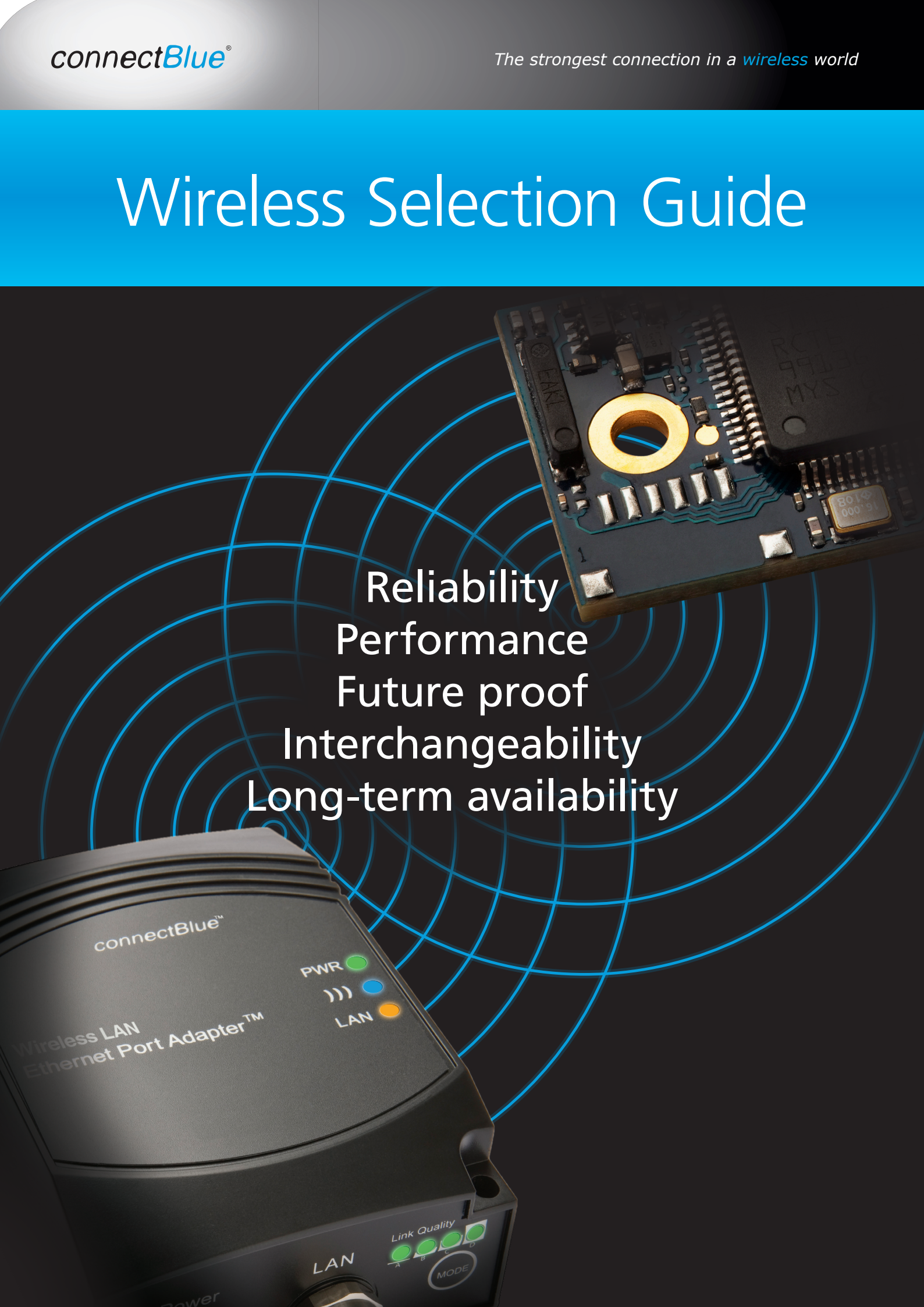



# Wireless Selection Guide


The background of the slide features a dark blue gradient with a series of concentric blue circles emanating from the bottom left, representing a wireless signal. In the top right, there is a close-up of a blue printed circuit board (PCB) with various electronic components, including a prominent gold-colored circular component. In the bottom left, a portion of a black plastic device is visible, which is a Wireless LAN Ethernet Port Adapter. It has several status LEDs and labels. The text in the center of the slide lists five key selection criteria for wireless technology.

Reliability  
Performance  
Future proof  
Interchangeability  
Long-term availability

connectBlue™

PWR 

))) 

LAN 

Wireless LAN  
Ethernet Port Adapter™

Link Quality  
A B C D    

LAN

MODE

## Defining and leading wireless

With reliable and highly robust communication

**“Wireless” is not a technology – it’s a commitment. It’s not about what works. It’s about how well it works. For over a decade, we have worked with state-of-the art Industrial and Medical Ready wireless solutions, designed and tested for demanding applications and environments. We drive the wireless technology evolution and thereby we define what will be the wireless future.**

Our offering consist of ready-to-embed modules and ready-to-use products based on Classic Bluetooth technology, Bluetooth low energy technology and Wireless LAN (WLAN). We also offer custom design solutions based on these technologies and IEEE 802.15.4 / ZigBee.

### Why choose connectBlue?

Fanciful sales talk is easy, but we stick to facts. And there are some clear facts that set us apart from any other wireless provider on the market.

#### Long-term Availability

Since the start in 2000, our offering has continuously evolved and yet our form factor has remained unchanged with consistent electrical, mechanical, software and antenna interfaces.

In fact, we have customers who have shipped products for 12 years with a minimum of software changes and no hardware changes on their Printed Circuit Board (PCB).

#### Outstanding Reliability

Our products are tailored to fit the toughest of situations; the products offer an extended temperature range (-40° to +85°C), have a built-in watchdog timer for secure system design, and operate faultless 24/7 regardless of EMC conditions, dust, humidity, temperature variations, and rapid movement changes.

#### Best Performance

We own, develop and maintain our Bluetooth stack and WLAN software drivers. Not only do we own these, over the years we have used them for several different chipset manufacturers and designs, tuning and expanding them to get the best performance and controlled latency, throughput and power consumption. The products have customizable configuration parameters and are radio type approved for US, European, Canadian, Japanese markets as well as are compliant with EMC, Safety and Medical standards, and the Bluetooth qualification program.





## Wireless Technology Comparison

WIRELESS STANDARD	Classic Bluetooth technology	Bluetooth low energy technology	ZigBee / IEEE 802.15.4	Wireless LAN (WLAN)	
Data throughput	+/-	-	-	++	
Robustness	++	++	+/-	+/-	
Range	10-300m	10-250m	10-200m+mesh	50-300m	
Local system density	++	++	+	-	
Roaming	+	N/A	N/A	++	
Large scale network	-	+	++	+/-	+ = Good
Low latency	+++	++	+	+/-	++ = Strong
Connectionset-upspeed	-	++	++	+/-	+++ = Very strong
Power consumption	+	+++	++	-	+/- = Average
Cost	+	++	+	-	- = Weak

### Interchangeability

The connectBlue standard form factor and connectors allow for interchangeability between Bluetooth technology and WLAN. But that is not all; you can also change products within a product family seamlessly. In other words, you get complete system design flexibility.

### Quality Manufacturing & Support

Our head office lies in the wireless epicenter of Southern Sweden. There, we also utilize the resources from external, high quality manufacturing facilities (ISO9001, ISO13485, etc.) where each product is individually tested and tuned for consistent performance. We have local German and US sales offices and first-line support backed by the US and European technical teams allowing for a virtually 24 hour coverage.

### Future-proof Dependability

We drive the technology development in the wireless standard forums. We track and even promote the new standards within our product portfolio.

### Which wireless technology fits best?

One wireless technology cannot offer all the features and strengths that fit the various application requirements. We help you find the solution that best fits your needs.

- Choose Classic Bluetooth technology for robust communication in rough environments. Robust features include Adaptive Frequency

Hopping (AFV), Forward Error Correction (FEC), automatic power control and high system density (several connections in the same radio space).

- Choose Bluetooth low energy technology when you want to connect to battery-operated small devices, smartphones, tablets, gateways, etc.
- Choose IEEE802.15.4/ZigBee when building large networks with mesh functionality for small devices with low demands on data throughput.
- Choose WLAN 802.11 a, b, g, n (commonly referred to as Wi-Fi) if you want to connect to an existing LAN / WLAN infrastructure or create high throughput ad-hoc networks.

### Bluetooth Single-mode & Dual-mode

Classic Bluetooth implementations are single-mode implementations. But with the addition of Bluetooth low energy there are also single-mode Bluetooth low energy devices known as Bluetooth Smart devices.

Dual-mode devices, also known as Bluetooth Smart Ready devices, include both Bluetooth low energy and Classic Bluetooth technologies. That means that you can, for instance, in parallel connect a number of Classic Bluetooth single-mode modules (OBS418/419/etc.) as well as a number of Bluetooth low energy single-mode modules (OLS425/426) to a Bluetooth dual-mode module (OBS421).

## Interchangeable and future safe

All products share the connectBlue standard for form factor and fitting, connectors, antennas as well as configuration and control software tools

### Where does “wireless” fit you?

#### Wireless Serial Communication

Developed to meet tough demands, connectBlue products handle robust serial communication (UART, RS232/422/485) with point-to-point, multi-point cable replacement or multi-drop functionality.

#### Wireless Ethernet Communication

The connectBlue Rugged Ethernet Port Adapters are especially well-suited for replacing Ethernet cables either in point-to-point applications or in a wireless infrastructure where seamless roaming is important. For those that prefer to embed modules in host devices, the connectBlue Wireless LAN SPI / SDIO modules provide fully radio type approved dual-band solutions.

#### Wireless Signal Acquisition and I/O

Digital or analog signals can be wirelessly mirrored or controlled from a Bluetooth equipped device using a connectBlue low energy module OLP425.

#### Wireless Customer Specific Software Development Platforms

The connectBlue platforms offer a possibility to embed customer specific software in the modules to save development cost, time to market, and product cost.

#### Wireless Custom Design Development

Often, our custom design development is based on available connectBlue software and hardware solutions but it could also be a completely new design if so required.

#### WIRELESS ADVANTAGES

- Greater mobility and possibility to move devices and connect to smartphones and tablets freely without constraining cables
- Bypassing long distances and areas where cables cannot physically fit
- Fast and easy installation and commissioning
- High flexibility if there is a need to modify an installation
- Increased personal safety by not having to be physically close to a device during configuration and/or maintenance
- Easy integration of devices into the network

### What “wireless” solution should you buy?

Based on your particular use case, connectBlue has a solution that fits you. Choose between ready-to-embed wireless modules or ready-to-use wireless products – all developed to satisfy industrial and medical needs on robustness, time-to-market and performance.

#### Ready-to-Use Products

If you wish to implement a complete wireless product, we offer a wide range of ready-to-use industrial products that all improve production, economy and safety. With these products, you can be up and running quickly and as they have an IP65-classed housing, they operate flawlessly 24/7 under the harshest of conditions.



#### Ready-to-Embed Modules

By embedding our modules, you save on cost and time compared to if you develop the wireless solution on your own. Developing your own solution takes 6-18 months and costs 150-500kEUR / 200-650kUSD depending on technology, frequencies / channels, test system, radio type approvals, etc. And 3-5 years later when the chipset reaches its last time buy, you have to do it all over again. connectBlue offers a wide range of modules, fully certified and pre-tested as well as a full range of accessories.



#### Ready-to-Customize Platforms

You can use the Bluetooth platform modules to reduce your hardware costs by implementing your application on top of the integrated stack. For instance, customer applications can be run in the OLP425 and OBS421. Possible applications include protocol converter, filtering and signal processing, and gateway using multiple UARTs.





## Useful connectBlue features

This guide covers all the features of the connectBlue product range, but there are some of these that we want to cover in depth.

### Seamless Roaming & Redundancy

With a variety of wireless technologies operating in the same radio space, the performance on the existing wireless connections can be affected or even terminated during the necessary scanning for new wireless networks.

With the connectBlue seamless roaming, the actual switch-over takes place in just a few milliseconds using standard access points. Another advantage is the opportunity to combine roaming with redundancy.

Further, since we offer solutions across various technologies, we can offer the most robust solution for a particular use case scenario.

### 2.4 and 5GHz Dual-band Support

Besides WLAN IEEE 802.11 b, g, n other wireless technologies like Bluetooth technology, IEEE 802.15.4 / ZigBee / Wireless HART and several proprietary technologies operate in the 2.4GHz band. To make sure that the WLAN solution is robust, one can focus on IEEE 802.11 a (5GHz) for the manufacturing and M2M communication. connectBlue offers dual-band functionality and an expanded frequency channel range in the 5GHz ISM band. See support details in the tables.

### iPhone/Android Support

connectBlue offers WLAN and Bluetooth module support for Android / Apple iPhone / iPod touch / iPad connectivity which makes data handling easier in industrial and medical applications. The modules are tested and approved by Apple. See support details in the tables.

#### USEFUL HOW-TO-DO'S

connectBlue's website features 15+ in depth articles and white papers that detail the possibilities as well as best practices in different wireless technologies in tough industrial and medical environments.

Visit [www.connectblue.com/about-us](http://www.connectblue.com/about-us) for more information.



## Ready-to-use products for the robust need

Products that improve production, economy and safety. IP65 classed housing, fully certified and tested.



Rugged Serial  
Port Adapter  
RBS421s



Access  
Point  
RBE221s



Rugged Ethernet  
Port Adapter  
RBE221i



Rugged Ethernet  
Port Adapter  
RWE231i



Rugged Ethernet  
Port Adapter  
RWE241i

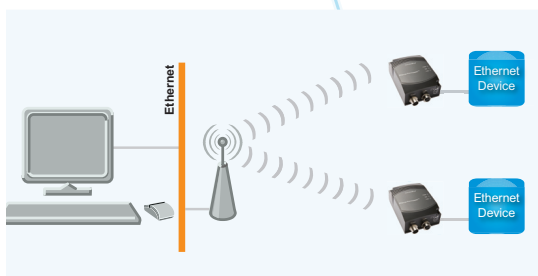


Rugged Ethernet  
Port Adapter  
RWE251s

	ClassicBluetooth & Bluetooth low energy (Smart Ready)	Classic Bluetooth technology	Classic Bluetooth technology	Wireless LAN (WLAN)	Wireless LAN (WLAN)	Wireless LAN (WLAN)
<b>WIRELESS STANDARD</b>						
<b>STANDARD SPECIFICATION</b>						
Bluetooth qualification	v4.0	v2.1+EDR	v2.1+EDR	-	-	-
Bluetooth profiles	SPP DUN PAN	PAN	PAN	-	-	-
Wireless LAN version	-	-	-	802.11 b, g, n (2.4 GHz)	802.11 a, n (5 GHz)	802.11 a, b, g, n (dual-band)
<b>RADIO</b>						
Antenna	External	External	Internal	Internal	Internal	External
Max output power	13 dBm	13 dBm	13 dBm	20 dBm	11 dBm	20 dBm
Range <sup>Note 2</sup>	300 m	300 m	300 m	400 m	200 m	400 m
2.4 GHz channels	1-79	1-79	1-79	1-13	-	1-13
5 GHz channels	-	-	-	-	36-48, 52-140 (U-NII Band 1, 2, 2e)	36-48, 52-140 (U-NII Band 1, 2, 2e)
<b>TYPE APPROVALS</b>						
US (FCC)	Yes	Yes	Yes	Yes	Yes	Yes
Europe (ETSI R&TTE)	Yes	Yes	Yes	Yes	Yes	Yes
Canada (IC RSS)	Yes	Yes	Yes	Yes	Yes	Yes
Japan (MIC - formerly TELEC)	-	Yes	Yes	Yes	-	Yes (2.4 GHz only)
Hazardous location UL/CSA Class 1 Div 2	-	Yes	Yes	Yes	Yes	Yes
<b>INTERFACE</b>						
RS232	Yes	-	-	-	-	-
RS422/485	Yes	-	-	-	-	-
Max baudrate	460.8 k	-	-	-	-	-
Flow control on/off	Yes	-	-	-	-	-
Ethernet	-	Yes	Yes	Yes	Yes	Yes
<b>SOFTWARE FEATURES</b>						
AT command support	Yes	Yes	Yes	Yes	Yes	Yes
Web configuration	-	Yes	Yes	Yes	Yes	Yes
Max number of slaves	7	7	1	1	1	1
Extended Data Mode protocol	Yes	-	-	-	-	-
Security	Simple Pairing	Simple Pairing	Simple Pairing	WPA2, Enterprise, PEAP, LEAP	WPA2, Enterprise, PEAP, LEAP	WPA2, Enterprise, PEAP, LEAP
Quality of Service (QoS)	Yes	Yes	Yes	-	-	-
Additional features	Repeater, connectBlue, Bluetooth Low Energy Serial Port Service	Wireless Access Point (NAP)	Wireless Ethernet Bridge, Personal Area Network User (PANU)	Wireless Ethernet Bridge, Wireless LAN Client, Seamless Roaming, Redundancy	Wireless Ethernet Bridge, Wireless LAN Client, Seamless Roaming, Redundancy	Wireless Ethernet Bridge, Wireless LAN Client, Seamless Roaming, Redundancy
<b>POWER</b>						
Power supply voltage	8 - 30 VDC	9 - 30 VDC	9-30 VDC	9 - 30 VDC	9 - 30 VDC	9 - 30 VDC
Current cons. (min)	13 mA @30V	35 mA @30V	35 mA @30V	47 mA @30V	47 mA @30V	47 mA @30V
Current cons. (average Tx)	24 mA @30V	43 mA @30V	43 mA @30V	59 mA @30V	59 mA @30V	59 mA @30V
<b>CONNECTORS</b>						
9-pin D-SUB	Yes	-	-	-	-	-
M12	-	Yes	Yes	Yes	Yes	Yes
<b>MECHANICAL</b>						
Operating temperature	-30 to +85° C	-30 to +65° C	-30 to +65° C	-40 to +65° C	-40 to +65° C	-30 to +65° C
Mounting holes	Yes	Yes	Yes	Yes	Yes	Yes
Housing	Metal, IP 65	Plastic, IP 65	Plastic, IP 65	Plastic, IP 65	Plastic, IP 65	Plastic, IP 65
Dimensions (mm)	76x85x35	91x66x36	91x66x36	91x66x36	91x66x36	91x66x36



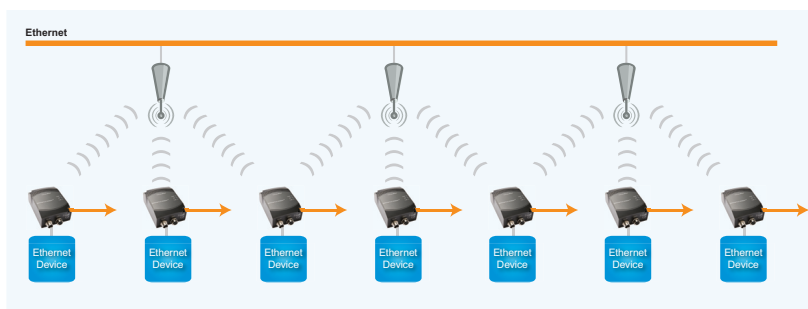
Serial Port Adapters (SPA) replacing the serial cables with wireless connections in point-to-point and multidrop setups.



WLAN Ethernet Port Adapters (EPA) for connecting Ethernet devices to an Ethernet infrastructure via a WLAN Access Point.



Ethernet Port Adapters (EPA) replacing the Ethernet cable with wireless connection. The connection between the EPAs is point-to-point in Bluetooth technology and ad-hoc in WLAN.



WLAN / Bluetooth Ethernet Port Adapter (EPA) connecting to an Ethernet infrastructure via multiple Access Points. The Ethernet Port Adapter supports several modes of superior roaming between available Access Points, including seamless roaming.



## Ready-to-embed modules that are certified and fully tested

Benefit from the advantages of low-power modules that are fully certified and tested



SerialPortModule  
OBS418



SerialPortModule  
OBS419



SerialPortModule  
OBS421



iOS Serial Port  
Module OBS424\*<sup>Note4</sup>



LowEnergyPlatform  
Module OLP425



SerialPortModule  
OLS425 / OLS426

	SerialPortModule OBS418		SerialPortModule OBS419		SerialPortModule OBS421		iOS Serial Port Module OBS424* <sup>Note4</sup>		LowEnergyPlatform Module OLP425		SerialPortModule OLS425 / OLS426	
WIRELESS STANDARD	Classic Bluetooth technology		Classic Bluetooth technology		Classic Bluetooth & Bluetooth low energy (Smart Ready)		Classic Bluetooth & Bluetooth low energy (Smart Ready)		Bluetooth low energy technology (Bluetooth Smart)		Bluetooth low energy technology (Bluetooth Smart)	
STANDARD SPECIFICATION												
Bluetooth qualification	v2.1		v2.1+EDR		v4.0		v4.0		v4.0		v4.0	
Bluetooth profiles <sup>Note 4</sup>	SPP DUN		SPP DUN PAN		SPP DUN PAN		SPP PAN		-		-	
Wireless LAN version	-		-		-		-		-		-	
RADIO												
Antenna type	Internal	External	Internal	External	Internal	External	Internal	External	Internal	External	Internal	External
Max output power incl. antenna	6 dBm	8 dBm	6 dBm	8 dBm	11 dBm	13 dBm	11 dBm	13 dBm	3 dBm	6 dBm	3 dBm	6 dBm
Range	75 m	150 m	75 m	150 m	300 m	300 m	300 m	300 m	50 m	200 m	50 m	200 m
2.4 GHz channels	1-79		1-79		1-79		1-79		1-39		1-39	
5 GHz channels	-		-		-		-		-		-	
TYPE APPROVALS												
US (FCC)	Yes		Yes		Yes		Yes		Yes		Yes	
Europe (ETSI R&TTE)	Yes		Yes		Yes		Yes		Yes		Yes	
Canada (IC RSS)	Yes		Yes		Yes		Yes		Yes		Yes	
Japan (MIC - formerly TELEC)	Yes		Yes		Yes		Yes		Yes		Yes	
INTERFACE												
UART Logic-level	Yes		Yes		Yes		Yes		Yes		Yes	
RS232	Option <sup>Note 3</sup>		Option <sup>Note 3</sup>		Option <sup>Note 3</sup>		Option <sup>Note 3</sup>		-		-	
RS422/485	Option <sup>Note 3</sup>		Option <sup>Note 3</sup>		Option <sup>Note 3</sup>		-		-		-	
Max baudrate	460.8 k		1.25 M		1.5 M		1.5 M		115.2 k		115.2 k	
Flow control on/off	Yes		Yes		Yes		Yes		Yes		Yes	
SPI	-		-		-		-		Yes		-	
SDIO	-		-		-		-		-		-	
I/O pins	9 digital		9 digital		9 digital		9 digital		18 dig, 4 AD conv		11 digital	
FEATURES												
Throughput	350 kbps		950 kbps		1.3 Mbps		1.3 Mbps		-		TBD	
AT command support	Yes		Yes		Yes		Yes		-		Yes	
Max number of slaves	1		3		7		7		3		1	
Extended Data Mode protocol	-		Yes		Yes		Yes		-		-	
Security	Simple Pairing		Simple Pairing		Simple Pairing		Simple Pairing		Simple Pairing		Simple Pairing	
Quality of Service (QoS)	Yes		Yes		Yes		Yes		-		-	
Customer application platform	-		-		Yes		-		Yes		-	
Android support	Yes		Yes		Yes		Yes		Yes		Yes	
iPhone/iPad support <sup>Note 4</sup>	-		Yes (via host)		Yes (via host)		Yes (on board)		Yes		Yes	
Additional features			Repeater		Repeater, connectBlue Bluetooth Low Energy Serial Port Service		Repeater connectBlue Bluetooth Low Energy Serial Port Service		Options: battery holder, temperature sensor, accelerometers, etc.		connectBlue Low Energy Serial Port Service	
POWER												
Power supply voltage	3.0 - 6.0 VDC		3.0 - 6.0 VDC		3.0 - 6.0 VDC		3.0 - 6.0 VDC		2.0 - 3.6 VDC		2-3.6 VDC / 3-6 VDC	
Current cons. (min)	12 mA @3.0V		0.6 mA @3.0V		0.6 mA @3.0V		2 mA @3.0V		0.4 µA @2.0V		0.4 µA / 6.7 µA	
Current cons. (average Tx)	20 mA @3.0V		20 mA @3.0V		44 mA @3.0V		46 mA @3.0V		-		10 mA @ 3.0V	
CONNECTORS												
Board-to-board	Yes		Yes		Yes		Yes		-		- / Yes	
20 pin header	-		-		-		-		-		-	
JST (6-pol)	-		Option		Option		Option		Option		-	
Solder pads	Yes		Yes		Yes		Yes		Yes		Yes	
MECHANICAL												
Operating temperature	-30 to +85° C		-30 to +85° C		-30 to +85° C		-30 to +85° C		-40 to +85° C		-40 to +85° C	
Machine mountable	Yes		Yes		Yes		Yes		Yes		Yes	
Mounting holes	Yes		Yes		Yes		Yes		Yes		Yes	
Dimensions (mm)	16x36x3		16x36x3		16x36x3		23x36x4		15x22x3		15x22x3 / 16x36x5	





UART Serial Port  
Module OWS451



SPI Module  
OWL221a



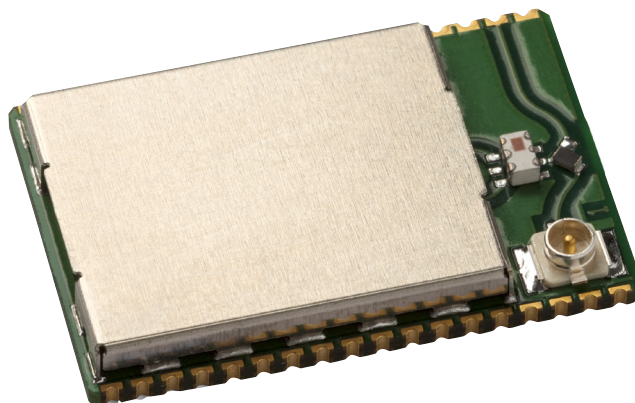
SDIO Module  
OWL222a



SPI Module  
OWL253

	UART Serial Port Module OWS451		SPI Module OWL221a		SDIO Module OWL222a		SPI Module OWL253	
WIRELESS STANDARD	Wireless LAN (WLAN)		Wireless LAN (WLAN)		Wireless LAN (WLAN)		Wireless LAN (WLAN)	
STANDARD SPECIFICATION								
Bluetooth qualification	-		-		-		-	
Bluetooth profiles <sup>Note 4</sup>	-		-		-		-	
Wireless LAN version	802.11 a, b, g, n (dual band, 65 Mbit/s)		802.11 a, b, g, n (dual band, 65 Mbit/s)		802.11 a, b, g, n (dual band, 65 Mbit/s)		802.11 a, b, g, n (dual band, 65 Mbit/s)	
RADIO								
Antenna type	Int.	Ext. <sup>Note 1</sup>	Int.	Ext. <sup>Note 1</sup>	Int.	Ext. <sup>Note 1</sup>	Int.	Ext. <sup>Note 1</sup>
Max output power incl. antenna	20 dBm	20 dBm	20 dBm	20 dBm	20 dBm	20 dBm	20 dBm	20 dBm
Range	400 m	400 m	400 m	400 m	400 m	400 m	400 m	400 m
2.4 GHz channels	1-13		1-13		1-13		1-13	
5 GHz channels	36-165 (U-NII Band 1, 2, 2e, 3)		36-165 (U-NII Band 1, 2, 2e, 3)		36-165 (U-NII Band 1, 2, 2e, 3)		36-165 (U-NII Band 1, 2, 2e, 3)	
TYPE APPROVALS								
US (FCC)	Yes		Yes		Yes		Yes	
Europe (ETSI R&TTE)	Yes		Yes		Yes		Yes	
Canada (IC RSS)	Yes		Yes		Yes		Yes	
Japan (MIC - formerly TELEC)	Yes (2.4 GHz only)		Yes (2.4 GHz only)		Yes (2.4 GHz only)		Yes (2.4 GHz only)	
INTERFACE								
UART Logic-level	Yes		-		-		-	
RS232	Option <sup>Note 3</sup>		-		-		-	
RS422/485	Option <sup>Note 3</sup>		-		-		-	
Max baudrate	1.5 M		-		-		-	
Flow control on/off	Yes		-		-		-	
SPI	-		Max 75 MHz		-		Max 75 MHz	
SDIO	-		-		Max 50 MHz		-	
I/O pins	-		-		-		-	
FEATURES								
Throughput	500 kbps		20 Mbps		25 Mbps		20 Mbps	
AT command support	Yes		-		-		-	
Max number of slaves	7		-		-		-	
Extended Data Mode protocol	-		-		-		-	
Security	WPA2, Enterprise, EAP-TLS		WPA2, Enterprise, EAP-TLS*		WPA2, Enterprise, EAP-TLS*		WPA2, Enterprise, EAP-TLS*	
Quality of Service (QoS)	Yes		Yes		Yes		Yes	
Customer application platform	-		-		-		-	
Android support	Yes		Yes		Yes		Yes	
iPhone/iPad support	Yes		Yes		Yes		Yes	
Additional features	Embedded TCP/IP stack DHCP server/client DNS resolver		Infrastructure Ad-hoc  Driver support: Linux WinCE Embedded systems		Infrastructure Ad-hoc  Driver support: Linux WinCE Embedded systems		Infrastructure Ad-hoc  Driver support: Linux WinCE Embedded systems	
POWER								
Power supply voltage	3.3 - 5.5 VDC		3.3 - 5.5 VDC		3.1 - 3.6 VDC		3.3 - 5.5 VDC	
Current cons. (min)	7 mA @3.3V		5 mA @3.3V		5 mA @3.1V		11 mA @3.3V	
Current cons. (average Tx)	180 mA @3.3V		150 mA @3.3V		150 mA @3.1V		230 mA @3.3V	
CONNECTORS								
Board-to-board	Yes		Yes		Yes		Yes	
20 pin header	-		Option		Option		-	
JST (6-pol)	Option		-		-		-	
Solder pads	Yes		-		-		Yes	
MECHANICAL								
Operating temperature	-40 to +85° C		-30 to +85° C		-30 to +85° C		-40 to +85° C	
Machine mountable	Yes		-		-		-	
Mounting holes	Yes		Yes		Yes		Yes	
Dimensions (mm)	23x36x3		23x36x3		23x36x3		23x36x3	

# Multiradio Module



## Product Brief Multiradio Module OWL355

The Multiradio Module OWL355 is ready-to-embed in Internet-of-Things (IoT), industrial, medical and other demanding applications. The OWL355 module offers multiradio capability across Classic Bluetooth, Bluetooth low energy and WLAN with support for 2.4GHz and all 5GHz channels. The module has a small form factor and meets high production quality requirements according to IPC class standard. Together with the open source Linux host driver the module minimizes the work needed to implement wireless technology in a device as it provides hardware, modular radio type approval, EMC certification, Bluetooth qualification, a wide range of certified antennas and offers an extremely long life cycle.

### KEY FEATURES

- WLAN IEEE 802.11 a, b, g, n
- Bluetooth v2.1+EDR
- Bluetooth v4.0 (Bluetooth low energy)
- Dual-band radio, 2.4GHz & 5GHz
- Supports all 5GHz channels 36-165 (U-NII band 1, 2, 2e, 3)
- WLAN SDIO or SPI host interface
- Bluetooth UART host interface
- Open source Linux WLAN driver
- RF parameters & MAC address stored in EEPROM
- Modular radio type approvals for Europe, US and Canada (R&TTE, FCC, IC)
- High quality production according to IPC class standard
- Solder castellations for visual inspection
- U.fl. antenna connector with wide selection of certified antennas
- Industrial operating temperature range -40 to +85°C
- Supports security features WEP64, WEP128, WPA, WPA2, TKIP & AES hardware accelerator
- Ad-hoc, infrastructure and AP mode

## Technical Data – Multiradio Module OWL355

### WIRELESS STANDARD

Wireless LAN (WLAN)  
Classic Bluetooth  
Bluetooth low energy (Smart Ready)

### STANDARD SPECIFICATION

Wireless LAN IEEE 802.11 a, b, g, single-stream n (65 Mbps)  
Wireless LAN IEEE 802.11 d, e, h, i, k, r, s  
Bluetooth 2.1+EDR (Classic Bluetooth) up to HCI layer  
Bluetooth v4.0 (Bluetooth low energy) up to HCI layer

### RADIO

WLAN 2.4 GHz channels: 1-13  
WLAN 5 GHz channels: 36-165 (U-NII Band 1, 2, 2e, 3)  
Bluetooth EDR 2 Mbps and 3 Mbps rates

### TYPE APPROVALS

Europe (ETSI R&TTE)  
US (FCC/CFR 47 part 15 unlicensed modular transmitter approval)  
Canada (RSS IC)

### INTERFACE

WLAN: SDIO or SPI  
Bluetooth: UART  
RF parameters and MAC address: I<sup>2</sup>C

### FEATURES

RF parameters in on-board EEPROM  
MAC address in on-board EEPROM

Security:

- WEP64/128
- WPA-EAP-TLS, WPA-PSK
- WPA2-EAP-TLS, WPA2-PSK
- TKIP and AES hardware accelerator

Operational modes:

- Infrastructure (BSS)
- Ad-hoc (IBSS)
- Software AP

Driver support:

- Open-source Linux driver

Quality of Service 802.11e

Advanced power management

Link adaptation

Internal support for WLAN and Bluetooth co-existence

### POWER

RF supply voltage: 3.1 - 3.5 VDC  
IO supply voltage: 1.7 - 1.9 VDC

### CONNECTORS

Solder edge pads with castellations (visually inspectable)  
U.fl. antenna connector

### MECHANICAL

Operating temperature: -40°C to +85°C  
Dimensions: 22.3x14.8x2.88 mm  
High quality production according to IPC class standard

### CERTIFICATIONS AND COMPLIANCE

**R&TTE Directive 1999/5/EC:**

- EN 300 328, EN 301 893
- EMC: EN 301 489-1, EN 301 489-17, EN 61000-6-2
- Safety Compliance: 2006/95/EC, IEC 60950-1, EN 60950-1

**Medical Electrical Equipment:**

- IEC 60601-1-2

### ARTICLE NUMBERS

For article number descriptions, please see  
[www.connectblue.com](http://www.connectblue.com)



**connectBlue®**

*The strongest connection in a **wireless** world*








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## Get started smoothly

Acquire valuable understanding of the wireless module's functionality, configuration options, performance etc.

	 SPA Accessory Kit USB	 SPA Accessory Kit RS232	 Bluetooth SPA Starter Kit USB OBS419	 Bluetooth SPA Starter Kit RS232 OBS419	 iOS Bluetooth SPA Starter Kit OBS424*	 Bluetooth SPA Starter Kit USB OBS421	 Bluetooth SPA Starter Kit RS232 OBS421
<b>WIRELESS STANDARD</b>	-	-	Classic Bluetooth technology	Classic Bluetooth technology	Classic Bluetooth & Bluetooth low energy	Classic Bluetooth & Bluetooth low energy	Classic Bluetooth & Bluetooth low energy
<b>CONTENTS</b>	-	-	OBS419i	OBS419i	OBS424i*	OBS421i	OBS421i
<b>Wireless module</b>	-	-	USB adapter	RS232 adapter	USB adapter	USB adapter	RS232 adapter
<b>Adapter board</b>	USB extension cable, documentation and configuration tools	9-pin serial cable, USB Power cable, documentation and configuration tools	USB extension cable, JST cable, documentation and configuration tools	9-pin serial cable, USB Power cable, JST cable, documentation and configuration tools	USB extension cable, JST cable, documentation and configuration tools	USB extension cable, documentation and configuration tools	9-pin serial cable, USB Power cable, documentation and configuration tools
<b>Others</b>							
<b>COMPATIBLE MODULES</b>	OBS418 OBS419 OBS421 OBS424 OLS426 OWS451	OBS418 OBS419 OBS421 OBS424 OLS426	OBS418 OBS419 (included) OBS421 OBS424	OBS418 OBS419 (included) OBS421 OBS424	OBS424* (included)	OBS421 (included) OBS424	OBS421 (included) OBS424
<b>ORDER NUMBER</b>	cB-ACC-41	cB-ACC-26	cB-OBS419i-06-B	cB-OBS419i-06-A	cB-OBS424i-06-B	cB-OBS421i-16-B	cB-OBS421i-16-A

	 Bluetooth SPA Starter Kit USB OLS426	 Bluetooth SPA Starter Kit RS232 OLS426	 Bluetooth Low Energy Platform Starter Kit OLP425	 WLAN SPA Starter Kit USB OWS451	 WLAN SPI / SDIO Evaluation system
<b>WIRELESS STANDARD</b>	Bluetooth low energy technology	Bluetooth low energy technology	Bluetooth low energy technology	Wireless LAN (WLAN)	Wireless LAN (WLAN)
<b>CONTENTS</b>	OLS426	OLS426	OLP425	OWS451i	OWL253i / 222ai
<b>Wireless module</b>	OLS426	OLS426	OLP425	OWS451i	OWL253i / 222ai
<b>Adapter board</b>	USB adapter	RS232 adapter	CC Debugger adapter	USB adapter	Keith&Koep µConXS
<b>Others</b>	USB extension cable, documentation and configuration tools	9-pin serial cable, USB Power cable, documentation and configuration tools	JST/JST crossover cable, documentation	USB extension cable, documentation and configuration tools	Trizeps IV board, µConXS adapter, SDIO adapter, Linux drivers in binary code
<b>COMPATIBLE MODULES</b>	OBS421 OLS426 (included)	OBS421 OLS426 (included)	OLP425 <sup>5</sup> (included)	OWS451 (included)	OWL221 OWL222 (included) OWL253 (included)
<b>ORDER NUMBER</b>	cB-OLS426i-04-B	cB-OLS426i-04-A	cB-OLP425i-26-A	cB-OWS451i-04-B	cB-WDK-04-A

### Explanations on Table Notes

- 1 Diversity supported
- 2 Approximate maximum range
- 3 Via external transceiver
- 4 Special licensing & production requirements applies for the Classic Bluetooth products
- 5 JST connector required

\* In progress

## Your business. Our total wireless expertise. One wireless product.

This is what we do. We provide a safe step into the wireless future.

**Imagine equipment that is in constant rapid motion at -30° C; it is monitored, maintained, updated and operated wirelessly from a distance, massively increasing up-time and personal safety. Or, imagine a sensitive gene duplication sequence where the whole gene process is performed in a 100% sterile environment due to high-speed reliable wireless solutions. This is the essence of connectBlue - wireless solutions based on tough industrial and medical demands on robustness, lead-times and performance.**

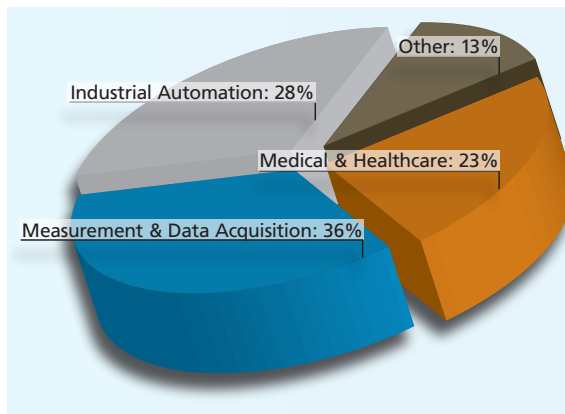
Together with our clients, we create solutions that improve, not only production economy and safety, sometimes we help push the limits of science as well. And all this using a seamless nerve-system that cuts through walls, floors and ceilings.

Working with connectBlue isn't just about buying a wireless product. It's combining forces to find the best wireless solution. The mix of combined expertise is filtered through a toolbox of software, hardware and industry-specific specialists and poured into a wireless product that is provoked, tested, stressed, certified, and then tested over and over again.

connectBlue was founded in 2000. From years of experience within industries with tough demands, connectBlue focused on a few key requirements: compatibility, extended life cycles and performance. Still today, these requirements are the focus of the connectBlue delivery.

Today, we employ 35 experts where 20+ are wireless engineers with deep know-how from key segments. Our head office lies in Sweden and our top-notch external production facilities are also in Sweden. We have local sales and support from the offices in Germany and the USA. And, on top of that, connectBlue has distributors in 50+ countries.

Working at connectBlue means working with some of the world's most demanding



### WIRELESS SEGMENTS

connectBlue is a leading wireless provider for demanding applications in the segments industrial automation, medical & healthcare, measurement & data acquisition, diagnostics, infrastructure, professional vehicles and point of sales.

brands and industries (look at our list of clients). They in themselves represent the highest standard of innovation in their industry segments. This is why we have to excel at what we do. We employ and develop staff with great experience from tough demands on lead-times, performance and technical documentation as well as young and innovative brains that can define the future of wireless technology.

**Together we solve issues of today using the technology of tomorrow.**



# Wireless is not a technology. It's a commitment.

We have been in wireless since back in 2000 when we launched the world's first wireless serial port adapter. Based on Classic Bluetooth technology, Bluetooth low energy technology, Wireless LAN (WLAN) and IEEE 802.15.4 / ZigBee, we provide ready-to-use products and modules as well as custom design solutions.

Our head office lies in the wireless epicenter of Southern Sweden. There, we also utilize the resources from external, high quality manufacturing facilities where each product is individually tested and tuned for consistent performance. We have local German and US sales offices and first-line support backed by the European technical team allowing for a virtually 24 hour coverage.

For more than a decade, we have helped some of the world's most demanding brands to exploit new possibilities of wireless technologies. Our wireless solutions are designed and tested for the most demanding applications and environments in industrial automation, medical & healthcare, measurement & data acquisition, professional vehicles, and point of sales.

**Our product strategy is simple.**  
**State-of-the-art solutions. Nothing less.**

*connectBlue®*  
*The strongest connection in a wireless world*



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