REBEL

User Manual

Software V1.4.2 February 2025







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About Your REBEL



Specifications





Operating Considerations

Physical: height (22 in/56 cm), width (13 in/33 cm), depth (27 in/69 cm) Weight: 83 lbs (38 kg)

Power: 100–240AC, 50-60 Hz, 350W Overvoltage Cat II: max transients up to 2.5 kV) Class 1 Laser Product: 21CFR 1040.10 & 1040.11 Certifications: UL/CSA/IEC 61010-1 3rd Edition Ambient Operating Temperature: 20°C–25°C Ambient Humidity: 20–80% RH (non-condensing) Altitude: 0–2000m

Your Data

Output: Values reported in "mM" concentration Report format: CSV and PDF

Software

Designed for operation in cGLP/CGMP, with support for 21 CFR Part11-compliance

The Device

Calibration: Automated calibration and QC with consumable kits System Interfaces: Ethernet, USB port (2) Solvent waste collected in dedicated vessel with level sensing Condensate (water) collected in dedicated vessel with level sensing

Compliance

Safety/Compliance: UL/CSA/IEC 61010-1 3rd Edition; CE marked; EU & China RoHS; EU REACH



Anatomy: Front





Anatomy: Installation / Connectivity







 REBEL should be placed on a secure table/bench or other flat level surface rated for the specified size and weight.



Analytes Measured, SMA v2 Kit

Using the SMA v2 kit, REBEL measures these 33 analytes.

Amino Acids (22)

Alanine Alanyl-Glutamine Arginine Asparagine Aspartic acid Betaine Cystine Glutamic Acid

Biogenic Amines (6)

β-alanine Citrulline GABA Hydroxyproline Methyl-L-histidine Sarcosine Glutamine Glycine Histidine Isoleucine Leucine Lysine Methionine Phenylalanine Proline Serine Threonine Tryptophan Tyrosine Valine

Vitamins (5)

Choline Nicotinamide Pyridoxal Pyridoxine Thiamine

SMA v2



Setting Up Your REBEL



Boot-up and User Management

- Manually toggle REBEL power switch to ON
- System Settings > User Accounts (boots here during training only for user setup)
- Login as existing user or create a new user
- Each user can be enabled/disabled, assigned user or admin rights, and custom auto-logout (5, 10 or 30 min)





Logging in as an existing user

Creating a new user account



Dashboard



Home View progress of samples in a batch analysis



Run Setup Import batch sheet, edit sample parameters, & start run



Timeline View queue in progress and quant result history



System Settings

Start & shutdown REBEL and edit settings





Spent Media Analysis (SMA v2) Consumables Kit—About

- REBEL Standards*-3 sets x 7 vials
- Background Electrolyte[†] (BGE)–2x250 mL
- Diluent with internal standards[†]-2x125 mL
- 96 microwell plates with covers (2)
- REBEL Chip-rated for 200 sample runs
- * Standards ship in separate cold box; refrigerate upon arrival for storage.
- [†] Store BGE and diluent in kit at room temperature



Quantitat	tion range	for optimal dilutior	of samples			
SMA V2 Analytes (33)	Short Name	Lower Limit of	Upper Limit of			
	onore nume	Quantitation (LLOQ)	Quantitation (ULOQ)			
DL-Alanyl-DL-Glutamine	AQ					
DL-Alanine	Ala					
DL-Arginine	Arg					
DL-Asparagine	Asn					
DL-Aspartic acid	Asp					
Betaine	Betaine					
Choline	Choline					
DL-Citrulline	Cit					
Glycine	Gly					
DL-Histidine	His					
DL-Hydroxyproline	Нур					
DL-Isoleucine	lle	5 μΜ	100 μΜ			
DL-Leucine	Leu					
DL-Lysine	Lys					
DL-1-Methylhistidine	1MH					
DL-Methionine	Met					
DL-Phenylalanine	Phe					
DL-Proline	Pro					
DL-Serine	Ser					
DL-Threonine	Thr					
DL-Tryptophan	Trp					
DL-Tyrosine	Tyr					
DL-Valine	Val					
DL-Glutamine	Gln	ENA	75			
DL-Glutamic acid	Glu	5 μivi	73 μivi			
DL-Cystine	Cystine	5 μΜ	50 μΜ			
DL-β-Alanine	βAla					
Thiamine	B1					
Pyridoxine	B6-OH					
Pyridoxal	B6-Oxo	5 μΜ	25 μΜ			
Nicotinamide	NAM	M				
β-Aminobutyric acid	GABA					
Sarcosine	Sarcosine					



Loading Consumables

Important

- Refrigerate REBEL standards (ideal temperature range 2–8°C) vials until use. Do not freeze.
- Once pierced, standards expire after 14 days.
- Once in use in REBEL, BGE and Diluent expire after 30 days.
- Refer to unique expiration dates on the standards pouch and bottles in kit.
- Solvents in Diluent and Background Electrolyte (BGE) are volatile cap bottles when not in use.
- Load REBEL standards into F1-F7 in right vial holder with blue capped vials in F1-F2.
- 2. Confirm dip tube and red cap are attached to waste bottle in rear position as shown.
- 3. Remove BGE cap. Attach dip tube and cap, ensuring dip tube is fully submerged in REBEL BGE solution. Load into front position as shown.
- 4. Use REBEL Diluent to dilute samples and load into vial in tray or 96 well plate. Load into left tray position and replace sample tray cover.
- 5. Follow on-screen prompts to run a Quantitative Calibration cycle after installing a new set of standards. (see page 14).





Loading the REBEL Chip

- 1. While wearing gloves, remove chip from foil pouch
- 2. Hold the chip cover bottom-up with screw heads visible.
- 3. Seat the chip (barcode up) into the matching recess until flush.
- 4. Flip assembly over with barcode down.
- 5. Carefully clip assembly into REBEL chip carrier— it must click in flush on two sides.
- 6. Run Quantitative Calibration (see next page)



Chip assembly = REBEL chip + chip cover



Flip the assembly and click into <u>REBEL chip carrier</u> using both side clips



Quantitative Calibration and Performance Qualification (PQ)

Navigation

• Select System Settings > Tools > Quantitative Calibration.

About

- Quantitative Calibration regulates sensors for a new consumables kit and completes in about two hours. This process uses vials F3–7 (right tray).
- Performance Qualification (PQ) automatically makes a pass/fail check after every five samples; this takes confirms that your REBEL remains calibrated during analysis of a batch. This process pulls from vials F1–2 (blue caps). To run a PQ manually, navigate to: System Settings > Tools > Performance Qualification.

When to run a new Quantitative Calibration

- Required when using a fresh kit
- Recommended whenever the chip or standards vials are replaced, or when replacing the BGE bottle after several days of inactivity
- Recommended when PQ results repeatedly fail

Recommendations

- Review Quantitative Calibration and PQ reports in History with PASS/FAIL metrics
- If Quantitative Calibration does not complete or fails, contact your Field Applications Scientist or help@908devices.com



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Reviewing Quantitative Calibration Reports

Quantitative Calibration and Performance Qualification (PQ) reports show current performance metrics along with ideal ranges.

Important

- Check **every** Quantitative Calibration and PQ report on screen or as a PDF to confirm that all performance metrics are in range.
- In case of repeated PQ FAIL messages, run Quantitative Calibration again (System Settings > Tools > Quantitative Calibration)

<	Batch S Quantit EXPORT	umr ativ	nary e Cal	ibratio	on	Quantitati Report	Quar Serial	libration ntitative Calibra Number: R194	ation Report	BE	L	
1.	RF7	QC-100ul	N	2	022-05-06T14:43:39		Sumn	nary Result: PASS	2021.10.19			
	RF6	QC-50uN	1	2	022-05-06T14:43:39	Test Parame Calibrated Ana	ter lytes	Results PASS	Value 32.00	Bounds [30.00 32.00]		
	RF4	QC-10uM		2	022-05-06T14:43:39	Overall Relativ IS Calibrated	e Error	PASS PASS	8.75 4.00	[0.00 15.00] [4.00 4.00]		
	RF3	QC-5uM		2	022-05-06T14:43:39	Mass Range IS	Coverage	PASS	3.00	[2.00 inf]		
11.	RF5	QC-25uM		2	022-05-06T14:43:39	Service Di Parameter Method Backg	agnost	tics Value 2.28				
						Ambient Backg	round	7.25				
~	Image: A start of the start	Time Co Summa	Test Rej ompleted irv Result	port Fri May 6 14:4 PASS	13:39 2022	 ≫908 devices	Perfo Repor	rmance Qua rt Perfor Serial N. Time Co Summar	mance Qual mber: R15 mpleted: 13: y Result: PA3	ification Rep 98 19 2021.10.19 55	BE	
	110.121		e	CROME.			Inter	rnal Standards Found	PASS PASS	Value 4.00	Bounds [4.00 4.00]	- 1
	Test Parameter Calibrated Analy Overall Relative & IS Calibrated Mass Range IS Co	tes Error overage	Result Pass Pass Pass Pass	Value 33.00 7.01 4.00 2.00	Boundaries [31.00-33.00] [0.00-15.00] [4.00-4.00] [2.00-Inf]		Arg I Ser M Asp I Ile/Li Gln/O Quar	Migration Index Migration Index Migration Index eu Resolution Glu Resolution ntitation Quality	PASS PASS PASS PASS PASS PASS	0.13 0.52 0.86 1.59 0.85 1.00	 [0.11 0.16] [0.50 0.55] [0.83 0.88] [1.10 inf] [0.30 inf] [0.00 6.00] 	
	Method Backgrou Ambient Backgro	und	Info Info	12.00 16.65			Ser Para Meth Amb	rvice Diagnostic	S /alue 1.86 5.82			
	A	+			袋	*9	08 device	5	Page 1 of 3	upport: help@908	devices.com +1.844.908	8.4357



Reviewing Performance Qualification (PQ) Reports

Performance Qualification (PQ) check automatically runs every five (5) samples and takes just a few minutes to confirm that your REBEL is still calibrated during analysis of a batch.

Results

There are three possible results for each test:

- **Pass** indicates that parameters are within ideal operational range
- Pass (Warn) indicates that the measured value is close to failure thresholds, but analysis can proceed as planned. Please check for background volatile organic signal or replace the REBEL chip with a new one at your earliest convenience.
- Fail: indicates that parameters are outside of ideal operational range.

Note: information from the **Service Diagnostics** section may be requested by Customer Support.





Preparing Your Samples



REBEL Sample Preparation

Workflow



Filter sample

Dilute & mix with REBEL

diluent



Load samples in vials or plate



Import batch

and press

"Start"

REBEL report complete!

Steps for Sample Dilution

- 1. Filter: To remove cellular debris, centrifuge samples using sterile microcentrifuge tube filters or use (0.22 μ m) syringe lock filters with nylon membrane.
- 2. Volume: Make enough diluted sample.
 - Vial: 1000 μL min per 2 mL vial
 - Plate: 200 μ L min per microwell
- Range: Get in range with your dilution factor. Utilize range finding tool for optimal dilution factor. Consider several dilutions may be needed to get all analytes in range.
 - Calibration range for all analytes: see page 11
 - 10x is the minimum dilution factor
- **4. Mixing**: Vortex vials or aspirate dilutions in wells with pipette to ensure thorough mixing.
- 5. **Cover**: Secure vial caps or well plates covers properly to avoid evaporation. Do not reuse.

Media example	Try Diluting
Feed supplement	1000x
Microbial	250x
CHO, Insect, HEK293	100x
MSC	10-50x
T-cell	25x
DMEM	10x
Yeast	10x

Tip: Consider robotic dilutions or multichannel pipettes for heavy routine sample prep, e.g., batches routinely 20+ samples.

Tip: For a detailed dilution guide, check out our <u>Customer</u> <u>Support Portal</u>.



Range Finding Tool

This tool is designed to assist in determining the optimal dilution factor for a sample.

- Choose a representative sample from your process and prepare a range of dilutions for analysis.
- Navigate to the Systems Settings menu and then the Tools tab.
- Within the tools tab, select Range Finding.
- Select the dilutions which you want to test, label your experiment, and Go!





Setting Up a Batch



Set Up a Batch

Are your samples diluted and ready for analysis?

Best option: Import

- Complete your batch sheet (see next page)
- Select "+" then Import Runsheet
- Locate the batch sheet on network or USB, then press **Select**
- Place your vial tray or well plate in the left tray

Manual option

For a single sample or small batches

- Confirm tray size, name your batch, and add sample information directly on screen
- Add each sample, then Add Batch to Queue







A batch sheet (*.csv or *.xlsx) tells the REBEL essential batch, user, and sample information

- Download the batch sheet template from our portal (www.908devices.com/support)
- After sample prep, complete required fields in the batch sheet.
- If a **required field** turns red in the *.xlsx formatted sheet, please review and fix the entry. REBEL will not be able to run a batch with sheet errors.
- You may also add custom columns (in column H and beyond) for additional sample descriptions or other metadata, which will be exported with the results.
- Save batch sheet on network drive or USB for import.

	A	В	С	D	E	F	G
1	Header	3					
2	Name	(enter batch name)					
3	User	(enter user na	me)				
4	Tray Type	(enter: 48, 96 l	.ow)				
5	Comment	(enter commer	nt)				
6							
7	PlateRow	PlateColumn	SampleLabel	Replicates	DilutionFactor	UserName	Comment
8	A	1	Media Z	1	100	bob	100x dilution of media received 9/15/19
9	В	1	Media Y	1	100	bob	100x dilution of media received 9/15/19
10	С	1	Media X	1	100	bob	100x dilution of media stored 8/15/19
11	D	1	Media X	1	100	bob	100x dilution of media stored 8/21/19
12	E	1	Media X	1	100	bob	100x dilution of media stored 9/1/19



Access our Customer Support Portal: <u>www.908devices.com/support</u>



Review & Edit Sample Info





Report Formats

Report format options are located under System Settings > Storage/Export. See <u>page 44</u> for approximate file sizes.

Analyte concentrations are listed in mM ± standard error

Error is calculated from calibration for each run, not standard deviation based on replicates

- On screen = concentration as mean of all replicates for that sample
- CSV report = single CSVs with concentration per replicate and a batch result summary CSV with all replicates in a batch
- PDF report = concentration per rep
- TEL data file = raw data for 908 support
- Include Custom Fields = additional metadata for statistical software packages (e.g., JMP)

Batch analysis is easy!

Download the Pivot Table Guide from our Customer Support Portal!



Spent Media Analys Sample Label: PQ_A User: Colin Gavin	™ REBEL	1
LA2	Spent Media Analysis: Jample Label: PQ_A Time Completed: 20:56 2020.01.15 Silution Factor: 100X (included in results)	
Batch Label: Exit Test RebelChip S/N: RC000331 Comment: none		
Analyte	mM ±	
DL-Alanyl-DL-Glutamine (AQ)	2.8 0.4	
DL-Alanine (Ala)	1.7 0.4	
DL-β-Alanine (βAla)	28 0.5	
DL-Arginine (Arg)	2.4 0.3	
DL-Asparagine (Asn)	2.1 0.4	
DL-Aspartic acid (Asp)	2.9 0.4	
Thiamine (B1)	3.8 0.5	
Pyridoxine (B6-OH)	2.6 0.2	
Pyridoxal (86-Oxo)	2.6 0.2	
Choline	2.4 0.2	
DL-Citrulline (Cit)	2.5 0.2	
DL-Cystine (Cystine)	>LOQ N/A	
y-Aminobutyric acid (GABA)	1.7 0.7	
DL-Glutamine (GIn)	2.7 0.9	
DL-Giutamic acid (Glu)	1.8 0.6	
DL-Glutamine and DL-Glutamic acid (Gl	x) 4.5 1.1	
Glycine (Gly)	ND ND	
DL-Insoane (HS)		
DL-reporting (lip)		
on someone (pe)	Page 1 of 3	
☆908 devices	Support: help#908devices.com +1.844.908.43	357



Time Completed: 21:20 2020.01.15			
Dilution Factor: 100			
Batch Label: Exit Test			
REBEL S/N: 126			
REBEL Chip S/N: RC000331			
COMMENT: none			
FullName	AbbreviatedName	Concentration (mM)	stderr
DL-Alanyl-DL-Glutamine	AQ	2.79	0.43
DL-Alanine	Ala	1.68	0.41
DL-β-Alanine	βAla	2.82	0.46
DL-Arginine	Arg	2.45	0.26
DL-Asparagine	Asn	2.05	0.44
DL-Aspartic acid	Asp	2.92	0.38
Thiamine	B1	3.82	0.47
Pyridoxine	B6-0H	2.64	0.18
Pyridoxal	B6-0xo	2.62	0.22
Choline		2.44	0.23
DL-Citrulline	Cit	2.47	0.19
DL-Cystine	Cystine	>LOQ	N/A
β-Aminobutyric acid	GABA	1.68	0.74
DL-Glutamine	Gln	2.71	0.89
DL-Glutamic acid	Glu	1.75	0.6
DL-Glutamine and DL-Glutamic acid	GLx	4.47	1.07
Glycine	Gly	ND	N/A
DL-Histidine	His	2.76	0.22
DL-Hydroxyproline	Нур	3.09	0.49
DL-Isoleucine	lle	2.26	0.27
DL-Leucine	Leu	2.39	0.19
DL-Lysine	Lys	2.44	0.21
DL-1-Methylhistidine	1MH	2.94	0.26
DL-Methionine	Met	3.11	0.35
Nicotinamide	NAM	2.48	0.22
Niacin		ND	N/A
DL-Phenylalanine	Phe	2.44	0.25
DL-Proline	Pro	2.25	0.16
Sarcosine		2.29	0.69
DL-Serine	Ser	1.99	0.56
DL-Threonine	Thr	2.51	0.33
DL-Tryptophan	Trp	2.48	0.3
DL-Tyrosine	Tyr	2.62	0.24
DL-Valine	Val	2.36	0.21

Sample Label: PO A



Running Your Samples



Press **Start** to bring up the batch initialization checklist. All checklist items must be completed before analysis begins.

- Some errors (
) are automatically confirmed by REBEL
) once the user resolves the issue
- Actions with square checkboxes (□) must be manually confirmed by the user before continuing





Monitor Progress





Timeline

Queue

View batch in progress and what's up next

Test History

Select any batch sample to view quantitative results on screen

Queue				
ZC Wine Sequence 1	12 Samples	2h03m	Running	I
ZC Wine Sequence 2	12 Samples	2h03m	Next	
ZC Wine Sequence 3	12 Samples	2h03m	Next	
ZC Wine Sequence 4	12 Samples	2h03m	Next	I
Test Histor Show all ~ Date Rai	'Y nge ∨			
Today				
ZC Beer Sequence	64 Samples	4h35m		
ZC Beer Sequence	64 Samples	4h35m		
ZC Beer Sequence	64 Samples	4h35m	SELECT	
1.22.2019			3 Items 💙	
1.22.2019			3 Items 💙	
1.22.2019			3 Items 💙	
1.22.2019			3 Items 💙	
1.22.2019			3 Items 💙	
1.22.2019			3 Items >	
^ -	F		袋	

<	Batch Sum Exit Test	imary	
		QC100_B	2019-09-25T06:33:18
11.	LD5	QC50_B	2019-09-25T06:05:48
ı.		QC25_B	2019-09-25T05:38:20
11.	LB5	QC10_B	2019-09-25T05:10:54
11.	LA5	QC5_B	2019-09-25T04:43:28
11.	LB4	PQ_N	2019-09-25T04:16:01
11.	LA4	PQ_M	2019-09-25T03:48:36
11.		PQ_L	2019-09-25T03:21:09
11.		PQ_K	2019-09-25T02:53:42
11.	LD3	PQ_J	2019-09-25T02:26:16
1.	LC3	PQ_I	2019-09-25T01:58:49
11.	LB3	PQ_H	2019-09-25T01:31:23
ı.	LA3	PQ_G	2019-09-25T01:03:58
11		PQ_F	2019-09-25T00:36:31
11.		PQ_E	2019-09-25T00:09:05
ı.	LD2	PQ_D	2019-09-24T23:41:38
11.	LC2	PQ_C	2019-09-24T23:14:12
	A -	- 1	袋

<	Batch Su Exit Test	ummary t		
		QC100_B	2019-09-25T06:33:18	
1.	LD5	QC50_B	2019-09-25T06:05:48	
1.		QC25_B	2019-09-25T05:38:20	
11	LB5	QC10_B	2019-09-25T05:10:54	
ı.	LAS	QC5_B	2019-09-25T04:43:28	
	LB4	PQ_N	2019-09-25T04:16:01	
1	LA4	PQ_M	2019-09-25T03:48:36	
1		PQ_L	2019-09-25T03:21:09	
~		Sample Infor	rmation	
Analyi Ile Thr Me-Hi GABA Asp		LAS QC5_B 4 100 2019-09-25T04:43 0.6 0.6 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2	3-28 4 ± -4 0.02 -55 0.06 -57 0.06 -50 0.07	
1	A	+	■ 袋	



Manage a Batch in Queue

- To stop a batch run, select "Stop" on the home screen
 Batch will pause after all replicates of the current sample are complete
- To resume the batch run, select "Start" on the home screen



 To remove a batch from Queue, select the trash icon ()

Rebel Service 🔹	3:57 PM		STOPPING	ψ		Rebel Service +	3:49 PM		STOPPED	ψ
Queue						Delete Item Are you sure y	ou want to remov	/e		
Media Comparison		1 Sample	Running	Û		this batch from	n the queue?		res	NO
RF2	PQ									
Media Comparison		32 Sample	es Next	Î			Med199_01			
RF2	PQ					LA2	Med199_02			
LAI	Med199_01						Med199_03			
Ratch Hist	orv					Ratch Hi	story			
Today	lor y		2 Items	、 、	Ter		story		1 Items	
loday					100	lay				
6/2/2022			1 Items	>	6/2	2/2022			1 Items	>
6/1/2022			2 Items		6/1	/2022			2 Items	
5/29/2022			4 Items		5/2	29/2022			4 Items	
5/17/2022			1 Items		5/1	7/2022			1 Items	
5/16/2022			2 Items		5/1	6/2022			2 Items	
5/13/2022			1 Items		5/1	3/2022			1 Items	
5/12/2022			2 Items		5/1	2/2022			2 Items	
5/11/2022			1 Items	>	5/1	1/2022			1 Items	
5/10/2022			4 Items		5/1	0/2022			4 Items	
E (0 (2022					E //	ררחרי ו				
A	+		ŝ	\$		A	+	\equiv	ž	523



Reviewing Results



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Reviewing Results

Results are available in several convenient report formats. See <u>page 24</u> for more information on changing report settings.

Spent Media Analysis Sample Label: Day4_BR6 User: KGE		REBEL	Spent Media Analysi Sample Label: Day4_BR6 User: KGE	s	7	EBEL	Spent Medi Sample Lat User: KGE	a Analysis Iel: Day4_BR6	REBEL
LAA4 SP ST ST ST ST ST ST ST ST ST ST ST ST ST	ent Media Ana nple Label: Di te Completed: 12 ution Factor: 20 (B (DAY 4) 222.05.14 222.05.14	nlysis: avf_BR6 1:17 202.06.14 00X (included in results)	LAA4 S Satch Label: Rebet Chop 5/N: Comment: Last R0 Result: Last Caluration: Pass 11:32 Pass 11:32	pent Media mple Label: ne Completed lution Factor: 28 (DAY 4) : 2y 1022.05.14 1022.05.14	la Analysis Day4_BR id: 12:17 20 : 200X (inc	s 22.06.14 Juded in results)	Batch I Rebel C Comme Last P Last Ca	A4 abel: Time hip 5/N: nt: Result: Pass libration: Pass	Spent Media Analysis: Sample Label: Dyd. B86 Time Complex Technic Tech
Analyte	mM ±		Analyte	mM			00	Evet	racted Ion Electronhorograms
DL-isoleucine (ile)	1.1 1.4%	•	DL-Alanyl-DL-Glutamine (AQ)	ND	ND			CAU	acted for clech opherograms
DL-Leucine (Leu)	2.0 4.6%	-	DL-Alanine (Ala)	2.6	1.5%				11
DL-Lysine (Lys)	5.0 2.1%		DL-β-Alanine (βAla)	1.1	2.1%		-		
DL-1-Methylhistidine (1MH)	ND ND		DL-Arginine (Arg)	4.2	5.2%				· · · ·
DL-Methionine (Met)	1.1 2.8%	-	DL-Asparagine (Asn)	4.7	4.7%		ť		
Nicotinamide (NAM)	ND ND		DL-Aspartic acid (Asp)	8.8	4.0%		Ě,		
DL-Phenylalanine (Phe)	0.6 1.3%	•	Thiamine (B1)	ND	ND		D C		
DL-Proline (Pro)	1.2 3.5%	-	Pyridoxine (B6-OH)	ND	ND		¥ .		
Sarcosine	ND ND		Pyridoxal (B6-Oxo)	ND	ND				
DL-Serine (Ser)	6.0 2.8%		Choline	ND	ND		1		
DL-Threonine (Thr)	2.1 1.8%	-	DL-Citrulline (Cit)	ND	ND				
DL-Tryptophan (Trp)	0.5 1.3%		DL-Cystine (Cystine)	ND	ND				6 01 12 13 19 19 19 19 19 19 19 19 19 19 19 19 19
DL-Tyrosine (Tyr)	0.6 1.7%	•	γ-Aminobutyric acid (GABA)	ND	ND		Analytes: (1151, (2) (Alia, (3) Lus, (4) GA	8A, (5) Arg. (6) His. (7) IS2, (8) Gb, (9) Aia, (10) Val. (11) Be, (12) Less (13) Ser. (14) Thr.
DL-Valine (Val)	2.3 1.6%		DL-Glutamine (Gin)	1.5	1.1%		(15) Met, (1	6) Asn, (17) Pro. (18) Phe. (19	(Gin, (20) Giu, (21) Trp. (22) IS3, (23) Tyr. (24) Asp. (25) IS4, (26) Hyp.
			DL-Glutamic acid (Glu)	3.6	2.1%				
			DL-Glutamine and DL-Glutamic acid (Glx)	5.1	2.7%				
			Glycine (Gly)	1.8	1.5%				
			DL-Histidine (His)	1.7	2.0%				
			DL-Hydroxyproline (Hyp)	0.6	2.3%				
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**908devices	Support:	help@908devices.com +1.844.908.4357	×908devices	Su	upport: help@9	08devices.com +1.844.908.4357	*908devices		Support: help@908devices.com +1.844.908.4357

Did the REBEL report an expected target out of range?

✓ If over the LOQ (>LOQ), dilute further and run again.
 ✓ If not detected (ND), re-dilute based on data and run again.

DL-Cystine (Cystine)	>LOQ	N/A	
y-Aminobutyric acid (GABA)	1.7	0.7	
DL-Glutamine (Gln)	2.7	0.9	
DL-Glutamic acid (Glu)	1.8	0.6	
DL-Glutamine and DL-Glutamic acid (Glx)	4.5	1.1	
Glycine (Gly)	ND	ND	

Now Available: JMP Add-In

• For easy data visualization, ask your 908 Devices representative about our add-in for the popular statistical software JMP.



jmp

Routine Maintenance and Calibration



Routine Checks and Maintenance

, Tips f

Tips for keeping your REBEL in optimal working order

- A full shutdown should be performed if the REBEL will be idle for more than five (5) days. If the REBEL is coming back online from a complete shutdown, it is recommended to perform a Self Test (see pages <u>37–38</u>) followed by a Quantitative Calibration (see page <u>14</u>).
- A single PQ can also be run before beginning a new batch to ensure your REBEL device is still quantifying analytes within calibrated bounds. See <u>page 14–16</u>, for more information about Quantitative Calibration and Performance Qualification.

Daily

Check and empty the condensate tray. The amount of daily condensate will vary depending on environmental conditions.

Weekly

- Wipe away dust and debris in immediate area (~1 foot) on each side of the REBEL base with a clean, lint-free cloth dampened with water.
- Check consumable levels and replace if expired (see <u>page 12</u> for more information on setting up the consumables kit).
- Run a self-test if the system is coming back online after:
 - o a long-term shutdown, or
 - o if the system has remained online for five days or more.







System Status

The REBEL unit will let you know if you need to refresh consumables or empty waste.

To check-in, select System Settings > System Status

This menu will alert you if you need to:

- replace the chip
- refresh BGE supply
- refresh REBEL standards
- empty waste bottle or condensate tray

Mark -	11:47 AM SMA VZ STOPPED 🜵
System S	ettings
Jystein J	
	Supplies:
🛆 System Status	Chip Replace Replace
🕰 User Accounts	100 samples remaining
🔝 Storage / Export	Last replaced: 100% remaining 2025-02-13 30 days until expiration
🚊 Network	Standards SMA V2
🖏 Maintenance	2025-02-13 Reptace
🎦 Tools	14 days until expiration Waste Materials:
♠ Support	Waste Bottle Condensate Tray
 System Info 	
😃 Shut Down Rebel	Empty
	Operating Parameters:
	Sample Temperature: 21.5°C (disabled) System Temperature: 28.7°C
	Last QC: N/A
	Camera
↑	+ ≅ ¢



System Status: Consumables

The REBEL unit will alert you when the chip is approaching or reaches 200 runs, or BGE or Standard solutions levels are low. Follow the on-screen prompts to the System Status screen and press "**Replace**" for further instruction before opening the REBEL door.

Chip

- Select "Replace" to expose old chip
- Remove old chip and load up a fresh one from your new REBEL kit

Note: Each REBEL chip is rated for 200 runs/replicates; Quantitative Calibration & Performance Qualification (PQ) runs do not add to this count. It is recommended to use a fresh chip after 60 days, regardless of runs remaining.

Background Electrolytes (BGE)

• Select "Replace" and follow on-screen prompt or confirm proactive swap







Standards

• Select "Replace" and follow prompts or confirm proactive swap

Note: REBEL will not detect new standards. Runs are tracked on standards to ensure sufficient volumes for sample loading. Each Standards strip is rated for 24 PQs.





System Status: Waste Tracking

Waste Bottle

The REBEL unit will also alert you when the waste bottle is full. Follow the on-screen prompts when replacing or performing a proactive swap.





Condensate Tray

The REBEL unit also alerts you when the condensate tray reaches 50% capacity or is full. To empty this tray:

- Open REBEL door
- Pull recessed handle under front bottom to remove tray
- Dispose of the liquid
- Use a Kimwipe to dry the metal contact pins in the tray
- Re-secure tray in REBEL and close door.





Advanced Diagnostics

These advanced diagnostics may be necessary if requested by the 908 Devices support team. Navigate to **System Settings > Maintenance.**

Self-Test

System Rinse

placed in the chip carrier.

waste bottles are installed.

Self-Test

This function runs basic system functions to determine overall system health.

System Rinse

Run System Rinse if requested by 908 Devices support. This step flushes the system fluidics from the lines.

Export Service Reports

Tools > Diagnostics > Export Service Reports Export Service Reports to a USB drive or network storage location for the 908 Devices support team. Service Reports do not include any data from user samples, only system, calibration, and other diagnostic information.



To run the hardware Self-Test, ensure that a Rebel Chip is

Use only if recommended by Rebel Support. This option

rinses the system with BGE. To proceed, ensure that a Rebel Chip is placed in the chip carrier, and the BGE and



Advanced Diagnostics: Self Test

Self-Test

This function runs basic system functions to determine overall system health. To access, navigate to **System Settings > Maintenance.** Several conditions identified by the Self-Test can be resolved by the user. If errors persist or parameters remain out of specification, please contact 908 Devices Customer Support.

Pump RPM/Difference Vacuum Pressure

These tests are related to the detector's vacuum system. If Pump RPMs are too low, attempt the "Clear Aperture Inlet" function in the Maintenance menu.

20kV Supply Current 20kV Supply Voltage 5kV Supply Voltage

These values are related to high voltages for capillary electrophoresis (CE) separation. If out of specification, restart system and reattempt Self-Test.

Pneumatic Pressure Pressure Drop/Recovery

These values are related to the gas system and pressure sealing on the chip during analysis. If out of specification, remove chip and adapter plate. Make sure O-rings are on adapter plate. Reattempt Self-Test.

• Trapping Voltage, Ramp Voltage

These tests are related to the high-pressure mass spectrometry (HPMS) detector. If out of specification, attempt to run Quantitative Calibration. The calibration process should tune these parameters.





Shutdown

Navigate to System Settings > Shut Down REBEL

Power Cycle should be used when prompted by the REBEL unit or 908 Devices Support.

Full REBEL Shutdown should be performed if the REBEL will be idle for more than five days. Follow on-screen prompts to complete this 30-minute procedure to ensure proper function.

- Remove BGE and cap bottle
- Place empty bottle under BGE line for cleanliness during dry cycle
- Sample tray cooler will power down, so remove vials/plates from BOTH left & right trays and refrigerate.
- AFTER shutdown, empty the waste bottle and condensate tray
- Manually toggle power switch OFF





System Information and Networking



System Info

Navigate to System Settings > System Info

- REBEL Serial Number (S/N)
- Software version
- Technical support

System Status System Status Storage / Export Storage / Export Storage / Export Naturenance Support Support System Info Suptom Rebel



Networking & Storage—For IT Reference



REBEL is an embedded system running a captive application on a background Windows 10 Enterprise OS.

The system can run stand-alone or on a network (ethernet) connection.

No external internet connection is required.

Tip: A complete Networking Guide is available on Customer Service Portal

Network Configurations

- 1. None—run standalone with USB-only data access
- 2. Static IP
- 3. DHCP

Press **Apply** to commit any changes to these settings

Storage Options

Internal storage

• Considered temporary for 21CFRpt11 purposes

Network storage

- Write Location: Path where data will be saved
- *Read Location*: Path where batch runsheets will be read



Internal Storage



Network Storage





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Storage Status Icons



Internal Storage Configured

REBEL is ready to run in this mode.

Network Storage Configured REBEL is ready to run in this mode.

Files Syncing REBEL has files stored locally that are transferring to the network.

Network Locations Unreachable

REBEL is configured for network storage, but the read / write directory is not accessible.

Files Queued for Export

REBEL has files stored internally that will be sent to the network when the connection is reachable before a new batch begins.





Read/Write Access & File Types





We're Here to Help!



Stay connected!

help@908devices.com for service and assistance

<u>rebel@908devices.com</u> for consumable and service plan information & purchases

Check out our blog and social media for the latest tips and more <u>908devices.com/blog</u>





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Join us any time on our customer support portal to see helpful docs, tutorial videos, and more!

- Batch sheet template
- Guide to Pivot Tables
- Networking Guides
- Vial & Plate Recommendations
- Quick Reference Guide
- Software updates

Appendix



Laminar Flow Cabinet Recommendations

Depending on your laboratory conditions, you may have a laminar flow cabinet for your REBEL setup. The Purair FLOW Laminar Flow Cabinet was manufactured by Air Science with custom filter configuration (charcoal + HEPA dual filtration) and pre-conditioned to meet 908 Devices requirements for use with the REBEL platform.

Usage Recommendations

- Turn on laminar flow cabinet and allow it to run for at least 1 hour before running REBEL.
 Tip: for best results, leave the laminar flow cabinet running overnight before running REBEL.
- Leave laminar flow cabinet on while REBEL is on.
- □ Always ensure 2" (5cm) clearance between the back of the REBEL unit and the back of the laminar flow cabinet to ensure proper airflow into the REBEL unit.







Precautions for Safe Use / Warnings



Safety features have been incorporated in the design, but for continued safety, only trained personnel are allowed access to the equipment. Make sure that covers and doors are closed before starting the REBEL. Return the equipment to the manufacturer for all servicing. Damage to the device may result from improper use.

This equipment must be lifted and carried by two or three people, or a lifting device will be required (product weight: 38 kg / 84 lbs).

This equipment is designed to be operable in pollution degree 2 environments that may have non-conductive pollution that might temporarily become conductive due to occasional condensation.



The end-user shall determine what personal protective equipment (PPE) is required per existing standard operating procedures and use standard protocols for chemicals and other potential hazardous materials.

Verify waste line from REBEL is routed into the on-board waste bottle and dispose of waste stream, including spillage and overflow, in accordance with local laws. Verify waste bottle is empty before use and dispose of waste in accordance with local laws.



Precautions for Safe Use / Warnings



The system must be connected to a suitable mains power supply with a correctly installed protective earth conductor. Removal of panels may expose users to high voltages. For that reason, this should only be done by qualified service personnel. Disconnect the system from the mains power supply by removing the mains power cord before removing protective panels. Replace or repair damaged mains power cords immediately.

Replace blown fuses only with types as indicated in the specification. User replaceable fuses located on the AC input module (rear) are 250VAC, 3.15A (LittleFuse 02153.15MXH). The internal fuse is not user accessible. Return to manufacturer for repair.

Protective earthing required (3-wire power supply cord, for connection to an earthed Mains socket-outlet). Only the manufacturer-supplied 3 wire grounded AC cord is to be connected to the AC inlet on the device. Replacing detachable mains supply cord with inadequately rated cords is prohibited. Equipment must be positioned with power cord accessible for easy disconnection from the power outlet/inlet.



This equipment contains a 532 nm, 5 mW Class 3R laser diode with a beam divergence of <1.2 mrad but is classified as a Class 1 Laser Product as an end-use product as evaluated to IEC 60825-1:2014. Avoid direct eye exposure to the beam and do not remove the laser for any other purpose.



REBEL is intended to be used for Research Use Only (RUO), and not for use in Diagnostic procedures.

United States of America Federal Communication Commission

This equipment has been tested and found to comply with Part 18 of the FCC Rules.

Safety

This apparatus is tested and found to comply with Safety Requirements pursuant to standard UL 61010-1 "Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use - Part 1: General Requirements" *Federal Drug Administration*

This device contains a Class 1 Laser that has been tested and found to comply with CFR Title 21, Chapter I, Subchapter J, Part 1040.10

Japan

Electromagnetic Compatibility

This device has been tested and found comply with Japanese standard JIS C 61326-1:2017 "Electrical equipment for measurement, control and laboratory use. EMC requirements. General requirements" *Safety*

This apparatus is tested and found to comply with Safety Requirements pursuant to standard EN 61010-1 "Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use - Part 1: General Requirements" This device contains a Class 1 Laser that has been tested and found to comply with Japanese standard JIS C 6802:2014 "Safety of laser products - Part 1: Equipment classification and requirements"

For biosafety-related information and biohazard evaluation, please inquire with 908 Devices customer service.

European Union Electromagnetic Compatibility

This device has been tested and found comply with standard EN 61326-1:2013 "Electrical equipment for measurement, control and laboratory use. EMC requirements. General requirements".

Safety

This apparatus is tested and found to comply with Safety Requirements pursuant to standard EN 61010-1 "Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use - Part 1: General Requirements" This device contains a Class 1 Laser that has been test and found to comply with standard EN 60825-1 "Safety of laser products - Part 1: Equipment classification and requirements"

Republic of Korea

Electromagnetic Compatibility

This device has been tested and found to comply with Korean standard KS C IEC 61326-1:2008 Electrical equipment for measurement, control and laboratory use. EMC requirements. General requirements"

Safety

This apparatus is tested and found to comply with Safety Requirements pursuant to Korean standard K 61010-1:2010 Safety Requirements for Electrical Equipment for

Measurement, Control, and Laboratory Use - Part 1: General Requirements"

This device contains a Class 1 Laser that has been tested and found to comply with Japanese standard KS C IEC 60825-1:2013 "Safety of laser products -Part 1: Equipment classification and requirements"

This product has an affixed label with following information:

- Manufacturing name
- Product and model name
- Country of origin
- KC Mark logo and KC (MSIP) number



Warranty

Your REBEL, associated REBEL Chips, and associated consumables rely on a range of patented or patentpending technologies: <u>www.908devices.com/patents/</u>

WARRANTY. Seller warrants that the Products will operate or perform substantially in conformance with Seller's published specifications and be free from defects in material and workmanship, when subjected to normal, proper and intended usage by properly trained personnel, for the period of time set forth in the Seller's quote, for Products, or if none indicated then as specified in Seller's product documentation, published specifications or package inserts. If a period of time is not specified in Seller's quote, product documentation, published specifications or package inserts, the warranty period shall be one (1) year from the date of shipment to Buyer for equipment, and the greater of four (4) months from date of manufacture or three (3) months from receipt of the consumable kit (the "Warranty Period"). Seller agrees during the Warranty Period, to repair or replace, at Seller's option, defective Products so as to cause the same to operate in substantial conformance with said published specifications; provided that Buyer shall (a) promptly notify Seller in writing upon the discovery of any defect, which notice shall include the product model and serial number (if applicable) and details of the warranty claim; and (b) after Seller's review, Seller will provide Buyer with service data and/or a Return Material Authorization ("RMA"), which may include biohazard decontamination procedures and other product-specific handling instructions, then, if applicable, Buyer may return the defective Products to Seller with all costs prepaid by Buyer. Replacement parts may be new or refurbished, at the election of Seller. All replaced parts shall become the property of Seller. Shipment to Buyer of repaired or replacement Products shall be made in accordance with the Delivery provisions of the Seller's Terms and Conditions of Sale.

Notwithstanding the foregoing, Products supplied by Seller that are obtained by Seller from an original manufacturer or third party supplier are not warranted by Seller, but Seller agrees to assign to Buyer any warranty rights in such Product that Seller may have from the original manufacturer or third party supplier, to the extent such assignment is allowed by such original manufacturer or third party supplier.

In no event shall Seller have any obligation to make repairs, replacements or corrections required, in whole or in part, as the result of (i) normal wear and tear, (ii) accident, disaster or event of force majeure, (iii) misuse, fault or negligence of or by Buyer, (iv) use of the Products in a manner for which they were not designed, (v) causes external to the Products such as, but not limited to, power failure or electrical power surges, (vi) improper storage and handling of the Products or (vii) use of the Products in combination with equipment or software not supplied by Seller. If Seller determines that Products for which Buyer has requested warranty services are not covered by the warranty hereunder. Buyer shall pay or reimburse Seller for all costs of investigating and responding to such request at Seller's then prevailing time and materials rates. If Seller provides repair services or replacement parts that are not covered by this warranty, Buyer shall pay Seller therefor at Seller's then prevailing time and materials rates. ANY INSTALLATION, MAINTENANCE, REPAIR, SERVICE, RELOCATION OR ALTERATION TO OR OF, OR OTHER TAMPERING WITH, THE PRODUCTS PERFORMED BY ANY PERSON OR ENTITY OTHER THAN SELLER WITHOUT SELLER'S PRIOR WRITTEN APPROVAL. OR ANY USE OF REPLACEMENT PARTS NOT SUPPLIED BY SELLER. SHALL IMMEDIATELY VOID AND CANCEL ALL WARRANTIES WITH RESPECT TO THE AFFECTED PRODUCTS. THE OBLIGATIONS CREATED BY THIS WARRANTY STATEMENT TO REPAIR OR REPLACE A DEFECTIVE PRODUCT SHALL BE THE SOLE REMEDY OF BUYER IN THE EVENT OF A DEFECTIVE PRODUCT. EXCEPT AS EXPRESSLY PROVIDED IN THIS WARRANTY STATEMENT, SELLER DISCLAIMS ALL OTHER WARRANTIES, WHETHER EXPRESS OR IMPLIED, ORAL OR WRITTEN, WITH RESPECT TO THE PRODUCTS. INCLUDING WITHOUT LIMITATION ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE. SELLER DOES NOT WARRANT THAT THE PRODUCTS ARE ERROR-FREE OR WILL ACCOMPLISH ANY PARTICULAR RESULT.

All components shall be disposed of properly, as required by local authorities and jurisdictions.



REBEL

The REBEL platform is a Capillary Electrophoresis (CE)-Electrospray Ionization (ESI) source integrated with a mass analyzer based on high-pressure mass spectrometry (HPMS). REBEL is designed for life science applications including detection of analytes in spent cell culture media. REBEL is designed only to detect analytes loaded in the deployed library.

> Manufactured by: 908 Devices Inc. 645 Summer St. Boston, MA 02210

www.908devices.com

Support: help@908devices.com Sales: rebel@908devices.com +1.844.908.4357

