

Libre sensor with Bubble, MiaoMiao & BluCon

**Find out how to
convert to CGM**

LIBRE LIFE AUTUMN 2020 ISSUE

Welcome

This is our autumn issue of our online magazine written especially for Libre sensor wearers and as promised we'll be covering CGM transmitters associated with wearing a Libre sensor.

While the Libre is certainly a game-changer, there are some users who find it's use restricted and that it fails to address key areas that would help to manage their control.

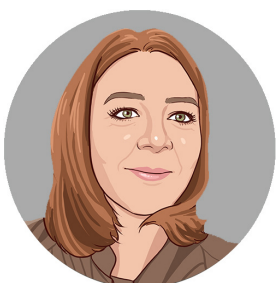
We discuss some of these and explain how you can convert your Libre, a flash glucose monitor, into a continuous glucose monitor, usually abbreviated to CGM.

We compare the three transmitters available to users in the UK that enable users to see real-time readings of their glucose levels which are updated every 5 minutes, rather than when scanning the Libre device. We provide a full table for easy comparison of the devices on page 6. Remember that none of these are approved by Abbott or regulated by the UK regulatory body, so if you do choose to use a transmitter then the risk is your own.

As the transmitters are only part of the system, this issue also gives a brief overview of some of the Apps available to use and which may help you to determine which transmitter is suitable for you.

I am fortunate to have tested all 3 of the transmitters discussed and although, as is quite usual, there are pluses and minuses to each. However, I have made a choice on which I would recommend and you can read my analysis and explanation on page 9.

Thanks for reading and best wishes,



Samantha x

PS. Our Winter issue will take a fresh look at the Libre sensor covering topics relevant to new Libre users but also those with some insights already. We hope to provide you with inspiration for the New Year and your life with a Libre! Keep an eye out or subscribe (details on page 8) to ensure you receive your copy in January. See you in the New Year!

Disclaimer

Love My Libre is not associated or affiliated with Abbott or FreeStyle Libre. Content here and on our website www.lovemylibre.com does not constitute medical advice, or replace the relationship between you and healthcare professionals nor the advice you receive from them.

WHAT IS A CGM?

CGM is the acronym for continuous glucose monitor and there are 3 elements to a CGM device. Firstly, there's the sensor that contains a filament that sits beneath the skin and measures interstitial fluid; secondly there's a transmitter that picks up the data using NFC (near field communication); and then a reader that receives the data from the transmitter, interprets it and displays the glucose level readings on the reader. This can also be a phone that is capable of receiving data by NFC.

To use a CGM effectively the user also needs access to an App that displays the readings, usually as a log and also as a graph. The App enables users to download other charts and reports that will provide data showing results, patterns and trends relating to the user's glucose levels over time.

A CGM will send glucose level readings every 5 minutes to the reader or phone continuously i.e. ongoing through the day and night. Data is translated by a proprietary algorithm (software owned by the developer of the App) and displayed on the user's device. The CGM has the capability to alert a user to high and low levels through an alarm.

Remember

The Libre sensor is not waterproof, but water-resistant to the IP67 standard. The two things are not the same.

The sensor has been tested to withstand being immersed in water under defined conditions of pressure and time i.e. to a depth of 1m for a period of 30 minutes. That does not mean that a sensor is suitable for wearing in a swimming pool or the sea although the manufacturer's guidance states that it can be worn whilst showering.

Although a Libre sensor does not require calibration, a CGM may need the user to calibrate it, by carrying out a finger prick test, to ensure the levels it gives are 'accurate'.

Accuracy

No sensor is 100% accurate all the time and neither are readers or finger pricks, although finger pricks are often held up as being the standard that many users measure the 'accuracy' of their sensor.

Abbott (the manufacturer of the Libre sensor, have carried out and validated many medically compliant tests to establish a MARD (average glucose variance) of 9.3% across 14 days wear of the sensor. There are no such tests carried out on 3rd party transmitters and the related Apps and therefore 'accuracy' is largely based on individual reporting.

FREESTYLE LIBRE AS A CGM

The Libre is often referred to as a CGM but is in fact a flash glucose monitoring system as it relies on the user to scan the sensor to receive the readings stored in the sensor.

Although the Libre brings huge benefits to wearers, there are principally 3 features 'missing' when using the sensor.

- 1** Continuity of seeing readings - without the need to scan!
- 2** Alarms - crucial to many wearers and their carers to alert them to highs and lows;
- 3** Ability to share information with another person / carer.

These are the main advantages offered when converting the Libre to a full CGM but are not the only features sought. Many wearers convert so that they can see their numbers without having to scan their device, and to see them on a smart watch. Other adaptations I've heard of include connecting up to an Alexa or Google to be able to ask about glucose levels and displaying the readings from the sensor on a car's instrument panel.

CONVERTING TO A CGM

In order to be able to convert the Libre to a full CGM you will need a transmitter that can read the Libre sensor using Bluetooth. It's important to note here that although widely done by many Libre wearers and known and even accepted by many health professionals too, the use of transmitters and the associated Apps are not medically approved and would breach the manufacturer's warranty. None of these products referred to below are recommended by Freestyle Libre and are untested by Abbott.

WHAT ARE THE OPTIONS?



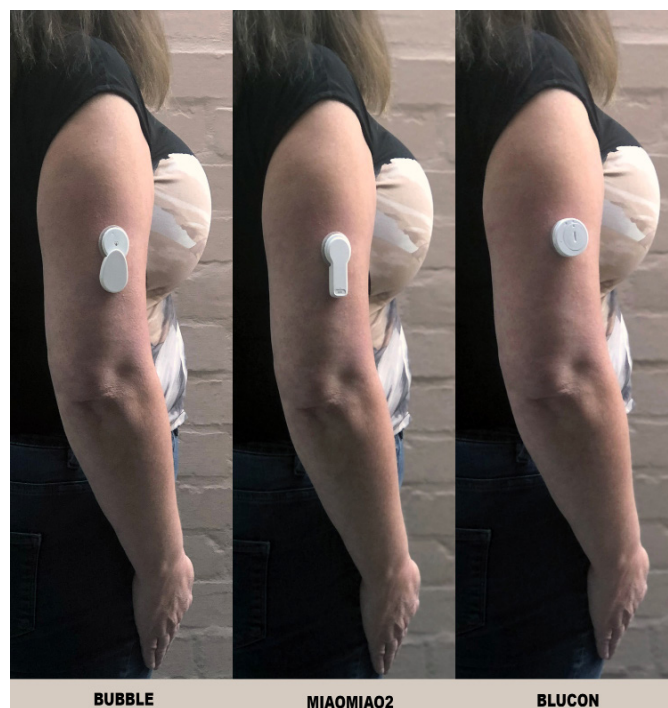
For the Freestyle Libre, there are currently 3 main options – transmitters - that can be used to convert your Libre into a true CGM: the MiaoMiao, Bubble and BluCon Nightrider. In terms of manufacture, both the MiaoMiao and Bubble are manufactured in China, so use Chinese technology. The BluCon NightRider is manufactured in the USA.

Note

Although there are 2 products produced by MiaoMiao (1 and 2), we have not considered the MiaoMiao 1 here, nor differentiated between the NightRider BluCon waterproof and non-waterproof products. There are also many other medical companies looking to enter the CGM market in the near future.

Each of these 3rd party transmitters has a different form and attaches to the Libre sensor in a different way. Evaluating how you will wear the transmitter is an important consideration as well as the App that you will use that will provide the data and alarms.

Wearing a transmitter changes the overall look of the sensor on your arm (or other site) and here I've modelled how each device looks.



3RD PARTY APPS

Once you have a transmitter device, or preferably before making your decision on which to choose, you should consider the Apps available. All transmitters have their own apps but these Apps are not interchangeable so it's advisable to check which app you will use in advance of buying the device.

For MiaoMiao the manufacturer's app is called Tomato and is available to download on both the Google Play store and Apple's App store.

Bubblan (a seller of Bubble) have an app called Diabox which is on Google Play for android phones, and for access through an iphone you need to download and accept the terms of TestFlight using the app in beta format.

Ambrosia Systems recommends its App, Link BluCon for readings from the BluCon Nightrider. The app is available on both Google Play store and Apple's App store.

It's also a timely point here to mention that you do need to be a little technical-minded to install some of the 3rd party apps mentioned below.

Third party apps you may see mentioned include Xdrip (different versions available for Android and IOS), Spike, Glimp and Nightscout.

HOW TO CHOOSE A TRANSMITTER FOR THE LIBRE

1. If you already have a smartwatch, check which Apps will be compatible with the watch. This may narrow down the choice of transmitter device.
2. Consider the form/shape of the device and how this will look on your arm or other site.
 - How does the device attach to the Libre?
 - How will the device be attached to you? Particularly important if you have any allergies.
 - Will you wear an armband or use another method of adhesion (if required)?
3. Assess the features of the transmitters based on compatibility for your watch if you have this already. See our table on pages 6 and 7 to help you prioritise which features are key.
 - Consider alarms, ability to share information with carers etc.

IS LIBRE 2 A FULL CGM?

There's much anticipation in the online T1 community for the Libre 2 and its now available in some European countries and the USA, although the App is at the time of writing, waiting for FDA approval so data is only to a reader device.

Libre 2 is now in the process of being rolled out in the UK although the reader won't be available until January 2021. Libre 2 should automatically replace Libre 1 on NHS prescriptions.

The main difference with the Libre 2 is that it will have alarms to alert users to high and low glucose levels. The alarms will work independently of scanning the device, although users still need to scan to receive regular updates to glucose levels and all related data.

DO I NEED TO KEEP SCANNING?

Even if you convert your Libre to CGM, you will still probably need to scan your sensor regularly to ensure your healthcare professional can see your glucose levels and access reports from your data.

Sometimes providing this data is part of the contract with the NHS for funding and it also helps the NHS to collate data which is used to evaluate the effectiveness of prescribing the sensor as a treatment and to assess ongoing funding and budgets.

WHICH WATCH?

There's no definitive guide for which watches are compatible with any of the transmitters and there are many options. In general, any watch with WearOS and Apple watchOS should work with sending readings from a Libre sensor, but it does still require the smartphone used for scans to be near by.

Stand-alone, where the watch collects data separately, is currently only an option using a BluCon NightRider or through the use of a Watlaa watch. MiaoMiao have recently launched their own Ticwatch which uses the Tomato App and can give readings without a phone (chinese language). Note, Libre 2 isn't compatible with all options.

CALIBRATION

Using a CGM device and third party app ie. not LibreView, for glucose readings will usually require the user to calibrate their readings and the user will need to finger-prick to give a reading, up to once or twice each day.

CGM users often suggest that this gives a more accurate reading although the need to finger-prick does negate the point of the Libre to eliminate or reduce finger-prick testing and the assumption here is that 3rd party data, which is untested and unauthorised by Abbott and the regulatory authorities is more reliable than the manufacturer (Abbott).

COMPARING TRANSMITTERS: MIAOMIAO, BUBBLE AND BLUCON

MIAOMIAO 2

www.miaomiao.cool or www.mypump.co.uk - UK



MiaoMiao2 X 1
 Charge cable X 1
 Adhesive stickers (10 sheets of 8)
 Armband holder (UK site)

Slim design, fully covers sensor to ensure connectivity

Matt off-white colour. Sealed unit. Waterproof standard IP67

Requires tape/armband to hold in place

Uses stickers for adhesion between sensor and device - limited number included - ongoing cost

Charges via USB cable, can be worn while charging

Reset using pin on front of transmitter

Uses Tomato app - available on Google Play & Apple App Store *

Instructions can be downloaded by scanning QR code

UK distributor - delivery within 48 hours or shipped from China (manufacturer)

Customer service often reported as poor. Best means of contact via Facebook Messenger

\$169 USD from China, £159.99 Mypump (UK, inc delivery) delivery +adult +child holders)

Most popular transmitter brand

12 months warranty & 30 day 100% guarantee

Terms & conditions - legally compliant

Privacy Policy is legally compliant/GDPR compatible

Prices correct at time of publication.

BUBBLE

www.bubblan.org



Bubble transmitter x 1
 USB charging cable x 1
 Stickers for attaching to sensor
 Stickers for attaching to arm

Slim egg-shaped/droplet design, only partially covers sensor - reduced area of connectivity

Matt off-white colour plastic. Sealed unit. Waterproof standard IP67

Requires tape/armband to hold in place

Uses stickers for direct adhesion to arm and between sensor and device - ongoing cost

Charges via magnetic connection to USB cable and needs to be removed from arm to charge

Uses magnet in storage box for reset

Bubblan's developer's app - Diabox on Google Play or via Testflight for iOS (using developer's license)*

No Instructions with device - need to refer to website "Getting Started"

Ships from Sweden with delivery dependant on stock, as product is manufactured in China

Good, responsive customer service via Facebook Group.

139.99 Euros + shipping (from distributor in Sweden)

Increasingly popular choice in UK

1 year limited warranty - NO details of manufacturer in case of claims

Terms & conditions - NOT legally compliant (UK)

Privacy Policy is NOT legally compliant/GDPR compatible

APPEARANCE AND USE

SERVICE

MARKET

LEGAL

BLUCON (WATER-PROOF)

www.ambrosiasys.com



NightRider BluCon x 1
Replacement battery cover
Armband
Power Pin

Sits on top of sensor thus fully covering the sensor to ensure connectivity

Shiny white moulded plastic - not sealed. Waterproof version requires sticker overlay (replace every time battery is changed)

Armband optional

No skin contact with transmitter

Uses battery only (CR2032), no option to charge - ongoing battery costs

Reset using pin on front of transmitter

Manufacturer's app - LinkBluCon available on Google Play & Apple App Store *

Quick Reference Guide and Battery Replacement instructions provided. Also on website.

Manufactured and shipped from USA

Generally poor customer service. Use contact form on website or register an account as an affiliate.

\$145 USD water-proof (approximately £130) or \$110 USD non-waterproof

Generally focused on USA market

12 months limited warranty. Buyer pays returns shipping. Returns only before shipping or Buyer pays returns shipping...

Terms & conditions compliant with UK law (US jurisdiction)

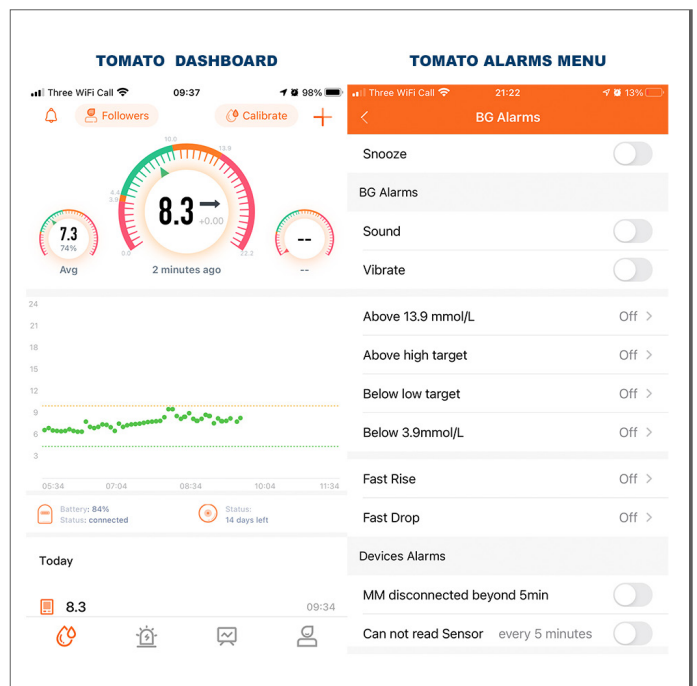
Privacy Policy is legally compliant USA/GDPR compatible

THE APPS

A very cursory overview of the Apps for use with a 3rd party transmitter is given below and on the following page.

I have not included the Nightscout app which described as an open source DIY project that allows real-time access to CGM data via a personal website. See www.nightscout.info

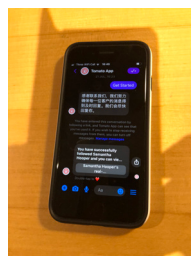
TOMATO FOR MM2



Tomato is the most commonly used app and market leader for 3rd party CGMs. It is available on both the App store (Apple phones) and Play store (Android phones).

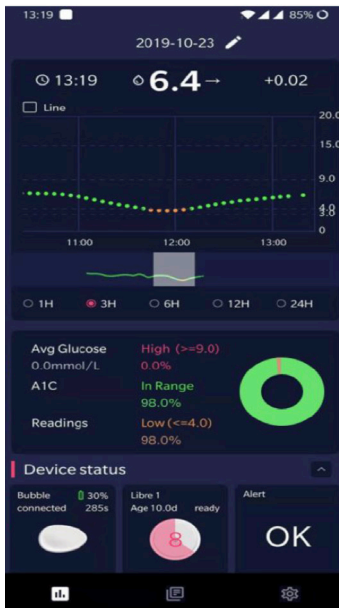
It offers alarms and can be calibrated for individual use. Readings continue after a sensor ends for around 12 hours.

Basic reporting information is free, however more insights are included in a premium version currently available at \$4.99 per month.



Caregivers and others can receive readings from Tomato via Facebook Messenger.

DIABOX FOR BUBBLE

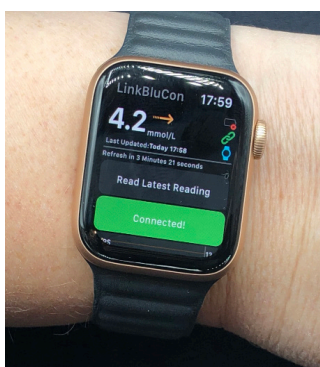


Diabox offers alarms and calibration has recently been added. Reporting information is free.

Diabox has recently seen increased interest in its App as it's developers are regularly in touch with users within their Facebook Group and seem to be actively addressing issues as they arise.

Although available on the Play store (Android phones) it is not an approved Apple App. Access is via TestFlight which is intended for developers to run beta tests. It's not clear if Diabox will become a fully verified App, passing stringent standards and checks by Apple to protect consumers.

LINKBLUCON

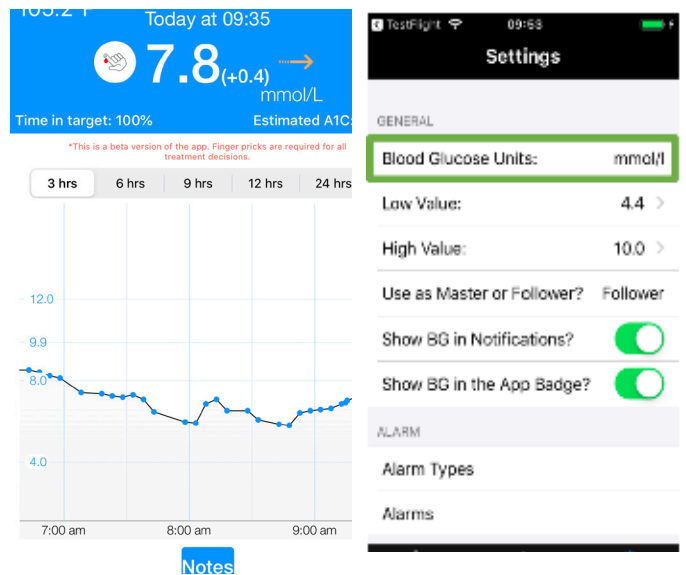


LinkBluCon is available on both Google Play store and Apple's App store. Requires initial registration. Easy to switch from reading levels on phone to Apple watch (standalone).

GLIMP (FOR ANDROID)

Glimp is an App for Android phones available on the Play store. It's not yet compatible with Libre 2 or Libre US - requires NFC connectivity. App has alarms and can be calibrated.

XDRIP4IOS



Uses TestFlight as beta version, not an officially recognised App by Apple. Download once invited by developer account (details on Facebook). Users need to install updates at least every 90 days for compliance with test status.

XDRIP+ (ANDROID)

xDrip+ for android is a separate open source app that acts as an artificial pancreas system. See <https://androidaps.readthedocs.io/en/latest/EN/index.html>. Not on the Play store.

SPIKE (FOR IOS)



Designed for use with iOS. Not compatible with android.

Not an official App in App store - defined as research tool. Requires developer account and some technical ability. See instructions at <https://spike-app.com/#installation> and read the FAQs.

MAKING A RECOMMENDATION

Anticipating the question “which one would you recommend?” I’ll attempt to give an objective opinion on the options available in the UK. I’m fortunate enough to have independently purchased and trialled all 3 of these transmitters so have no affiliation to recommending any one in particular.

A key finding from my experience is that there’s too much emphasis on the transmitter chosen, whether it’s MiaoMiao, Bubble or BluCon – and the main consideration should actually be which app will you want to use on a day-to-day basis? My suggestion would firstly be to look at and research these first. Buying a MiaoMiao, Bubble or BluCon doesn’t necessarily determine the app you use unless you choose one of these manufacturers’ own apps. Otherwise, there is xDrip4iOS or Spike that work on iPhones and xDrip+ and Glimp for Android devices.

You will also need to consider the compatibility of the operating system you are using on your phone and what type and model of phone the app will run on. With the Libre 2 about to rollout out too, there’s the added complication of ensuring that this will work with the phone and transmitter combination that you propose to use. Don’t make the assumption that all smartphones will be compatible!

A recent issue that may become more common is that phones such as the latest Huawei models don’t have access to the Google app store so effectively cannot work with 3rd party transmitters. Resolution of the issue largely depends on US politics which currently bans US companies from working with those deemed to be a ‘national security risk’.

In the course of testing the transmitters and apps, I was unfortunate to experience a reaction to the adhesive used on the Bubble stickers, having no previous reactions to any other products or the Libre. In terms of skin contact, my recommendation for the best transmitter that avoids increased skin contact is the BluCon.

Primarily aimed at the American market, I found the main negative with the BluCon being that it required a battery change every time I changed the sensor but having bought better quality, longer lasting batteries was something I was willing to accept for the convenience of getting my readings directly on my Apple watch - a benefit not possible with other transmitters unless the phone is nearby (within approximately 10m). And the initial assumption that the BluCon would be too prominent and stick out on my arm proved unwarranted.



Unlike Youtubers posting reviews, or giveaways, I’m not going to sit on the fence and my overall recommendation for use of a transmitter is the **MM2 with Tomato**, particularly if you’re a beginner with the sensor and not too tech-minded. I haven’t had any issues with their customer service (which often crops up as an issue propelled by Bubble users) and am happy to charge it whilst wearing, if need be. It’s fairly easy to set-up and get going and Tomato provided good connectivity with all the data I felt I needed.

I found the Bubble shape rather strange when physically worn (on the arm) and the fact that it’s only a beta test on iPhone concerns me greatly as well as their Ts and Cs and Privacy Policy being incompatible with both UK and EU data protection and consumer laws.

Why would Apple users, paying a premium for Apple products, ignore the verification that ensures Apps meet the highest standards and increasingly look to protect our privacy?

With Libre 2 & 3 on the horizon, the longevity of 3rd party transmitters is unclear. My advice is that it may be better to buy sooner rather than later.

LOVE MY LIBRE



Thank you for reading this Issue of Libre Life presented by Love My Libre Ltd. We are a small family business, born from an idea by my 12-year-old son who wanted to make his mum's sensor look less like a medical device.

It was designed to be worn on the upper arm in a similar way to runners wear their phone so needed to be light weight, robust and suitable for wearing in all weathers. Comfort was also a key factor as was being able to put it on easily.

In partnership with Warwick Manufacturing Group, the armband has been further developed and tested before being brought to market.

OUR PRODUCTS

"The armband is amazing, my son plays contact rugby, spars in boxing, and plays football. The armband has protected his sensor and then some."

Our Librebands are especially for wearing over a FreeStyle Libre and are suitable for sports, exercising, swimming and everyday wear. The current range of designs available:



SUBSCRIPTION OFFER

For more information about us, other designs and new products please visit our website and subscribe to receive a copy of our **Libre Life Newsletter**.

For new subscribers who haven't yet tried a Libreband we offer a 10% discount for purchases from our website, enter SUBSCRIBE10 at checkout*.

**Applies to email subscribers only.*

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