



OWNER'S MANUAL

11/07/2022 | REV00
668421-MAN-EN

CONTINUOUS BRIX READER



Thank you for choosing a CDL continuous brix reader. Since 1995, our years of experience working with sugar makers ensures you that you acquired a performant and quality piece of equipment. Before using this product, make sure you understand all the following instructions. If there is any problem upon reception of this product, please immediately contact CDL or your local representative.

CDL Brix Reader User Manual

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Conditions to be observed when using

Environmental conditions

- ◇ Use the instrument at an altitude below 2,000m (above sea level).
- ◇ Use the instrument indoors.
- ◇ Use the instrument where the temperature is between 5 to 40°C.
- ◇ Do not leave the instrument in a location exposed to direct sunlight or near a heating unit where the temperature may rise.
- ◇ Do not change the environmental temperature of the instrument suddenly.
- ◇ Do not place the instrument in a place where it may be subject to strong vibrations.
- ◇ Do not use the instrument where there is much dust.
- ◇ Do not leave the instrument where the temperature is extremely low.
- ◇ Do not leave the instrument in a damp place.
- ◇ Do not place or drop heavy objects on the instrument.

Operation Display

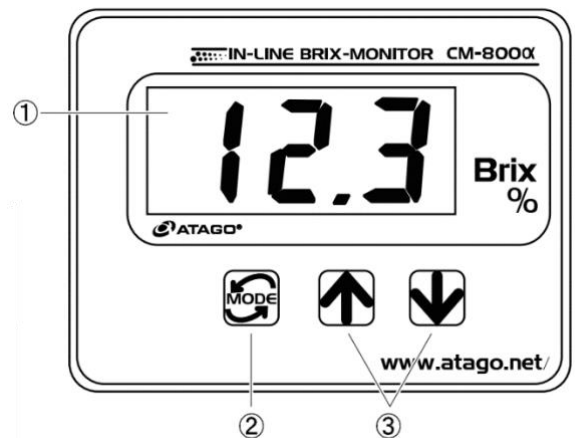
① Measurement value display

Digitally displays the measurement value [Brix (%)], setting mode, and other setting values.

② key


Switches or sets the display mode of the measurement value and the setting mode.


Setting mode number	Setting description
[0]	Measurement Interval and Mode-S Level
[1]	Adjustment to the reference
[2]	Temperature correction factor
[3]	Recorder output, lower limit value
[4]	Recorder output, upper limit value
[5]	Changing the Number of Decimal Places Displayed



③ Up and down keys

Increase or decrease the value in each setting mode.

The down  key also switches the display of each setting mode.

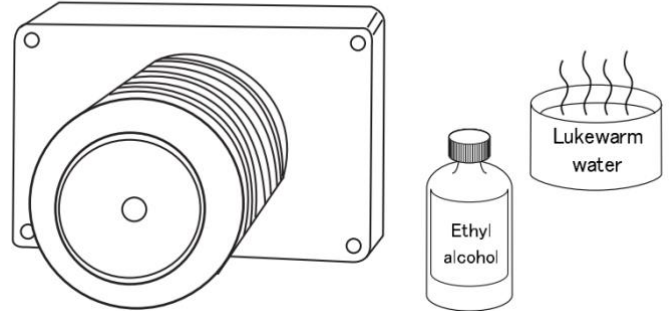
The temperature is displayed when press the down  key while measuring a sample.

Cleaning the Prism

***See recommendations below.**

① Detach the clamp band that connects the main unit to the sample inlet unit, piping or tank.

② Clean the prism surface carefully with a soft tissue soaked with warm water or ethyl alcohol. If the sample solution contains oil or grease, use ethyl alcohol to ensure the prism surface does not develop a film. Development of a film on the prism could cause erroneous measurements.



③ NEVER clean the prism with an abrasive material.

Cleaning the prism with an abrasive material could cause scratches on the prism which could lead to erroneous measurements.

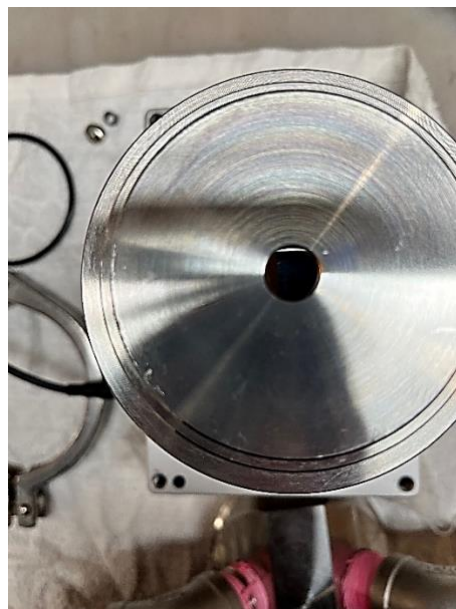
*Although these are the recommendations made by the manufacturer, considering the type of product used either maple syrup, CDL recommends cleaning with a Sani Clean solution and rinsing with filtrate, always using a sponge or a soft cloth in both cases.

As an example, here are two photos:

If the prism is not properly cleaned, a film develops on the prism lens and prevents light from passing through. The refractive index is then incorrect.



The same prism but cleaned according to CDL recommendations.



CONTINUOUS BRIX READER (0-80 BRIX) ATAGO 668421 CALIBRATION PROCEDURE

Calibration procedure

Mode 1: Reference adjustment (see page 6)

- Calibrate with distilled water or filtrate.
(clean lines with permeate, test permeate to confirm that it is mineral free)
- Run continuously with distilled water.

Mode 2: Temperature correction factor

- You may need to adjust this value to 1.1 (this data has been found by trial and error).
This data can be adjusted when the Brix reader does not give same reading as your manual or electronic refractometer, but ideally correct the value in mode 1.

Note:




- **Every day, you have to compare the syrup with a refractometer (ideally Misco model #668412) which must be calibrated before use with distilled water.**
- Always mix well the syrup with permeate for calibration.






Adjusting to the Reference


In principle, "adjusting to the reference" is not necessary if your equipment is well cleaned.

NOTE Before adjusting to a reference solution, confirm that the prism surface is clean (see page 4).
NOTE Before adjusting to the reference with distilled water, set the temperature correction factor to "1.00".

- ① Confirm that the sample inlet unit is properly connected to the piping.
- ② Let distilled water or a reference sample flow through the piping.
- ③ Supply power to the CM-800α.
The current Brix (%) is displayed.
- ④ Press the  for one second. After [0] is displayed, press the  key once to display [1] (Fig.12-1).
Then, press the key .

⑤ When the Brix (%) value blinks, adjust the value to 0.0% for distilled water or to the true value for the reference sample by using the  and/or  keys (Fig.12-2).

⑥ Pressing the  sets the adjustment and the display returns to [1] (Fig.12-1).

⑦ Each time the  is pressed, the menu item displayed switches in the order of: [2], [3], [4], [5], and Brix (%).
Select Brix (%).

NOTE If 30 seconds pass when in steps ④ through ⑥ above, the display returns to the continuous Brix (%) display.

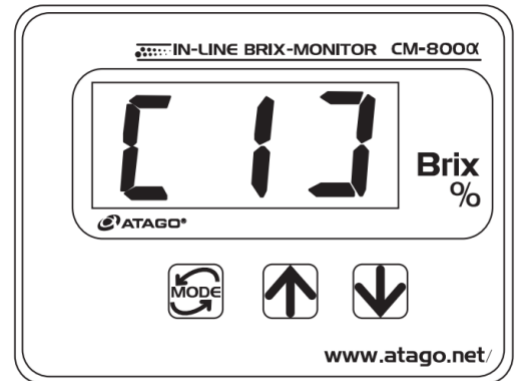


Fig.12-1

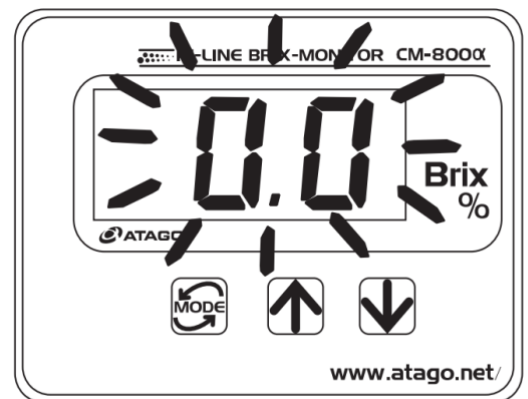











Fig.12-2 Example of the adjustment to the Brix 0.0%

To reset the reference point to original factory settings

- ① While the Brix (%) is blinking in step ⑤ above, press and hold down both the  and  keys at the same time. After 5 seconds, the display will clear. Release the keys and the original standard Brix (%) will be displayed.
- ② The reference point is now reset to original factory settings.

Inputting the temperature correction factor

In principle, "inputting the temperature correction factor" is not necessary if your equipment is well cleaned.

1. Connect the power.
2. The current Brix (%) is displayed on the screen. If there is no sample on the prism surface, [LL.L] will be displayed.
3. Press the  key for one second. [t] is displayed.
Press the  key again and the display will change to [2] (Fig. 13-1).
4. Press the  key. The temperature correction factor will blink on the display (Fig. 13-2).
5. If "1.00" is displayed, the temperature correction value is for sucrose. To change this setting, press the  or  keys until the desired factor is displayed.
6. Pressing the  key sets the adjustment of the temperature correction factor and the display returns to [2] (Fig. 13-1).
7. Each time the  key is pressed, the menu item displayed switches in the order of: [3], [4], [5], and Brix (%).
Select Brix (%).

MEMO

If 30 seconds or more has passed at any of the ③ through ⑥ stage, the display enters into the continuous display mode of the Brix (%) values.

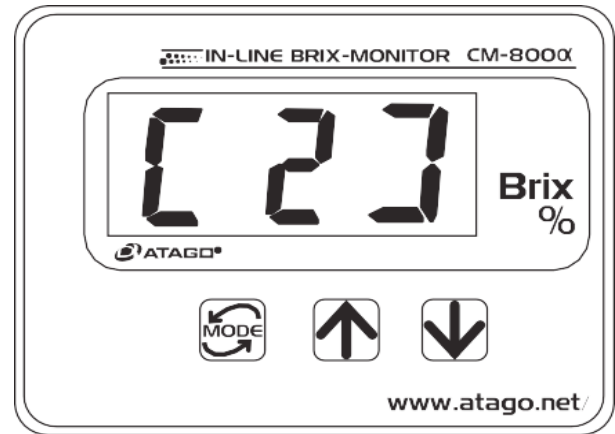


Figure 13-1



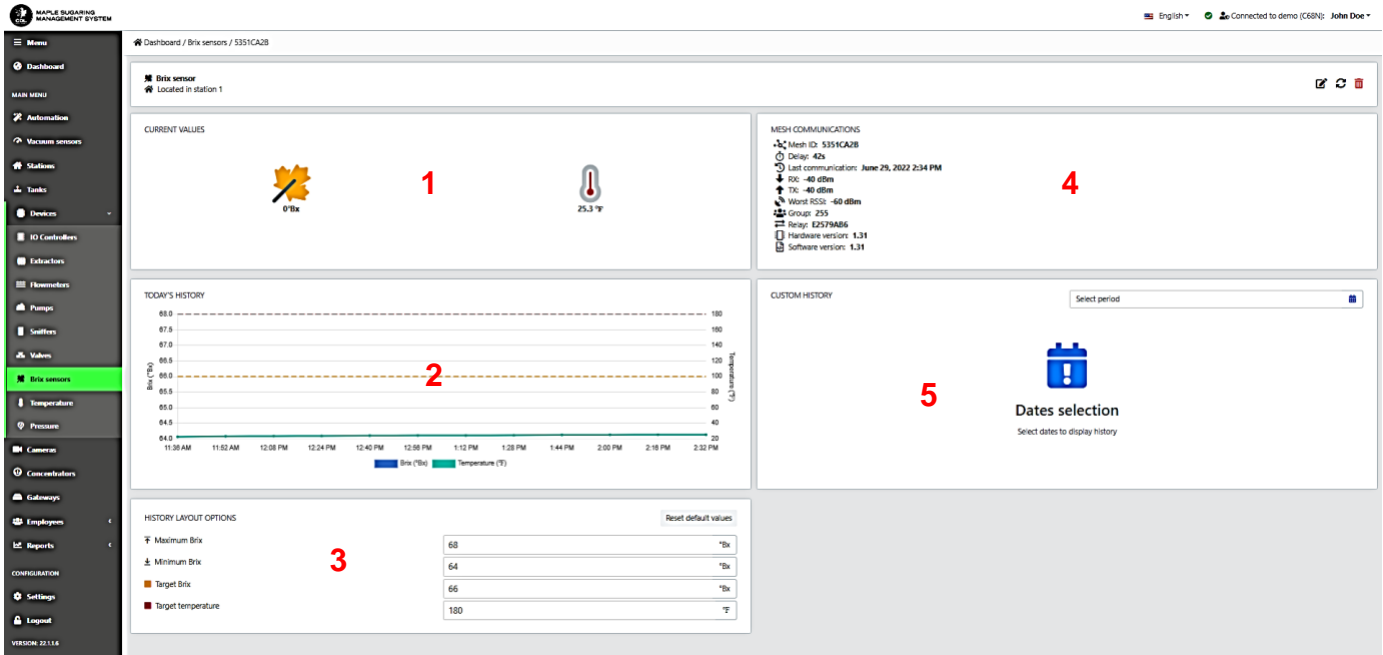
Figure 13-2

Exemple d'une modification du facteur de correction de la température à 2,00.

See Table 13.1 on page 10 for possible correction factors.

CDL intelligence system

It is possible to integrate the reading of product 668421 into CDL monitoring with our product #21126A.



→ CURRENT VALUES (1)

Gives the current brix value and the current temperature value.

→ TODAY'S HISTORY (2)

Today's history graph showing temperature and brix.

→ HISTORY LAYOUT OPTIONS (3)

Parameters according to the user.

(Maximum brix, Minimum brix, Target brix, Target temperature)

→ MESH COMMUNICATIONS (4)

Mesh communication.

(Mesh ID, Delay, Last communication, Rx, Tx, Worst RSSI, Group, Relay, Hardware version, Software version)

→ CUSTOM HISTORY (5)

Access to a history according to predefined dates.

Error Codes & Troubleshooting

Error code	Possible causes	Actions to be taken
LL.L	The sample is not covering the prism surface completely.	Run a sample with a Brix (%) that is known to be within the indication range (Brix 0.0 to 80.0%). Confirm that the error code [LL.L] is replaced by the known Brix (%).
	A sample with a Brix (%) lower than the lower limit value of the indication range (Brix -2.0 to 80.5%) is being measured.	Run a sample with a Brix (%) that is known to be within the indication range (Brix 0.0 to 80.0%). If [LL.L] is still displayed, please refer to page 6. Follow the instructions on this page to set the reference value to the Brix (%) of the known sample
HH.H	A sample with a Brix (%) that exceeds the upper limit value of the indication range (Brix -2.0 to 80.5%) is being measured. If the Brix (%) of the sample is extremely high, the error code [EE.E] will be displayed.	Run a sample with a Brix (%) that is known to be within the indication range (Brix 0.0 to 80.0%). Confirm that the error code [HH.H] is replaced by the known Brix (%).
	The prism surface is dirty.	Run a sample with a Brix (%) that is known to be within the indication range (Brix 0.0 to 80.0%). If [HH.H] continues to be displayed, the prism surface may need to be cleaned. Clean the prism carefully as described on page 4.
EE.E	A sample with a Brix (%) that significantly exceeds the upper limit value of the indication range (Brix -2.0 to 80.5%) is being measured.	Run a sample with a Brix (%) that is known to be within the indication range (Brix 0.0 to 80.0%).
	The prism surface is dirty.	If [EE.E] is displayed and the sample is known to have a Brix (%) within the indication range, the prism surface may need to be cleaned. Clean the prism carefully as described on page 4. If [EE.E] is continually displayed after the above procedures have been carried out, please contact an Authorized ATAGO Distributor.
...	The prism temperature is below 0°C or above 130°C. In this case, the displayed Brix (%) value is not properly corrected for temperature.	Run a sample at a temperature of 5 to 100°C. When doing so, confirm that [...] disappears.

Table 13-1 Table of temperature correction values for sucrose (g/100g) for refractometer
(reference at 20°C, 589nm)

Température (°C)	Saccharose (g/100 g)																	
	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85
15	-0,29	-0,30	-0,32	-0,33	-0,34	-0,35	-0,36	-0,37	-0,37	-0,38	-0,38	-0,38	-0,38	-0,38	-0,38	-0,38	-0,37	-0,37
16	-0,24	-0,25	-0,26	-0,27	-0,28	-0,28	-0,29	-0,30	-0,30	-0,30	-0,31	-0,31	-0,31	-0,31	-0,31	-0,30	-0,30	-0,30
17	-0,18	-0,19	-0,20	-0,20	-0,21	-0,21	-0,22	-0,22	-0,23	-0,23	-0,23	-0,23	-0,23	-0,23	-0,23	-0,23	-0,23	-0,22
18	-0,12	-0,13	-0,13	-0,14	-0,14	-0,14	-0,15	-0,15	-0,15	-0,15	-0,15	-0,15	-0,15	-0,15	-0,15	-0,15	-0,15	-0,15
19	-0,06	-0,06	-0,07	-0,07	-0,07	-0,07	-0,07	-0,08	-0,08	-0,08	-0,08	-0,08	-0,08	-0,08	-0,08	-0,08	-0,08	-0,07
20	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
21	+0,06	+0,07	+0,07	+0,07	+0,07	+0,07	+0,08	+0,08	+0,08	+0,08	+0,08	+0,08	+0,08	+0,08	+0,08	+0,08	+0,08	+0,07
22	+0,13	+0,14	+0,14	+0,14	+0,15	+0,15	+0,15	+0,15	+0,16	+0,16	+0,16	+0,16	+0,16	+0,16	+0,15	+0,15	+0,15	+0,15
23	+0,20	+0,21	+0,21	+0,22	+0,22	+0,23	+0,23	+0,23	+0,23	+0,24	+0,24	+0,24	+0,24	+0,23	+0,23	+0,23	+0,23	+0,22
24	+0,27	+0,28	+0,29	+0,29	+0,30	+0,30	+0,31	+0,31	+0,31	+0,32	+0,32	+0,32	+0,32	+0,31	+0,31	+0,31	+0,30	+0,30
25	+0,34	+0,35	+0,36	+0,37	+0,38	+0,38	+0,39	+0,39	+0,40	+0,40	+0,40	+0,40	+0,40	+0,39	+0,39	+0,38	+0,38	+0,37
26	+0,42	+0,43	+0,44	+0,45	+0,46	+0,46	+0,47	+0,47	+0,48	+0,48	+0,48	+0,48	+0,48	+0,47	+0,47	+0,46	+0,46	+0,45
27	+0,50	+0,51	+0,52	+0,53	+0,54	+0,55	+0,55	+0,56	+0,56	+0,56	+0,56	+0,56	+0,56	+0,55	+0,55	+0,54	+0,53	+0,52
28	+0,58	+0,59	+0,60	+0,61	+0,62	+0,63	+0,64	+0,64	+0,64	+0,65	+0,65	+0,64	+0,64	+0,63	+0,63	+0,62	+0,61	+0,60
29	+0,66	+0,67	+0,68	+0,70	+0,71	+0,71	+0,72	+0,73	+0,73	+0,73	+0,73	+0,73	+0,72	+0,72	+0,71	+0,70	+0,69	+0,67
30	+0,74	+0,76	+0,77	+0,78	+0,79	+0,80	+0,81	+0,81	+0,82	+0,82	+0,81	+0,81	+0,80	+0,80	+0,79	+0,78	+0,76	+0,75
31	+0,83	+0,84	+0,85	+0,87	+0,88	+0,89	+0,89	+0,90	+0,90	+0,90	+0,90	+0,89	+0,89	+0,88	+0,87	+0,86	+0,84	+0,82
32	+0,92	+0,93	+0,94	+0,96	+0,97	+0,98	+0,98	+0,99	+0,99	+0,99	+0,99	+0,98	+0,97	+0,96	+0,95	+0,93	+0,92	+0,90
33	+1,01	+1,02	+1,03	+1,05	+1,06	+1,07	+1,07	+1,08	+1,08	+1,08	+1,07	+1,07	+1,06	+1,04	+1,03	+1,01	+1,00	+0,98
34	+1,10	+1,11	+1,13	+1,14	+1,15	+1,16	+1,16	+1,17	+1,17	+1,16	+1,16	+1,15	+1,14	+1,13	+1,11	+1,09	+1,07	+1,05
35	+1,19	+1,21	+1,22	+1,23	+1,24	+1,25	+1,25	+1,26	+1,26	+1,25	+1,25	+1,24	+1,23	+1,21	+1,19	+1,17	+1,15	+1,13
36	+1,29	+1,30	+1,31	+1,33	+1,34	+1,34	+1,35	+1,35	+1,35	+1,34	+1,34	+1,33	+1,31	+1,29	+1,28	+1,25	+1,23	+1,20
37	+1,39	+1,40	+1,41	+1,42	+1,43	+1,44	+1,44	+1,44	+1,44	+1,43	+1,43	+1,41	+1,40	+1,38	+1,36	+1,33	+1,31	+1,28
38	+1,49	+1,50	+1,51	+1,52	+1,53	+1,53	+1,54	+1,54	+1,53	+1,53	+1,52	+1,52	+1,48	+1,46	+1,44	+1,42	+1,39	+1,36
39	+1,59	+1,60	+1,61	+1,62	+1,63	+1,63	+1,63	+1,63	+1,63	+1,62	+1,61	+1,59	+1,57	+1,55	+1,52	+1,50	+1,47	+1,43
40	+1,69	+1,70	+1,71	+1,72	+1,73	+1,73	+1,73	+1,73	+1,72	+1,71	+1,70	+1,68	+1,66	+1,63	+1,61	+1,58	+1,54	+1,51