

H3 GrainGage

NIR Technology

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USA

BUILT
FOR YOU LIKE



EFFICIENCY MEETS ACCURACY.

THE NEXT-GENERATION OF GRAINGAGE™

The new H3 GrainGage™ by HarvestMaster includes world-class SCiO™ near infrared (NIR) technology, creating the first fully integrated, on-combine NIR harvest data collection system. The H3 GrainGage™ offers various constituent predictions from ready to use calibrations for many crops with more coming in the future. Custom calibrations can be developed, and we take care of updating and maintaining all calibrations for you every year.

Also available is the new H2 NIR Upgrade Kit, which allows any H2 GrainGage to be converted to an H3 on location with a few simple modifications.

A solution like this has never been available until now. No more bagging and shipping samples for offsite NIR analysis. Get the data you need right in the field, all for a fraction of the cost of other on-combine NIR options. Save months of effort each harvest season, reduce the risk of unorganized/unusable data, reduce calibration efforts, and get the on-combine, fully integrated NIR solution the industry has been missing.

 **HarvestMaster.**
BY JUNIPER SYSTEMS

GrainGages™

H3 NIR Technology

HarvestMaster is the leader in research agriculture technologies. We have continually brought new data collection equipment and software to researchers everywhere. Our innovations include the Classic GrainGage, High Capacity GrainGage, H2 GrainGages, Mirus Harvest Software, and now on-combine NIR Technology with the H3 GrainGage.

GRAINGAGE	H3 CLASSIC	H3 HIGH CAPACITY SINGLE	H3 HIGH CAPACITY TWIN
Weight	68 lbs (30.8 kg)	116 lbs (52.6 kg)	218 lbs (98.9 kg)
Dimensions	15" w x 18" d x 19" h (38 cm x 46 cm x 48 cm)	23" w x 25" d x 22" h (58.42 cm x 63.5 cm x 55.88 cm)	23" w x 27" d x 42" h (58.42 cm x 68.58 cm x 106.68 cm)
Weigh Hopper Volume ¹	0.57 US Bu (20 L)	1.53 US Bu (54 L)	1.53 US Bu (54 L)
Twin Hopper Volume ¹	N/A	N/A	1.11 US Bu (39 L) Full, 0.82 US Bu (29 L) to top of level detects
Cycle Speed ²	9 seconds	9 seconds	18 seconds

GENERAL INFORMATION

Test Chamber Volume (0 Insert): SCiO Sensor / EM3 Sensor	2.2 L / 2.5 L
Test Chamber Volume (1 Insert): SCiO Sensor / EM3 Sensor	1.7 L / 2 L
Test Chamber Volume (2 Insert): SCiO Sensor / EM3 Sensor	NA / 1.5 L
Voltage Requirement	11.5 - 18V DC
Air Pressure Requirement	75-90 psi (517 kPa to 621 kPa)
Storage Temperature	-22°F to 140°F (-30°C to 60°C)
Operating Temperature	33°F to 122°F (1°C to 50°C)
Temperature Compensation	Yes
Slope and Motion Compensation	Yes
Plot Weight ³	± 0.1 lbs (± 45 g)
Test Weight ³	± 0.8 lb/bu (± 1 kg/hl)
M2.0 Moisture (EM3 Sensor) ^{3,4}	±0.5% for 0% to 27% moisture; ±1.0% for 27% to 40% moisture

COMPUTER REQUIREMENTS

Operating System	Windows 8 or higher, 32 or 64-bit OS
Processor Speed	2.0 GHz Dual Core
Memory	4 GB minimum
Data Storage	500 MB available disk space
Display Resolution	1280 x 800 minimum
Software	Mirus 4.4.0 or higher, SDK available
Plugin	H3 Plugin required
Calibration	Calibration program required

SCiO NIR SENSOR

Sensor type	Silicon
Illumination	Incandescent Bulb, 6.3V 200mA (eye safe)
Spectrometer wavelength range	750 - 1,070 nm
Spectrum sampling	1 nm
Optical resolution (average)	6 nm
Glass Dome Material	Hand-blown Borosilicate
Glass Dome sample exposure	26 in ²
Glass Dome volume	0.25 L
Housing Material	TR-90

¹ For hopper weight capacity use the following formula: Test Weight [lb/bu] x Hopper Volume [L] x 0.028 = lbs

² Dependent on computer performance

³ Dependent on proper calibration

⁴ SCiO and EM3 Sensor cannot be installed at same time

⁵ RMSE: Root-Mean-Square-Error is an estimator for the standard deviation of the error distribution. In other words, 68.2% of the errors ([-1σ,+1σ]) are expected to be within the RMSE value. 95.4% of the errors ([-2σ,+2σ]) are expected to be within 2 RMSE value

⁶ Soybean protein and oil is on a 13% moisture basis

⁷ Wheat protein is on a 12% moisture basis

⁸ Barley protein is on a dry matter basis

Minimum required test chamber weight (lbs) including 20% head room

Crop: lb/bu	SCiO Sensor: 0/1 insert	EM3 Sensor: 0/1/2 inserts
Wheat: 60	4.5 / 3.5	5.1 / 4.1 / 3.1
Canola: 47	3.5 / 2.7	4.0 / 3.2 / 2.4
Soybean: 55	4.1 / 3.2	4.7 / 3.7 / 2.8
Barley: 48	3.6 / 2.8	4.1 / 3.3 / 2.5
Corn: 56	4.2 / 3.2	4.8 / 3.8 / 2.9
Rye: 56	4.2 / 3.2	4.8 / 3.8 / 2.9
Sorghum: 56	4.2 / 3.2	4.8 / 3.8 / 2.9
Oats: 32	2.4 / 1.9	2.7 / 2.2 / 1.6
Sunflower: 25	1.9 / 1.4	2.1 / 1.7 / 1.3

SCiO CALIBRATIONS

Material	Constituent	Range (%)	RMSE ⁵ (%)	Temp (°C / °F)
Soybean	Moisture	6-24	0.35	1-50 / 33-120
	Protein ⁶	29-40	0.5	1-50 / 33-120
	Oil ⁶	16.5-25	0.4	1-50 / 33-120
Corn	Moisture	6-36	0.58	1-50 / 33-120
Wheat	Moisture	5-19	0.42	1-40 / 33-105
	Protein ⁷	7.5-18	0.45	1-40 / 33-105
Barley	Moisture	10-15	0.24	1-45 / 33-115
	Protein ⁸	9-15	0.46	1-45 / 33-115

