Mahlkönig

Grind-by-Sync FAQs

/ /   Frequently Asked Questions

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Customer Support

1.1 Who do I contact if I have issues with the GbS grinder

For issues related to the GbS grinder including issues connecting to your Wifi please contact **sync@mahlkoenig.com**

1.2 Who do I contact if I have issues with the La Marzocco Machine

For connectivity issues related to the coffee machine including connecting the coffee machine to your WiFi please contact support-iot@lamarzocco.com.

1.3 Who do I contact if I cannot sync the GbS grinder and La Marzocco coffee machine?

For issues related to Syncing between GbS grinder and coffee machine please contact support-iot@lamarzocco.com.

Please note that the Sync function is not yet enabled in the La Marzocco Pro mobile app and will be coming soon.

1.4 What is The Sync System, Mahlkönig Sync, and Grind-by-Sync?

Grind-by-Sync is the ability of our grinder to adjust itself based on a connected coffee machine which shares brewing parameters after every shot.

Mahlkönig Sync is the means used to connect and monitor the Grind-by-Sync grinder and synced parameters. This includes the back-end Mahlkönig Sync Cloud, and the front end (Mahlkönig Sync mobile and Mahlkönig Sync desktop) applications.

Sync systems is the entire ecosystem of Grind-by-Sync grinder, the Mahlkönig Sync Apps, Mahlkönig Sync Cloud, as well as our partnership with La Marzocco.

Grind-by-Sync (GbS)

2.1 GbS grinders work with which machines?

Currently, with commercial La Marzocco machines that have ABR or AV functionality.

2.2 Will GbS be able to Sync to other coffee machines?

The GbS grinder is designed with the ability to Sync to virtually any coffee machine as long as the coffee machine manufacturer enables communication. If the machine sends data, then GbS can connect.
We intend to expand this to willing partners and will inform the market as and when new partners come on board.

2.3 How does the GbS connect to coffee machines?

Depending on the coffee machine capabilities, the GbS grinder can connect via cloud, via wifi, or direct cable.
Cloud simply means that the data from the grinder and the machine is sent via a cloud server and exchanged in the same way. Wifi, means that the data is sent directly between the grinder and machine through Wifi (without the aid of a cloud server). Cabled means that the grinder and machine are directly connected via a cable.

In any of the above cases, the communication takes place in a matter of a few seconds.

2.4 Do I need a reliable WiFi?

Yes, for Grind-by-Sync to work properly and error-free a stable network is absolutely necessary. The grinder indicates the strength Wifi, and ideally all Wifi bars should be displayed for strong connection.

2.5 How can I sync the GbS grinders to the La Marzocco espresso machine?

The grinder and coffee machine are Synced using both the Mahlkönig Sync App as well as the La Marzocco Pro app.
We've provided a detailed step-by-step guide available directly within the Mahlkönig Sync Apps.

2.6 To onboard or sync the GbS do I need an account?

Yes, you first need to register under Mahlkönig Sync Applications to onboard grinders onto the cloud. This gives you
the ability to see telemetry data of the grinder(s) as well as the ability to Sync to the La Marzocco coffee machine.

In a company setup you need to ensure that you establish a hierarchy of company manager, regional manager,
store managers, and barista. Only the first three have the ability to onboard grinders. Please read further under
the section Mahlkönig Sync Applications where we explain about hierarchical settings.

2.7 I cannot see my local wifi in the grinder Wifi dialogue

The GbS will only handle 2.4Ghz as it transmit more data which is necessary for good communication between grinder
and machine. 5Ghz is not supported and will not be detected/listed by the grinder.
Ensure that you have a 2.4Ghz network connection.

2.8 What are the Mahlkönig sync apps?

Mahlkönig Sync includes a suite of two applications. A Desktop and a Mobile application each of which with
their own key advantages.

2.9 Why would I use the Mahlkönig Sync Desktop App?

Typically, the Desktop Application is considered an Admin application which allows Company Managers,
Regional Managers, Store Managers, and Baristas to setup user profiles, hierarchies, view details and telemetry of their
devices, stores, regions and more. It designed to be viewed on a desktop application and gives
a more granular view of daily operations.

3.2 Why would I use the Mahlkönig Sync Desktop App?

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3.3 Why would I use the Mahlkönig Sync Mobile App?

The Mobile Application has very similar benefits to the Desktop App, but the smaller screen size is not as intuitive to view bigger amounts of data.

The key purposes of the mobile app is to onboard the grinder to the Mahlkönig Sync Cloud and to sync to coffee machine. It also gives you quick access to daily operations data for your company, region, or store at the palm of your hand.

3.4 How do I get myself registered to use the Mahlkönig Sync Apps?

There are two scenarios for registration.

In the first scenario, you are the first user of your company. You start the registration process (either in the Mobile App or the Desktop App) by clicking on "Not yet registered?" and entering your email address. You will receive an email with further instructions to set up your user account and your company. By following this process, you will automatically be the company manager of the company you have just set up.

In the second scenario, the company already exists with the first user(s) included. The existing users in the system can choose to invite further users to the company. The invited user will receive an email with a confirmation link to start the user registration. By completing the registration, the invited user is automatically part of the existing company.

3.5 What are the different roles within the Mahlkönig Sync Apps?

The Mahlkönig suite of applications is designed with companies as well as individual users in mind. The company hierarchy and respective roles within the system are as follows:

There are four different user groups in the system with cascading rights: Company Manager, Regional Manager, Store Manager, Barista.

The Company is the highest entity within the system which is managed by the Company Manager. The Company Manager can orchestrate the whole entity. He can set up "Regions" and "Stores" within his company and assign Regional Managers to Regions as well as Store Managers & Baristas to Stores. Every Region should contain at least one Store.

Regional Managers can set up Stores only within their Region and assign Store Managers and Baristas to these Stores.

Store Managers can assign Baristas to their Store(s). Every "Store" will be part of one "Region".

Baristas cannot add entities nor users.

Therefore when registering, first understand if you are a company manager, a regional manager, a store manager, or a barista. Once you identify your role, you need to approach the next person higher up in your organizational structure to ensure that they do the setup.

Recommendation: Company Manager(s) should create the company account and cascade the rights to the regional managers, and regional managers to the store managers, and finally store managers to the baristas.

3.6 Can a manager adjust both the dose and the grind from afar, via telemetry?

This is currently not enabled. However, the next version of the Mahlkönig Sync Desktop app will allow managers to define recipes and roll them out to store managers. The store manager is then in charge of rolling the recipes to the grinder(s), as the store manager is ultimately the responsible person for the daily operations within a store. In the recipe, managers will be able to define the brew time, disc distance, and target weight (for grinders with ground weight measuring capabilities).

3.7 Do I need the Mahlkönig Sync Mobile App and LM app for connecting to La Marzocco coffee machines?

Both the Mahlkönig Sync app and LM Pro app are required for the initial set-up of The Sync System, and the pairing process can be initiated from either app. If one app is not installed, then either apps will guide the user to install the missing app.

3.8 How do you handle data security and what do you do with my data?

Before signing to the usage of our apps we recommend that you review the Data Privacy Policy and Terms of Use listed during the registration process. This gives you a detailed description of how your data is handled. We take the strictest measures according to GDPR rules. Your data is only used by Hemro International AG to handle support requests. You can also opt-out at any point by deleting your account and by choosing to keep your grinders offline. The disadvantages of doing so is that GbS is not operable and the grinder will not be able to receive latest firmware updates.

3.9 Does the Mahlkönig Sync cloud have a backup system?

Yes, our cloud is equipped with robust backup systems to ensure data safety and integrity.
We regularly back up data to prevent data loss in case of unexpected events.

3.10 How long is the data stored for?

Your data is stored securely in our cloud for as long as your account remains active. If you choose to delete your account, we adhere to the Data Privacy Policy and promptly remove your personal data from our systems.

3.11 How are outages planned?

Outages are carefully scheduled during off-peak hours to minimize disruption. We notify users in advance via email or in-app notifications about any planned maintenance or updates.

3.12 Does Mahlkönig Sync operate in all countries?

During the onboarding process, in some countries with strict firewall policies, the Mobile App may timeout and end with an error or unsuccessful connection. However, to check if the onboarding process was actually successful, please log into the desktop application, go to the device tab, and verify if your grinder has been successfully onboarded by searching for the HMI SN or Grinder SN in the search field. If the onboarding was unsuccessful, it most likely means that the strict firewall policies did not allow the onboarding process.

3.13 How do I interpret the box diagram in the Dashboards?

By default we use scatter plots to display data over some time. However, scatter plots can become difficult to read when the amount of data to display is large In these cases, you will notice that some dashboard s will switch to a box diagram. A box diagram is a common approach for statistical data analysis and can be interpreted as follows.

The top and bottom whiskers represent outliers. For example, an extraction time was unexpectedly too long (max), or too short (min), perhaps due to an issue during the brewing process.

• Max (top whisker):

• Min (bottom whisker):

Most of the shots are expected to be within rectangular box, whereby

• Q3: is the top of the box

• Q2: Median

• Q1: bottom of the box
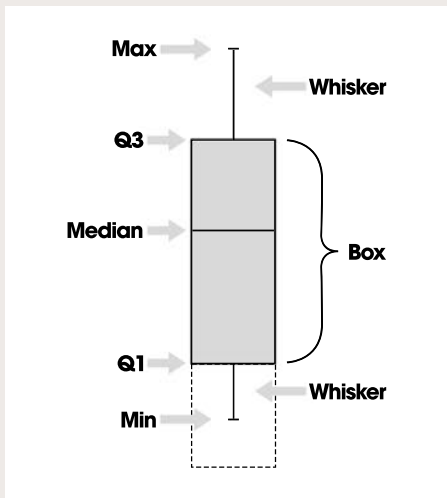
Grind-by-Sync Algorithm

4.1 What is the purpose of Grind-by-Sync?

The quality of a coffee beverage is subject to the variance of several parameters during the brewing process such as the roast of coffee beans used, equipment stability, and environmental conditions, like temperature and humidity. Grind-by-Sync (GbS) is an innovation brought to the Mahlkönig newest grinder family. GbS grinders adjust the grind size of the coffee to achieve the target brew time, which is set in the recipe. The grinder receives the brew time of the last coffee from the coffee machine. GbS is intended to keep the brew time within a tight range of its desired value considering all the system variances.

The system is most accurate with the grinders incorporating the load cell as this eliminates one major variant (the weight variance of the ground coffee).

4.2 How does the algorithm function in simple terms?

If the shot runs too fast, indicating a coarse grind, the algorithm within the grinder signals the electric motor to refine the disc distance which therefore adjusts the grind size. Contrarily, if the shot is too slow, indicating a fine grind, the grinder adjusts for a coarser grinding. The Grind-by-Sync uses the target extraction time of the machine to automatically adjust the disc distance on the grinder.

4.3 How do I set my initial Sync recipe?

The recipe targets are entirely set on the grinder by editing the recipe. The user can select different types of recipes including manual-based, time-based, or weight-based in the case of a grinder with weighing capabilities. The time-based and weight-based recipes have the capabilities to sync.

Within each recipe, the user can also define an initial dialed-in disc distance and the brew time. We recommend that you first manually dial in the grinder and coffee machine until all parameters are stable. After you dialed-in then you can enable grind by sync.

For more instructions on how to setup the grinder, please see our support videos as well as the User Software Manual.

4.4 What are the preconditions to use Grind-by-Sync?

Some preconditions have to be met to allow GbS to operate. These are:

- Grinder and coffee machine have to be connected (either via Hemro-cloud or via a direct wired connection, depending on the type of coffee machine used)
- Enable wifi and enable cloud on the grinder
- Enable machine to machine connection on the grinder
- For connections via the cloud the time on the grinder and of the coffee machine has to be set properly
- The recipe used has to be configured as a "synced" recipe
- A brew target time has to be set for this recipe
- GbS has to be enabled on the grinder

4.5 What are the best practices to make the best out of Grind-by-Sync?

GbS is a one-way communication protocol. The grinder tries to match brew events with former grind events.
The machine however does not match the grind events with brew events. Therefore the barista needs to be aware of what they are doing. The following are the recommended best practices to ensure that the GbS is working at its best.

- Set a recipe on the grinder by setting the target weight if it is a GbS with load cell model and target time if it is a GbS without load cell
- For the selected recipe dial-in the recipe between grinder and machine i.e. adjust the grind setting until the target brew time has been met on the machine
- Save these parameters into your recipe, Disc Distance value and Brew Time target
- Enable GbS
- Repeat the above steps for all the recipes that you set on the GbS grinder

Because of a one-way communication, the machine will not know which recipe was last ground.
So it is the care of the barista to ensure that the correct recipe on the correct group head is selected.

4.6 How are the grind-brew events matched?

Grind events and brew events are initiated by the barista. If the grinder and coffee machine are connected, the actual brew event will be matched to the last grind event. The resulting combination of the grind size according to the disc distance setting of the grinder and the brew time of the coffee machine is called grind-brew-events (Grind-brew-events). They are used to adjust the disc distance to meet the target brew time.

Grind and brew events are only matched if their respective time does not differ too much. Currently the time between these two events has to be below 10 minutes to get the events matched. In case of network outage, such as your local Wifi downtime, you may experience issues with matching. Here the recommendation is to disable GbS and operate the grinder manually until your network is stable.

4.7 When does the Algorithm adjust the disc distance?

Each time a new grind-brew-events is available, the last n (n currently 4) grind-brew-events are used to determine an improved disc distance. From the n grind-brew-events, the largest and smallest brew-times are discarded. The remaining n – 2 grind-brew-events are averaged.

This average is used to adjust disc distance in small steps to meet the target brew time independently for each grinder recipe and coffee machine group head.

Below a visual description of how the data is handled. The last highest and lowest values are discarded, and the remaining 2 values are averaged.

Event #	1	2	3	4	5	6	7	8	9	10	AverageBrewTime
BrewTime (s)	28	25	27	22	23	28	22	29	25	27	25,00
		25	27								26,00
		25			23						24,00
			27		23						25,00
					23		22				22,50
					23	28					25,50
						28			25		26,50
									25	27	26,00

4.8 Why is the GbS adjusting when I think it shouldn't?

Grind-brew events might not lead to an adjustment, even if the target brew time is not yet met. Equally, an adjustment in a direction opposite to what the barista expects might happen, because although the barista has seen the last brew time, the algorithm will see the average of the events as explained previously.

Grind-by-sync adjusts in bigger steps if the last brew times differ a lot from the target brew time. The closer the last grind-brew-events are to the desired target brew time, the smaller the steps will be.

Grind-by-sync is currently designed to keep the grinder and the coffee machine close to the desired brew time.

RECOMMENDATION: It is advisable to dial in the grinder recipe to be already close to the desired brew time.

4.9 How does GbS handle changes in recipe and changes in group head?

Changing the grinder recipe or the coffee machine group head may lead to a bigger change in grind size from the last grind to the actual grind. GbS may take several Grind-brew-events to adjust to the actual target brew time.

4.10 Why does the grinder adjust after I manually dialed-in?

A separate instance of the GbS algorithm runs for each combination of grinder recipe, coffee machine ID, coffee machine group head and coffee machine dose.

The instance of the algorithm is initialized separately for any of the above combination, when the first grind-brew-event for this combination is received; The initial value of the disc distance is the recipe value at the time of instantiation.

NOTE: If GbS is disabled and enabled later on, the algorithm will continue with the disc distance, determined with the last grind-brew-events before disabling GbS. If the disc distance was changed in between, this change will be discarded.

4.11 Is portafilter swapping possiible between each group head?

The same portafilter and recipe can be used for different group heads on the coffee machine; The algorithm will run as an own instance for each group head, e.g. the grind-brew-events for the one group head will only be used to adjust the disc distance using this group head.

Since the grinder does not have the information, which group head will be used by the barista for the next coffee shot, the grinder will assume and adjust for the last group head used.

RECOMMENDATION: When using the same portafilter for different group heads, it's recommended to use separate recipes for each group head.

4.12 Does the algorithm consider manually stopped doses on the machine?

The algorithm discards manually stopped brew events.

4.13 How does the algorithm handle consecutive shots?

Heuristic matching will use the last grind event received before the brewing event. Therefore, if there are two grind-events first (without any brew-event) and then a coffee shot is done, the brew-event will be matched to the last grind-event. The first grind event will not be used for any grind-brew matching.

If the subsequent grind is used for a further coffee shot, the same grind event will be used to match to this brew event.

NOTE: Especially for grind-events due to purging, and after that a further grind-event, the purging grind will not be used.

RECOMMENDATION: As a barista, please complete an entire grind-brew event. i.e. do not perform batching grinding and subsequently batch brewing with a GbS recipe, always ensure to grind and immediately brew.

4.14 When setting a single and double dose on the grinder, are these matched with the machine?

The correspondence between grinder recipes and coffee machine Doses is done by the barista. The grinder and machine will not know the equivalence. The algorithm uses an own instance for each combination of coffee machine ID, grinder recipe, coffee machine group head and coffee machine dose.

If the same grinder double dose recipe is used with group-head one and group-head two of the coffee machine, the disc distance will be adjusted for each group-head independently.

RECOMMENDATION: Use different grinder recipes for different coffee machine Doses.

4.15 How is the algorithm expected to behave when the barista switches between two recipes?

For different grinder recipes the control works independently. Each match of grind-brew events will be used for the respective instance of the control algorithm.

When changing the recipe on the grinder, the grinder will adjust the disc distance to the adjusted value for this recipe (i.e. 25 s) and the following grind-brew-match will be used for further adjustment by the algorithm.

When changing to the other recipe (i.e. 30 s) the grinder will adjust to the last disc distance for this recipe and will take following grind-brew-event(s) to adjust for this recipe.

Same holds true for single dose / double dose recipes.

REMARK: Some coffee retention is to be expected between changing of recipes with differing disc distances, and this will lead to brew times of the subsequent one to three coffee shots.

RECOMMENDATION:

1.) Don't change between recipes with largely different disc distance (i.e. single/double shot) too frequently.
2.) Do a purge on the grinder, if changing between recipes with largely different disc distance

4.16 Does the algorithm have a tolerance on brew time e.g. +/- 2s? Before it adjusts?

Currently the algorithm has an accepted tolerance on brew time of +/- 0.5 s. In a brew sequence of i.e. 23s, 27s, 28s, 22s for the same recipe group head and dose the algorithm will use 23s and 27s to determine a new adjustment (which will be 0 for a target brew time of 25 s).

NOTE: For some coffee machines the brew time accuracy on the brew-event has an accuracy of 1/10 of a second. Therefore 23.9s and 27.9s, which may be shown on the display of the coffee machine as 23s, and 27s, result for the algorithm to 25.9 s, which will still lead to an adjustment.

4.17 How are events matched when using one recipe with several group heads?

There is a separate instance of the algorithm running for each group head even for the same recipe of the grinder. Each time, when a matched grind-brew-event is received the algorithm will determine necessary adjustments of the disc distance.

The grinder may change the disc distance according to this adjustment for the group head just used.

RECOMMENDATION: Use different recipes for different group heads, to enable the grinder to know for which group head the next grinder dose will be used.

4.18 How are events matched when using more than one recipe with several group heads?

There is a separate instance of the algorithm running for each combination of grinder recipe and group head. Therefore any combination of coffee machine group head and grinder recipe will be adjusted separately. Nevertheless this may lead to an unwanted change of disc distance between grinds.

RECOMMENDATION: Use different recipes for different group heads, to enable the grinder to know for which group head the next grinder dose will be used.

4.21 How does the algorithm decide on the adjustment increments?

We cannot reveal a lot about the algorithm due to the intellectual property aspects, however, in principle,
it is monitoring a series of extraction/brew time events and assessing the increment amount needed to adjust such
that the correct brew time is achieved. It doesn't offer the user the ability to set a range, since the objective
of the algorithm is to be as accurate and precise as possible.

4.22 How is the algorithm expected to behave if there are several grinders matched to one machine?

The coffee machine does not know from which grinder the coffee dose originates from. Therefore the last
grind-event (before the brew-event) will be used for the grind-brew matching. The matched grind-brew-event will then
be sent to the grinder where the grind-event belongs to and will be used on this grinder for adjustment.

RECOMMENDATION: As a barista, please use a single transaction in progress concept, i.e. grind one dose and brew the
coffee shot. Don't grind several doses before brewing the coffee shot and afterwards use them for several coffee shots.

How does the algorithm behave with GbS grinder alongised a non-GbS Grinder?

Enabling or disabling GbS does not affect the matching of grind-brew-events. Disabling GbS just disables the algorithm
to run and therefore will especially not lead to any disc distance adjustment.

Using a non-GbS grinder (like GbW) does not interfere with GbS at all, because these grinders to not provide any
grind-events and are not able to accept any grind-brew-matched events

The coffee machine does not have information, from which grinder a dose for a coffee shot does originate.
Therefore the last grind-event (before the brew-event) will be used for matching (even if GbS is disabled on that grinder).
The matched grind-brew-event will then be sent only to the grinder, the grind-event belongs to and will be used on
that grinder for adjustment.

RECOMMENDATION: As a barista, please use a single transaction in progress concept, i.e. grind one dose
and brew the coffee shot; Don't grind several doses before brewing the coffee shot and afterwards
use them for several coffee shots.

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Grind-by-Sync

4.23 What happens if I use a coffee-shot button for rinsing?

Using a coffee-shot button for rinsing may interfere with the GbS-Algortihm. Use the "continuous" rinsing button instead.

Note: Don't use a coffee-shot button for rinsing.

4.24 Do I need an automatic tamping for GbS?

Yes, an automatic tamper is highly recommended as it keeps the puck consistency stable which reduces the number of variables in the coffee preparation process.
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