures for all devices	Yes	Yes	Partially (not for RPI)
Power supply	USB, 10-36V, PoE, battery backup	USB, 10-36V, PoE, battery backup	USB, 5V, battery backup
Connectivity	Ethernet WIFI (will be available)	Ethernet WIFI (will be available)	RPI (Ethernet, WIFI)
Gateway using Raspberry PI (RPI)	No	No	Yes



Profile comparison

	PROFILE 0	PROFILE 1	PROFILE 2	PROFILE 3	PROFILE 4	PROFILE 5
Availability	Jan 2020	Jan 2020	Jan 2020	Q1 2020	Q2 2020	Jan 2020
LEAPS Variant	PANS, PANS PRO	LEAPS FLEX/PRO	LEAPS FLEX/PRO	LEAPS PRO	LEAPS PRO	LEAPS NAV/PRO
Supported hardware	DWM1001	DWM1001	DWM1001	DWM1001	DWM1001	DWM1001
Overview						
Summary	<p><i>Very flexible system capable of navigation and tracking with simple deployment, low infrastructure cost and flexible Tag configuration.</i></p> <p><i>Applications include navigation of visitors in museums, robots in agriculture, and vehicles in warehouse or equipments in construction.</i></p> <p><i>Tracking applications include stage lighting control, motorbikes inventory in parking lots or customer's behaviour study in groceries.</i></p> <p><i>Data telemetry permits the creation of network of IoT devices to remotely collect data and to control the devices with deterministic timing.</i></p>			<p><i>Tracking of fast moving objects with high accuracy, low latency and deterministic timing like athletes, forklifts and vehicles.</i></p> <p><i>Navigation of fast moving objects like AGVs, drones and robots.</i></p>		<p><i>Very low power tracking of objects like assets in warehouses, personnel in hospitals, forklifts in logistics and animals in agriculture.</i></p> <p><i>Navigation of very fast moving objects like cars in an underground parking garage, drones in buildings and vehicles in warehouses.</i></p> <p><i>This allows low cost infrastructure.</i></p>
Location modes	Navigation, Tracking	Navigation, Tracking	Navigation, Tracking	Navigation, Tracking	Tracking	Navigation
Location technique (see FAQ)	TWR	TWR, RTDOA	TWR, RTDOA	TWR, TTDOA, RTDOA	TDOA	RTDOA
Total update capacity - Tag	TWR: 150 Hz	TWR: 150 Hz RTDOA: 10 Hz	TWR: 330 Hz RTDOA: 10 Hz	TWR/TTDOA: TBD RTDOA: 20 Hz	TDOA: TBD	RTDOA: 50 Hz
Max. Tag Update rate	10Hz	10Hz	10Hz	20Hz	TBD	50Hz
Location engine	Tag	Tag	Tag	TWR/TTDOA: Server RTDOA: Tag	Server	Tag
User data (Telemetry)	Uplink, Downlink	Uplink, Downlink	Uplink, Downlink	Uplink, Downlink	No	No
User data length per update [Bytes]	34 B	26 B	26 B	26 B	No	No
UWB Backhaul (see FAQ)	Non-routing	Routing	Non-routing	Non-routing	No	No
Ethernet backhaul (see FAQ)	Optional	Optional	Optional	Required	Required	No
Security	No	Yes	Yes	Yes	TBD	Yes
Tag slot reservation (see FAQ)	Roaming	Roaming	Roaming	Dedicated	Probabilistic	-
Suitable area	Open-space, complex building	Open-space, complex building	Open-space, complex building	Open-space, complex building	Open-space	Open-space, complex building
Infrastructure cost	Low / Medium	Low / Medium	Low / Medium	Medium / High	Medium / High	Low
LEAPS Android Manager	Yes	Yes	Yes	Yes	Yes	Yes
LEAPS Web Manager	Yes	Yes	Yes	Yes	Yes	Yes
Data server	PANS: Basic (duplicity filtration) PANS PRO: Advanced	Advanced	Advanced	Advanced	Advanced	No

Data Server API	PANS: MQTT 3.1.1 PANS PRO: Various connectors (MQTT, AWS IoT, ...)	Various connectors (MQTT, AWS IoT, ...)	Various connectors (MQTT, AWS IoT, ...)	Various connectors (MQTT, AWS IoT, ...)	Various connectors (MQTT, AWS IoT, ...)	No
On-module API (see FAQ)	Bluetooth, UART, SPI, Debug Shell, User Application	Bluetooth (new, encrypted), UART, SPI, USB, Debug Shell	Bluetooth (new, encrypted), UART, SPI, USB, Debug Shell	Bluetooth (new, encrypted), UART, SPI, USB, Debug Shell	Bluetooth (new, encrypted), UART, SPI, USB, Debug Shell	Bluetooth (new, encrypted), UART, SPI, USB, Debug Shell
Uplink data availability (see FAQ)	Location only: Bluetooth, SPI, Shell Location & User data: Data Server	Bluetooth, UART, SPI, Data Server	Bluetooth, UART, SPI, Data Server	Bluetooth, UART, SPI, Data Server	Bluetooth, UART, SPI, Data Server	-
Power consumption	Tag: low/medium Anchor: medium	Tag: low/medium Anchor: medium	Tag: low/medium Anchor: medium	Tag: low/medium Anchor: high	Tag: low Anchor: high	Tag: low/medium Anchor: medium
PROFILE 0 PROFILE 1 PROFILE 2 PROFILE 3 PROFILE 4 PROFILE 5						
Tag Technical Details						
Max. update rate - Tag (Location Data, User Data)	10 Hz (100 ms)	10 Hz (100 ms)	10 Hz (100 ms)	20 Hz (50 ms)	TBD	50 Hz (20 ms)
Max. uplink latency - Tag (Location Data, User Data)	On-module API: 10 ms Data Server API: update rate + 50 ms	On-module API: 10 ms Data Server API: update rate + 50 ms + number of hops * 100 ms	On-module API: 10 ms Data Server API: update rate + 50 ms	On-module API: 10 ms Data Server API: 50 ms	Data Server API: 50 ms	On-module API: 10 ms
Max. downlink latency - Tag (User Data)	On-module API: update rate + 50 ms	On-module API: update rate + 50 ms + number of hops * 100 ms	On-module API: update rate + 50 ms	On-module API: update rate + 50 ms	-	-
Total update capacity - Tag	TWR: 150 Hz	TWR: 150 Hz RTDOA: 10 Hz	TWR: 330 Hz RTDOA: 10 Hz	TWR/TTDOA: TBD RTDOA: 20 Hz	TDOA: TBD	RTDOA: 50 Hz
Total number of nodes - Tag	TWR Spread area deployment: virtually unlimited. Small area deployment: depends on the update rate - e. g. 15 Tags @ 10 Hz, 150 Tags @ 1 Hz, 1500 Tags @ 0.1 Hz, etc.	TWR Spread area deployment: virtually unlimited. Small area deployment: depends on the update rate - e. g. 15 Tags @ 10 Hz, 150 Tags @ 1 Hz, 1500 Tags @ 0.1 Hz, etc. RTDOA Unlimited	TWR Spread area deployment: virtually unlimited. Small area deployment: depends on the update rate - e. g. 33 Tags @ 10 Hz, 330 Tags @ 1 Hz, 3300 Tags @ 0.1 Hz, etc. RTDOA Unlimited	TWR, TTDOA Depends on the update rate - TBD RTDOA Unlimited	TDOA Spread area deployment: virtually unlimited. Small area deployment: depends on the update rate - TBD	RTDOA Unlimited
Max. measurements per update - Tag	Per location update TWR: 4 raw ranging values	Per location update TWR: 4 raw ranging values RTDOA: TBD	Per location update TWR: 4 raw ranging values RTDOA: TBD	Per location update TWR: TBD TTDOA: TBD RTDOA: TBD	Per location update TDOA: TBD	Per location update RTDOA: TBD
Supported update rate	100 ms to 60 s (100 ms step)	100 ms to 60 s (100 ms step)	100 ms to 60 s (100 ms step)	TBD	TBD	20 ms to 60 s (20 ms step)
Stationary detection and update adaptation (using accelerometer)	Yes	Yes	Yes	Yes	Yes	Yes
Downlink events and commands - Tag (see FAQ)	No	Yes	Yes	Yes	No	No
PROFILE 0 PROFILE 1 PROFILE 2 PROFILE 3 PROFILE 4 PROFILE 5						

Anchor Technical Details						
Max. update rate - Anchor (User Data)	1/120 Hz (120 s)	TBD	TBD	TBD	No	No
Total number of nodes - Anchor	Spread area deployment: virtually unlimited. Small area deployment: 30 Anchors	Spread area deployment: virtually unlimited. Small area deployment: 30 Anchors	Spread area deployment: virtually unlimited. Small area deployment: 30 Anchors	Spread area deployment: virtually unlimited. Small area deployment: 30 Anchors	Spread area deployment: virtually unlimited. Small area deployment: 30 Anchors	Spread area deployment: virtually unlimited. Small area deployment: 30 Anchors
Downlink events and commands - Anchor (see FAQ)	No	Yes	Yes	Yes	Yes	No
PROFILE 0 PROFILE 1 PROFILE 2 PROFILE 3 PROFILE 4 PROFILE 5						
Security						
UWB encryption	Yes	Yes	Yes	Yes	Yes	Yes
Security (see FAQ)	No	Secure key storage, secure boot, node authentication, node access revoke, changes in infrastructure detection, whole chain security	Secure key storage, secure boot, node authentication, node access revoke, changes in infrastructure detection, whole chain security	Secure key storage, secure boot, node authentication, node access revoke, changes in infrastructure detection, whole chain security	TBD	Secure key storage, secure boot, changes in infrastructure detection
Bluetooth encryption	No	Yes	Yes	Yes	Yes	Yes
Tag privacy	No	TWR: No RTDOA: Yes	TWR: No RTDOA: Yes	TWR, TTDOA: No RTDOA: Yes	No	Yes
PROFILE 0 PROFILE 1 PROFILE 2 PROFILE 3 PROFILE 4 PROFILE 5						
Other features						
Network collision avoidance, detection and resolution	Yes	Yes	Yes	Yes	-	Yes
UWB network co-existence	Yes	Yes	Yes	Yes	No	Yes
UWB firmware update	Yes (distributed automatically)	Yes (distributed automatically)	Yes (distributed automatically)	Yes (distributed automatically)	Yes (anchor only, distributed automatically)	Yes (distributed automatically)
BLE firmware update	Yes	No	No	No	No	No
High accuracy time trigger for synchronous devices	No	TBD	TBD	TBD	No	TBD
QoS	No	TBD	TBD	TBD	No	No
PROFILE 0 PROFILE 1 PROFILE 2 PROFILE 3 PROFILE 4 PROFILE 5						
Information for Geeks						
On-module storage (configuration, user data)	Yes	Yes	Yes	Yes	Yes	Yes
TLS support over Ethernet	No	TLS 1.2+	TLS 1.2+	TLS 1.2+	TLS 1.2+	No
UWB Encryption	AES-128	AES-128	AES-128	AES-128	No	AES-128
Bluetooth encryption	No	AES-128	AES-128	AES-128	AES-128	AES-128
Security features	Optimized for device with memory and power constraints, low communication overhead	Hardware root of trust, secure boot, node authentication, key exchange, node access revoke, changes in infrastructure detection, whole chain security, optimized for device with memory and power constraints, low communication overhead	Hardware root of trust, secure boot, node authentication, key exchange, node access revoke, changes in infrastructure detection, whole chain security, optimized for device with memory and power constraints, low communication overhead	Hardware root of trust, secure boot, node authentication, key exchange, node access revoke, changes in infrastructure detection, whole chain security, optimized for device with memory and power constraints, low communication overhead	Hardware root of trust, secure boot, anchor authentication	Hardware root of trust, secure boot, anchor authentication, changes in infrastructure detection, optimized for device with memory and power constraints, low communication overhead

Designed to be resistant against	Data replay, unauthorized nodes, extension attack, data extraction, power interruption, DoS	Data replay, unauthorized nodes, extension attack, data extraction, power interruption, DoS	Data replay, unauthorized nodes, extension attack, data extraction, power interruption, DoS	Data replay, unauthorized nodes, extension attack, data extraction, power interruption, DoS	TBD	Data replay, unauthorized nodes, extension attack, data extraction, power interruption, DoS
Operating system	eCos RTOS	Zephyr RTOS	Zephyr RTOS	Zephyr RTOS	Zephyr RTOS	Zephyr RTOS
Bluetooth stack	BT 4.2, SoftDevice	BT 5.0, Zephyr	BT 5.0, Zephyr	BT 5.0, Zephyr	BT 5.0, Zephyr	BT 5.0, Zephyr



Development Kits comparison

VARIANT	LEAPS FLEX	LEAPS PRO	LEAPS NAV	PANS PRO	MDEK1001 PANS
AVAILABILITY	Subscribe to our mailing list to get informed when our products are available				via Decawave
Summary					
What can you do with the kit?	System evaluation and proof of concept deployment				Evaluation
Use in production deployment	Yes	Yes	Yes	Yes	Limited
Extendable with more devices	Yes	Yes	Yes	Yes	Yes
Update from MDEK1001 PANS to LEAPS (limited, only for evaluation purpose)	Optional	No	Optional	-	-
Hardware features					
Mounting options	Camera mount	Camera mount	Camera mount	Camera mount	Unknown
Enclosures for all devices	Yes	Yes	Yes	Yes	Partially (not for RPI)
Power supply	USB, 10-36V, PoE, battery backup	USB, 10-36V, PoE, battery backup	USB, 10-36V, battery backup	USB, 10-36V, PoE, battery backup	USB, 5V, battery backup
Connectivity	Ethernet WIFI (will be available)	Ethernet WIFI (will be available)	-	Ethernet WIFI (will be available)	RPI (Ethernet, WIFI)
Gateway using Raspberry PI (RPI)	No	No	No	No	Yes
Content					
LEAPS hardware and software	To be specified				-
DWM1001-DEV	-	-	-	-	12
PANS Software Package	-	-	-	-	Yes



Technical support pricing

	COMMUNITY	BUSINESS 3 MONTHS	BUSINESS 12 MONTHS	ENTERPRISE
Pricing	Free	Contact us for pricing	Contact us for pricing	Contact us for pricing
Online documentation access	Always	Always	Always	Always
Tickets and issues	Public Decawave forum	Private tracking	Private tracking	Private tracking
Support availability	Best efforts	Business hours (CET time)	Business hours (CET time)	Business days
First response time (E-mail, tracking system)	Best efforts	24 hours	24 hours	8 hours
Online support (Skype, Phone, ..)	No	Yes	Yes	Yes
Online training	No	No	Optional	Optional
Onsite training and support	No	No	No	Optional
Custom hardware support	No	No	No	Optional
Custom integration support	No	No	No	Optional
PANS source code availability	No	No	No	Optional
LEAPS source code availability	No	No	No	No