



Liquid Systems (SA)
McIntosh Distribution
Product Specifications

Version: AUGUST 2013

Liquid Systems (SA)
Unit 3/3 Selgar Ave Clovelly Park SA 5042 Australia
Ph: +61 8 8357 4437 Fax: +61 8 8357 4537
Email (Australia): contact@liquidsystems.com.au
www.liquidsystems.com.au

Contents

Morris Rate Control Modules	3
Morris Gen 4	4
Spiker	6
Options	8
Wiring / Electronics	
Greenstar Looms	9
TOPCON Looms	12
Ag Leader Looms	13
Trimble Looms	15
Stacker Distribution Systems	17
Line Meter Selection	18
Standard Air Tool Manifold Configurations	19
Section Control Air Tool Manifold Configurations	20
Air Tool Terminal Configurations	21
Check Valve Boot	23

McIntosh Distribution Rate Control Modules

The following table compares main features of the McIntosh Distribution rate control modules. Further details on each module appear on the following pages.

	SINGLE LIQUID	DUAL LIQUID	NORMAL OUTPUT Max 76LPM 20GPM (US)	HIGH OUTPUT Max 126LPM 33GPM (US)	LOW RATE DOSING Max 24LPM 6GPM (US)	SECTION CONTROL COMPATIBLE
Morris Gen 4	✓			✓		✓
SPIKER	✓				✓	

MAX OUTPUT REQUIREMENTS CALCULATION

Use the following equations to calculate the maximum output required.

METRIC	OUTPUT = $(W \times S_{max} \times R_{max}) / 600$ LPM (litres per minute)
	<p>W = effective implement width in metres</p> <p>S_{max} = maximum sowing/planting speed in km/h</p> <p>R_{max} = maximum liquid application rate in L/Ha</p>
US	OUTPUT = $(W \times S_{max} \times R_{max}) / 495$ US Ga/min (gallons per minute)
	<p>W = effective implement width in feet</p> <p>S_{max} = maximum sowing/planting speed in MPH</p> <p>R_{max} = maximum liquid application rate in Ga/Acre (US)</p>

Morris Gen 4

ORDER CODE:
LQS-MORRIS-GEN4



Product Description

The MORRIS GEN 4 is a single liquid auto-rate pump and control module. It offers a powerful 126 L/min (33 Ga/min) LQS Enhanced piston diaphragm pump. This provides capacity for applying liquids at higher rates or with increased tank agitation.

SPECIFICATIONS	
Function	High Volume Single liquid rate control
Max. Output	126 L/min 33 Ga/min (US) 27.7 Ga/min (Imperial)
Dimensions	W 900mm x D 890mm x H 760mm
Weight	108kg (module only)
Pump	Hydraulically driven 126 L/min (33 US Ga/min) LQS Enhanced piston diaphragm pump
Hydraulics	27.5 L/min 7.3 Ga/min (US) 6.0 Ga/min (Imperial)
Electrical	12V 1.3A
Features	<ul style="list-style-type: none"> factory wet tested precision valve set incorporating TeeJet ball valves and flow meter digital pump speed readout pressure transducer and module mounted pressure gauge suction filter fertiliser/ clean water source selection purge function

SPECIFICATIONS

Morris Gen 4 Features Cont.

- all Morris Gen 4 tank plumbing included and umbilical line to connect to Stacker distribution system (See Below)

Suction Lines X 2



Servo Bypass Line



PRV Dump Line



Purge Line



Umbilical Line



Agitation Kit



SPIKER

ORDER CODE: LQS-SPK



Product Description

The Spiker EVI dosing system has been designed for incorporating high viscosity fluids, such as trace elements, fungicides or soil wetters at very low rates into the main liquid delivery line.

Farmers can avoid costly spraying regimes by delivering these products into the furrow when planting. Spiker EVI removes the need for pre mixing of chemicals in the product tank which can be both wasteful and inflexible and can create issues due to chemical incompatibilities.

Compared to mechanical proportional dosing devices, Spiker EVI allows for the application rate of the dosing chemical to be completely independent of the rate of the main carrier liquid. This provides the farmer with far greater flexibility and control.

Spiker integrates with Greenstar™ and can be used with mapping based variable rate control for true prescription planting.

SPECIFICATIONS	
Function	Low Volume single liquid dosing. Inject at low rates into output line of MORRIS GEN 4. Ideal for micronutrients, fungicides, inoculants, soil wetters etc...
Max. Output	20 L/min 5.3 Ga/min (US) 4.4 Ga/min (Imperial)
Dimensions	W 575mm x D 620mm x H 580mm
Weight	50kg (module only)
Pump	Hydraulically driven 24 L/min (US Ga/min) LQS Enhanced piston diaphragm pump
Hydraulics	21 L/min 5.5 Ga/min (US) 4.6 Ga/min (Imperial)
Electrical	12V 1.3A
Features	<ul style="list-style-type: none"> factory wet tested digital pump speed readout suction filter fertiliser/ clean water source selection purge function output line with venturi connection to main carrier liquid line independent rate control of dosing liquid into carrier liquid for trace elements, fungicides, etc... maintain control at very low rates with flow meter accuracy down to 0.5L/min (17oz/min) can be hydraulically driven in series with other Liquid Systems pump & control modules built from chemical resistant materials and components stainless steel cabinet, mountings and fasteners

SPECIFICATIONS

Spiker Features Cont.

- full Spiker tank plumbing kit included. (See Below)

Suction Line



Servo Bypass Line



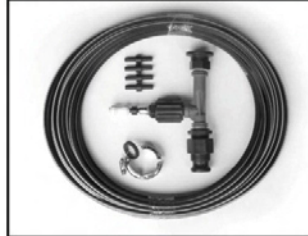
Purge Line



Suction Drain Kit



Venturi Induction Kit



Tank Agitation Kit



OPTIONS

Fill Fascia 600 Series

ORDER CODE: LQS-600-FF

This fill fascia provides fill ports for a liquid product tank and a clean water flush tank and a hand wash tap.



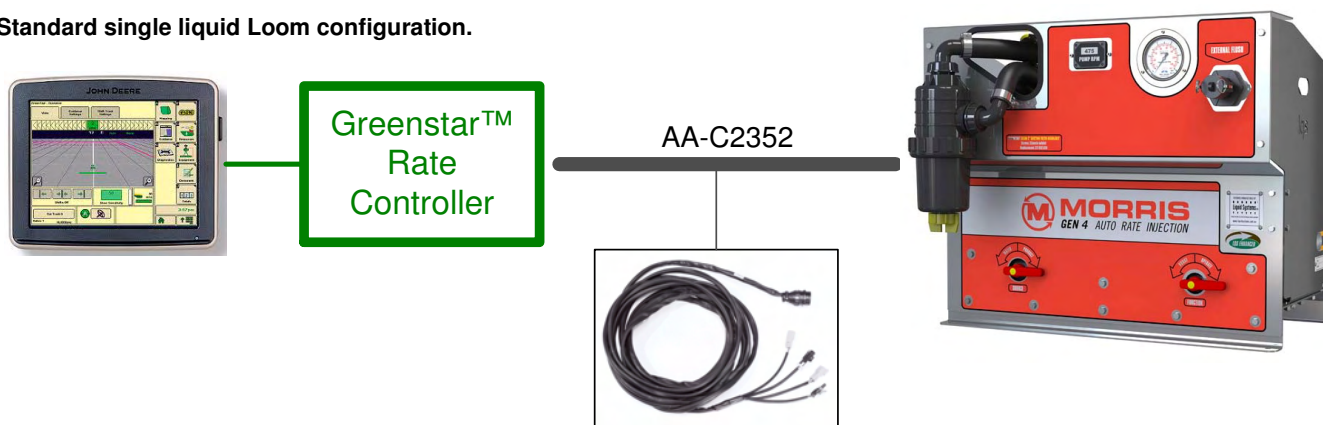
GREENSTAR™ LOOMS

Liquid Systems (SA) has a range of wiring Looms for integration with Greenstar™ Rate Controllers. This allows liquid application to be controlled from a Greenstar™ Display.

Standard

Order Code	Product	Description
AA-C2352	Greenstar Rate Controller Loom (10m)	Standard Rate Controller Loom to control one liquid channel. I.e. MORRIS GEN 4 and Spiker require one Loom each.

Standard single liquid Loom configuration.



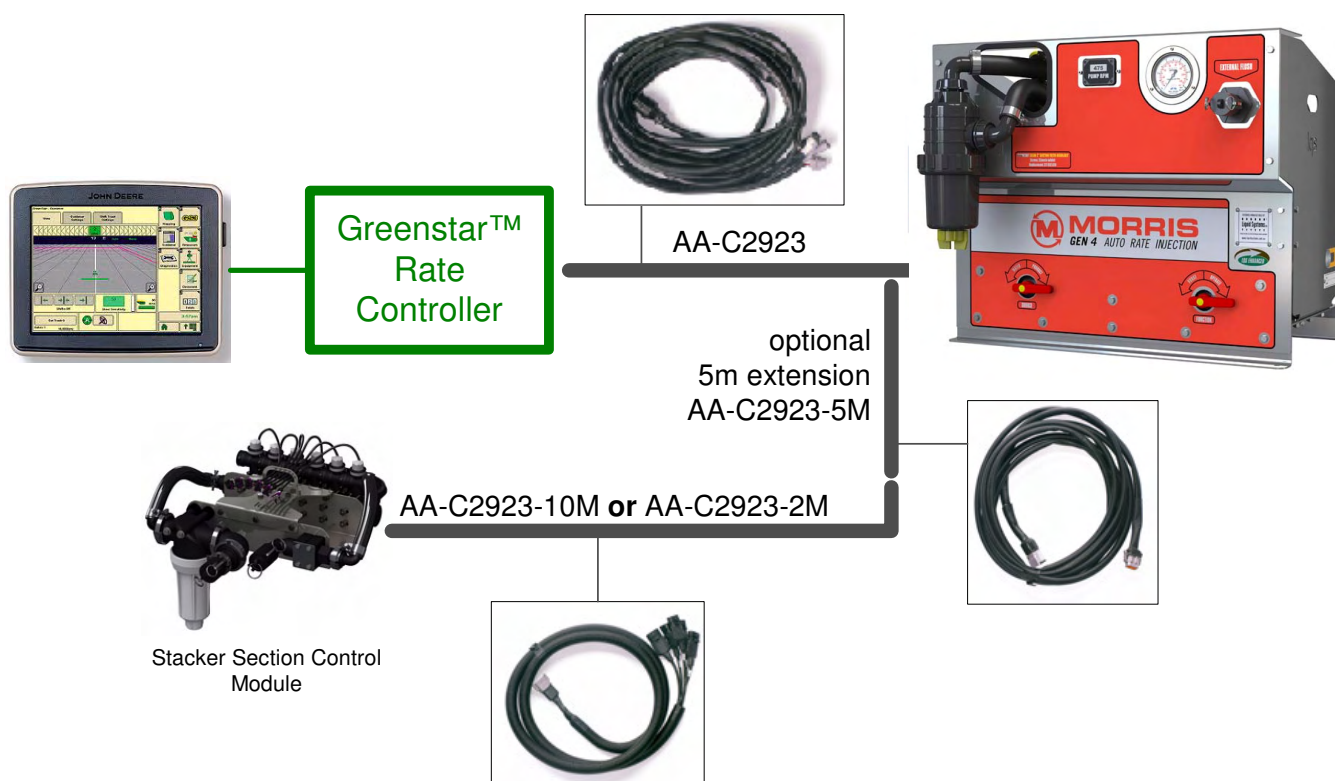
GREENSTAR™ LOOMS

Section Control – 2 to 6 Sections

The following Looms for implementing section control with up to 6 sections are currently available. The table and diagram below provide information to assist in ordering. Order Section Control Looms with a Section Control Stacker configuration and a Rate Control module. Swath Control Pro must be enabled in Greenstar™.

Order Code	Product	Description	Order when?
AA-C2923	Greenstar Section Control Compatible Loom (10m) 2 – 6 sections	Section control compatible Rate Controller Loom for the control of one liquid channel supporting up to 6 sections. MORRIS GEN 4 require one Loom each.	Essential - order one per liquid channel when implementing section control.
AA-C2923-10M	Section Control Loom (10m) 2 – 6 sections	10 metre Loom connects the AA-C2923 Loom to a Stacker Section Control module (up to 6 sections). One Loom required per liquid channel.	Order one of these two Looms for each liquid channel.
AA-C2923-2M	Section Control Loom (2m) 2 – 6 sections	2 metre Loom connects the AA-C2923 Loom to the Stacker Section Control module. One Loom required per liquid channel. Ideal when Rate Control Module and Section Control Module are mounted side by side.	
AA-C2923-5M	Section Control Extension Loom (5m) 2 – 6 sections	5 metre extension for Section Control Looms AA-C2923-2M or AA-C2923-10M.	Optional - only order if additional length required.

Single liquid section control Loom configuration.



More than one liquid? Order a separate set of Looms for each liquid channel.

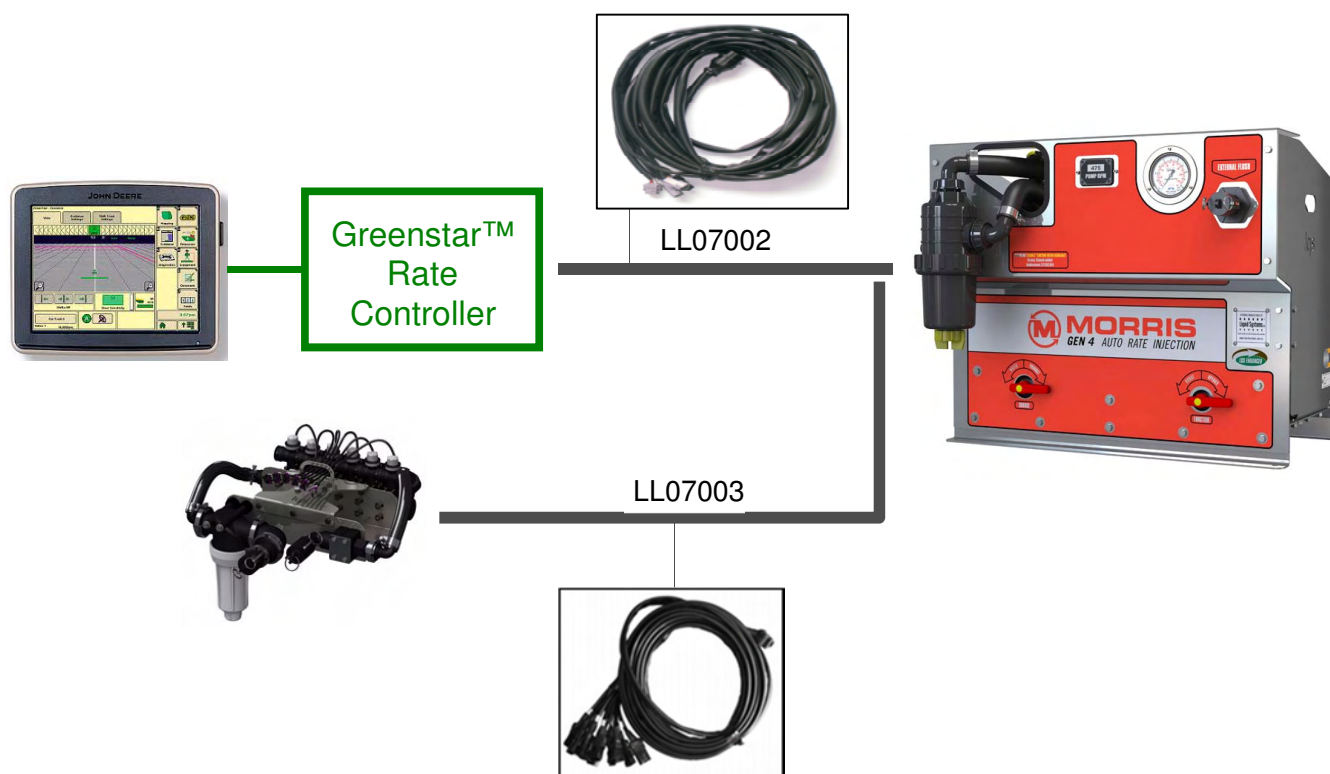
GREENSTAR™ LOOMS

Section Control – 7 to 10 Sections

The following Looms integrate our system with Greenstar™ and implement section control for up to 10 sections. The table and diagram below provide information to assist in ordering.

Order Code	Product	Description	Order when?
LL07002	Greenstar Section Control Compatible Loom 7-10 sections	Section control compatible Rate Controller Loom for the control of one liquid channel supporting up to 10 sections. MORRIS GEN 4 and Spiker require one Loom each.	Essential - order one per liquid channel when implementing 7 to 10 sections.
LL07003	Section Control Loom 7-10 sections	10 metre Loom connects the LL07002 Loom to a Stacker Section Control module (up to 10 sections). One Loom required per liquid channel.	Essential - order one per liquid channel when implementing 7 to 10 sections.

Single liquid section control Loom configuration.

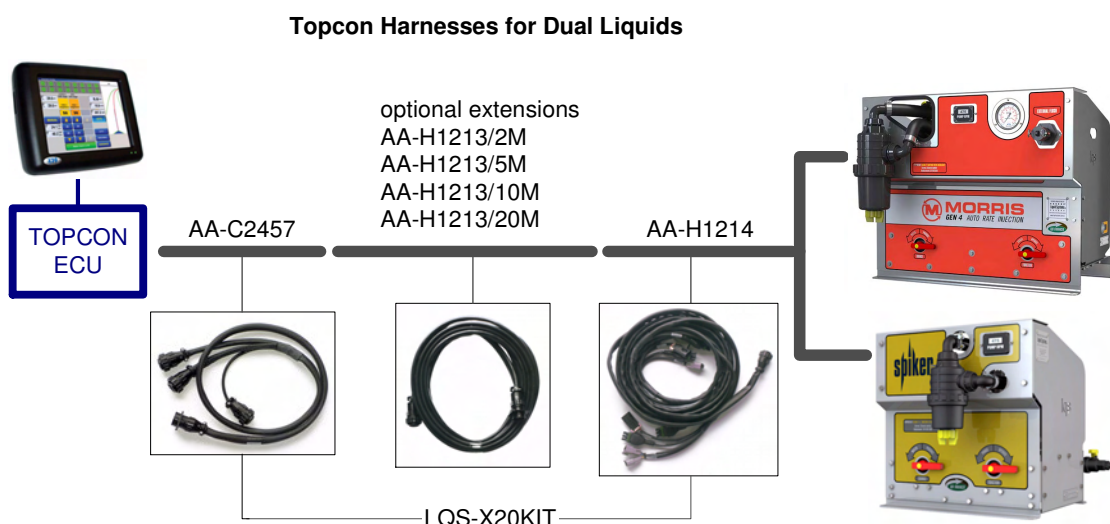
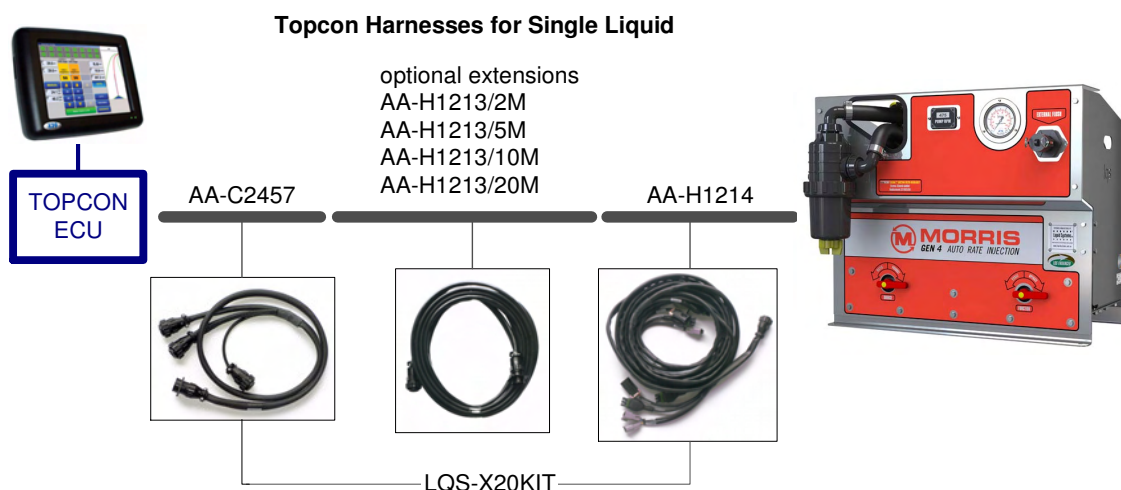


More than one liquid? - Order a complete set of Looms for each liquid channel.

TOPCON LOOMS

Liquid Systems (SA) Rate Control Modules can be integrated with Topcon X20/X30 Console via standard Topcon ECUs. Liquid Systems (SA) provides Looms to implement this integration. These Looms provide connectivity for control of two liquids.

Order Code	Product	Description
LQS-X20KIT	Topcon X20/X30 Loom Kit (7m)	Looms to connect a Topcon ECU to Liquid Systems (SA) Rate Control Module(s). This Loom kit can provides integration for up to two liquid rate control channels.
AA-H1213/20M	L2/X20/X30 20m Extension Loom	20 metre extension Loom for Topcon or L2 Looms.
AA-H1213/10M	L2/X20/X30 10m Extension Loom	10 metre extension Loom for Topcon or L2 Looms.
AA-H1213/5M	L2/X20/X30 5m Extension Loom	5 metre extension Loom for Topcon or L2 Looms.
AA-H1213/2M	L2/X20/X30 2m Extension Loom	2 metre extension Loom for Topcon or L2 Looms.



SECTION CONTROL Looms are available. Please contact Liquid Systems (SA) for a quote.

AG LEADER LOOMS

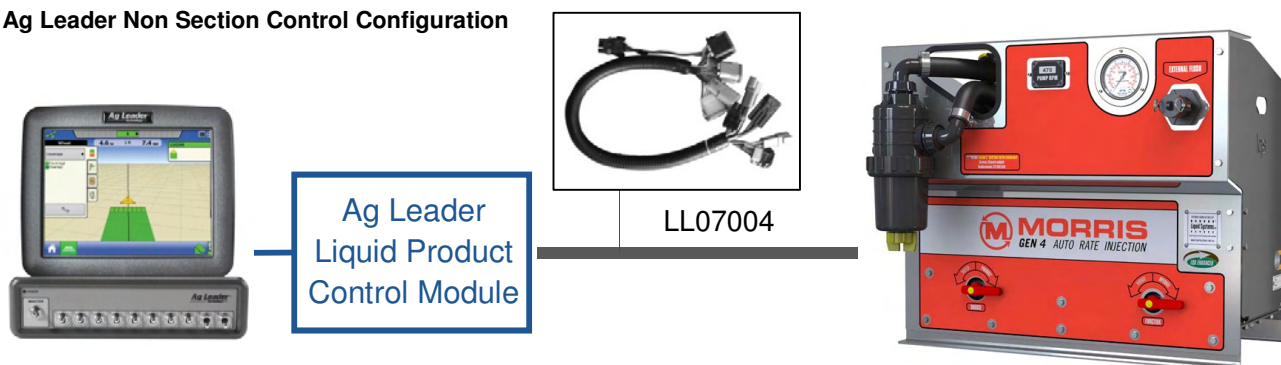
Liquid Systems (SA) has Looms for integration with Ag Leader systems including the Versa and Integra displays. Looms for implementing section control with up to 6 sections are currently available. Liquid Systems Rate Control modules connect to Versa and Integra displays via an Ag Leader Liquid Product Control Module. The table and diagrams below provide information to assist in ordering.

Order Code	Product	Description	Order When?
LL07004	Ag Leader Loom	Connects a Liquid Systems Rate Control Module to an Ag Leader Liquid Product Control Module .	Whenever integrating a Liquid Systems Rate Control Module with an Ag Leader Versa or Integra system. One Loom per liquid channel.
AA-C2923-2M	2m Section Control (2-6) Loom	Connects a Liquid Systems Section Control module to Liquid Systems Rate Control module. 2 metre (6.5') length.	When implementing section control with 2 to 6 sections, one of either of these Looms is required. Select the most suitable based on cable routing distance between the Rate Control module and the Section Control module.
AA-C2923-10M	10m Section Control (2-6) Loom	Connects a Liquid Systems Section Control module to Liquid Systems Rate Control module. 10 metre (33') length.	
AA-C2923-5M	5m Section Control (2-6) Extension	Adds 5 metres (16') of extra length to an AA-C2923-2M or AA-C2923-10M Loom.	When additional length is required for the Section Control (2-6) Loom or a breakaway is required between implements.

Depending on existing equipment configuration, additional Ag Leader components may be required. Contact your Ag Leader agent or Liquid Systems (SA).

Liquid Systems (SA) is a distributor of Ag Leader products and can supply all components for integration with existing Ag Leader installations or a complete Ag Leader system for planters and air seeders.

Ag Leader Non Section Control Configuration



Ag Leader Section Control Configuration (2-6 sections)



Ag Leader
Liquid Product
Module



LL07004



optional
5m extension
AA-C2923-5M



AA-C2923-10M or AA-C2923-2M



TRIMBLE LOOMS

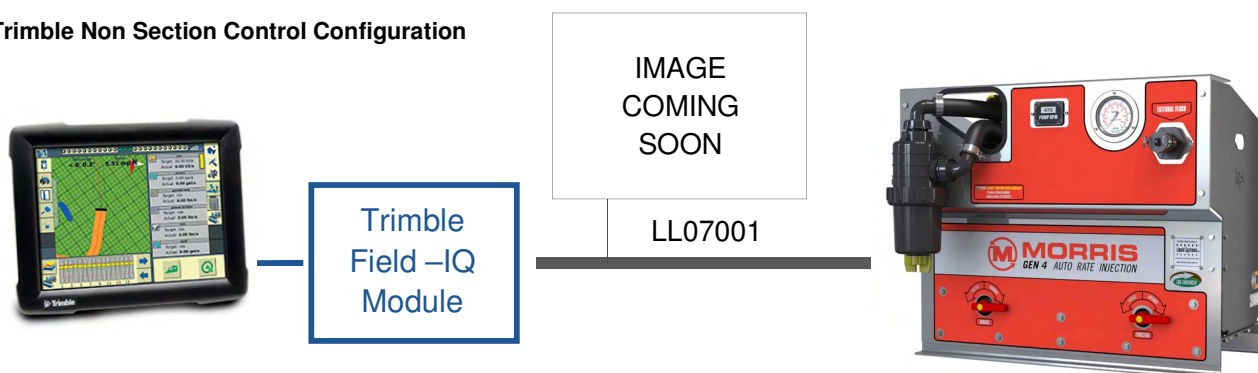
Liquid Systems (SA) has Looms for integration with Trimble Field-IQ compatible systems including the CFX-750 and FmX. (Also sold as FM-750 and FM-1000 by Case New Holland)

Looms for implementing section control with up to 12 sections are currently available. The table and diagrams below provide information to assist in ordering.

Order Code	Product	Description	Order When?
LL07001	Trimble Field IQ Loom	Connects to a Liquid Systems Rate Control Module to a Trimble Field-IQ Rate & Section Control Module.	Whenever integrating a Liquid Systems Rate Control Module with a Trimble Field IQ compatible system. One Loom per liquid channel.
AA-C2923-2M	2m Section Control (2-6) Loom	Connects a Liquid Systems Section Control module to Liquid Systems Rate Control module. 2 metre (6.5') length.	When implementing section control with 2 to 6 sections, one of either of these Looms is required. Select the most suitable based on cable routing distance between the Rate Control module and the Section Control module.
AA-C2923-10M	10m Section Control (2-6) Loom	Connects a Liquid Systems Section Control module to Liquid Systems Rate Control module. 10 metre (33') length.	
AA-C2923-5M	5m Section Control (2-6) Extension	Adds 5 metres (16') of extra length to an AA-C2923-2M or AA-C2923-10M Loom.	When additional length is required for the Section Control (2-6) Loom or a breakaway is required between implements.
LL07003	Section Control (7-12) Loom	Connects a Liquid Systems Section Control module to Liquid Systems Rate Control module. 10 metre (33') length.	When implementing section control with between 7 and 12 sections.

Depending on existing equipment configuration, additional Trimble components may be required. Contact your Trimble agent or Liquid Systems (SA).

Trimble Non Section Control Configuration



**Trimble Section Control Configuration
(2-6 sections)**



Trimble
Field –IQ
Module

IMAGE
COMING
SOON

LL07001



AA-C2923-10M or AA-C2923-2M

optional
5m extension
AA-C2923-5M



**Trimble Section Control Configuration
(7-12 sections)**



Trimble
Field –IQ
Module

IMAGE
COMING
SOON

LL07001



LL07003





Stacker Distribution System is a pressurised distribution system using custom components to provide even distribution and unbroken streams when applying liquid fertilizers, micronutrients and crop protection products in-furrow.

Systems are supplied as a complete kit configured to suit the air seeder tillage bar or row crop planter to which it will be fitted. To order a Stacker Distribution System, you need to choose:

- Manifold Configuration
- Number and type of Terminal Outlets

Liquid Systems (SA) has a range of Manifold Configurations and Terminal Outlets to suit a variety of liquid application regimes and equipment. Further information about these configurations appears on the following pages.

STACKER Custom Components

Rubber Unions



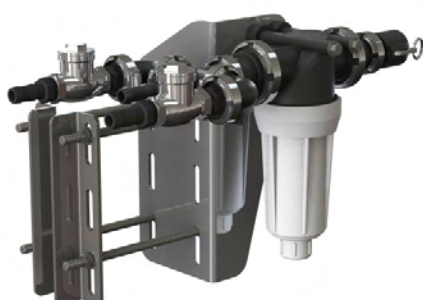
Line Meters



Check Valves



Induction Filter Assemblies



STACKER Manifolds



Universal Manifold Mounting Assembly



Kink Resistant LLDPE Delivery Tube



Line Meter Selection

The line meter is a restrictive device designed to provide system back-pressure, essential to maintain accurate and even product distribution across the air tool or planter. The system operates best at pressures from 0.5 to 6 bar (7 to 87psi).



To select the most suitable line meter for your particular application requirement use the following formulas to get the flow in L/min for the lowest and highest application rate/ground speed combinations.

Metric

$$\frac{W \times R \times S}{600}$$

Where:

W is opener spacing in metres

R is rate in L/Ha

S is operating ground speed in km/h

US

$$\frac{W \times R \times S}{1570}$$



Where:

W is opener spacing in inches

R is rate in US Gal/Acre

S is operating ground speed in MPH

Use the following data tables to lookup line meter size that covers the L/min range required.

 Line Meter Size	WATER (SG 1.0) L/min							
	0.5 bar	1 bar	1.5 bar	2 bar	3 bar	4 bar	5 bar	6 bar
Red 0.55	0.125	0.160	0.190	0.225	0.285	0.315	0.355	0.375
Green 0.70	0.185	0.255	0.300	0.345	0.415	0.465	0.520	0.580
Blue 0.85	0.310	0.434	0.520	0.610	0.680	0.780	0.830	0.900
Yellow 1.2	0.650	0.890	1.050	1.170	1.280	1.480	1.600	1.740
Black 1.7	1.600	2.100	2.500	2.625	3.000	3.300	3.600	3.900
Grey 2.5	2.200	3.250	3.900	4.800	5.600	6.400	7.200	8.100
 Line Meter Size	UAN (SG 1.32) 32.0% N (W/W) L/min							
	0.5 bar	1 bar	1.5 bar	2 bar	3 bar	4 bar	5 bar	6 bar
Red 0.55	0.115	0.150	0.185	0.210	0.260	0.282	0.305	0.332
Green 0.70	0.200	0.270	0.325	0.360	0.415	0.465	0.510	0.580
Blue 0.85	0.275	0.370	0.450	0.490	0.560	0.630	0.700	0.740
Yellow 1.2	0.500	0.670	0.800	0.910	1.065	1.215	1.305	1.395
Black 1.7	1.290	1.400	2.000	2.200	2.500	2.780	3.000	3.200
Grey 2.5	2.100	2.830	3.400	3.850	4.600	5.350	5.830	6.420

Standard Air Tool Manifold Configurations

Our standard manifold configurations provide even distribution of liquid across tillage bars with up to 100 rows. Configurations are available with from one to five manifold assemblies, in single or dual liquid configurations. Each manifold is capable of delivering liquid to up to 20 rows.

To avoid damage to delivery tubing, at least one manifold per folding section is required. I.e. a double fold tillage bar requires 5 manifolds.

Standard Single

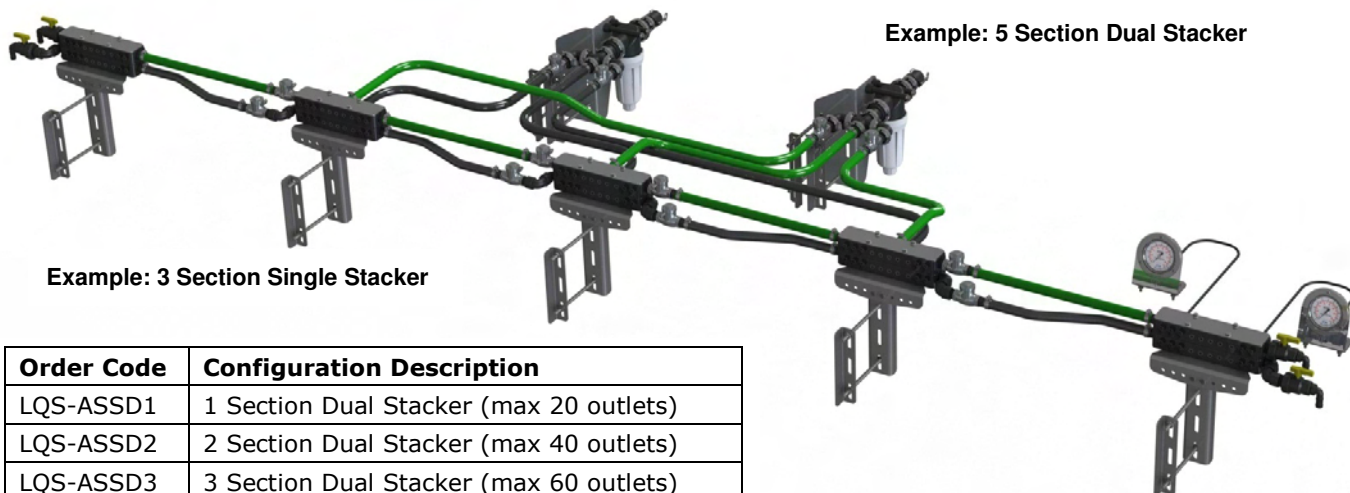
Order with MORRIS GEN 4 Rate Control Module.



Order Code	Configuration Description
LQS-ASST1	1 Section Single Stacker (max 20 outlets)
LQS-ASST2	2 Section Single Stacker (max 40 outlets)
LQS-ASST3	3 Section Single Stacker (max 60 outlets)
LQS-ASST4	4 Section Single Stacker (max 80 outlets)
LQS-ASST5	5 Section Single Stacker (max 100 outlets)

Standard Dual

Order with two MORRIS GEN 4 Rate Control Modules.



Order Code	Configuration Description
LQS-ASSD1	1 Section Dual Stacker (max 20 outlets)
LQS-ASSD2	2 Section Dual Stacker (max 40 outlets)
LQS-ASSD3	3 Section Dual Stacker (max 60 outlets)
LQS-ASSD4	4 Section Dual Stacker (max 80 outlets)
LQS-ASSD5	5 Section Dual Stacker (max 100 outlets)

If you need something different, contact Liquid Systems (SA) for a custom configuration.

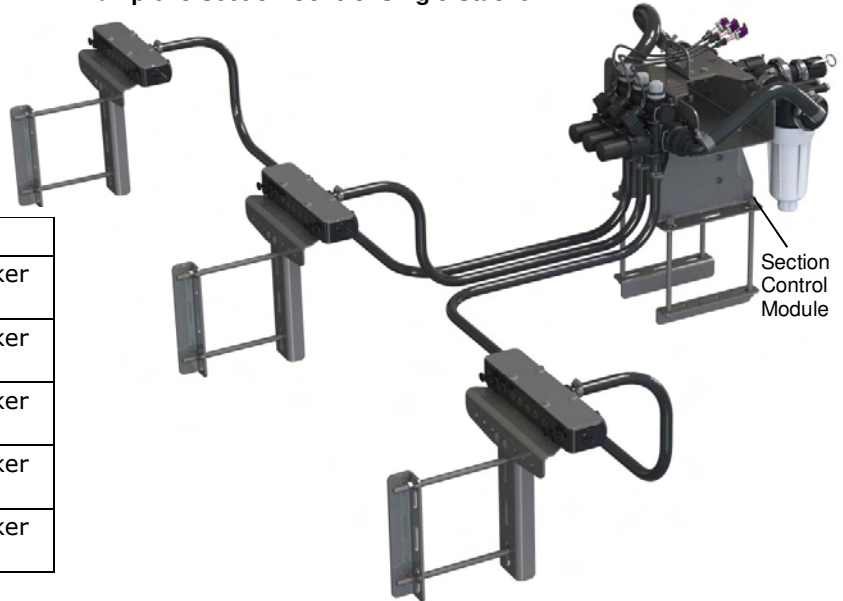
Section Control Air Tool Manifold Configurations

Section Control manifold configurations include a Section Control module. This module incorporates 3 way electric ball valves in a constant flow configuration for instantaneous shut-off with seamless rate control. The modules come with a stainless steel mounting bracket and line filter. 3 to 6 section systems are available.

Section Control Single

Order MORRIS GEN 4 Rate Control Module.

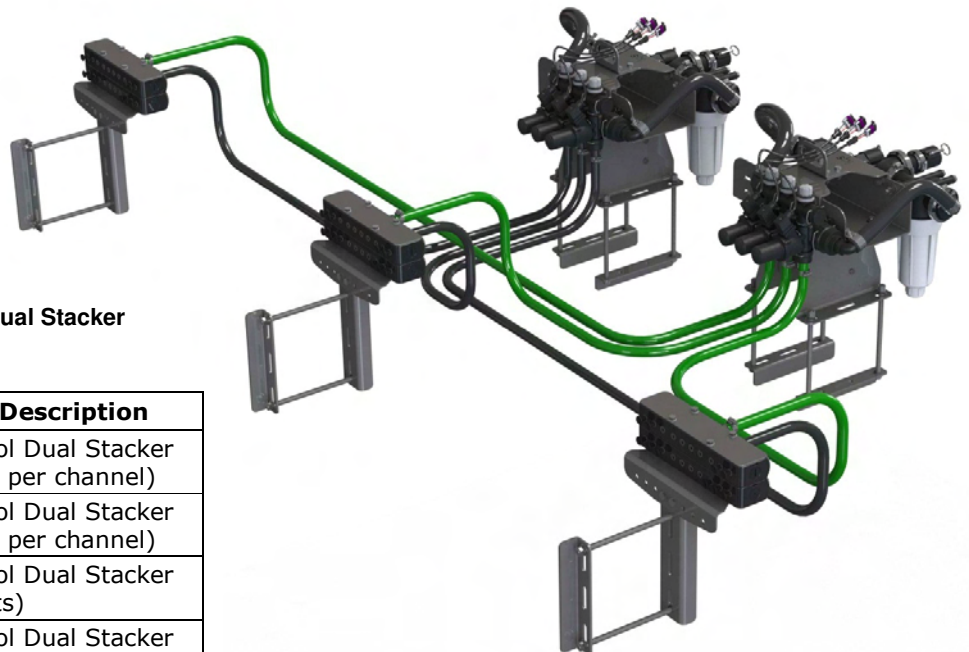
Example: 3 Section Control Single Stacker



Order Code	Configuration Description
LQS-ACST3	3 Section Control Single Stacker (max 60 outlets)
LQS-ACST4	4 Section Control Single Stacker (max 80 outlets)
LQS-ACST5	5 Section Control Single Stacker (max 100 outlets)
LQS-ACST6	6 Section Control Single Stacker (max 120 outlets)
LQS-ACST8	8 Section Control Single Stacker (max 160 outlets)

Section Control Dual

Order with two MORRIS GEN 4 Rate Control Modules.



Example: 3 Section Control Dual Stacker

Order Code	Configuration Description
LQS-ACSD3	3 Section Control Dual Stacker (max 60 outlets per channel)
LQS-ACSD4	4 Section Control Dual Stacker (max 80 outlets per channel)
LQS-ACSD5	5 Section Control Dual Stacker (max 100 outlets)
LQS-ACSD6	6 Section Control Dual Stacker (max 120 outlets)
LQS-ACSD8	8 Section Control Dual Stacker (max 160 outlets)

Air Tool Terminal Configurations

Liquid Systems now has 5 different terminal configurations for liquid distribution setups on air seeder tillage bars. With Air Tool Terminal Configurations, the line from each manifold outlet can be split into two separate delivery lines. All terminal configurations include in-line check valves for quick shut-off and start-up and a range of line meters. All connections are push-fit for simple assembly and maintenance.

Example: Standard Terminals connected to Stacker Manifold



Low Rate 4mm

ORDER CODE: LQS-ATL4

8mm Tees to split flow from manifold
8mm delivery line
inline check valve
line meters 3 sizes inc: Red/Green/Blue
8-4mm Stem Reducer
V3 rubber union
4mm OD x 1.8mm ID terminal tube

Fits to 6.35mm (1/4") OD x 4.53mm ID stainless steel delivery tube (not included).

Suitable for rates up to 100L/Ha, 10 US Gal/Acre on 9-12" Spacing



Low Rate 4mm Extended

ORDER CODE: LQS-ATL4X




8mm Tees to split flow from manifold
8mm delivery line
inline check valve
line meters 3 sizes inc: Red/Green/Blue
8-4mm Stem Reducer
V3 rubber union
4mm OD x 1.8mm ID terminal tube

Fits to 6.35mm (1/4") OD x 4.53mm ID stainless steel delivery tube (not included).

Extended version of ATL4 configured to raise the position of check valve & line meter to avoid stubble damage



Air Tool Terminal Configurations continued

 <p>Low Volume FIBP ORDER CODE: LQS-ATFB</p> <p>8mm Tees to split flow from manifold 8mm delivery line inline check valve 8-5mm Stem Reducer V4 rubber union 5mm OD x 1.2mm ID terminal tube</p> <p>Fits to 3/8" (9.53mm) OD x 1/4" (6.2.7mm) ID stainless steel delivery tube (not included).</p> <p>Permits large bore/ultra-low application. Ability to apply difficult materials. No Line meter is used with this option as back pressure is created via line friction-the longer the line the higher the back pressure.</p>	 <p>Standard ORDER CODE: LQS-ATST</p> <p>8mm Tees to split flow from manifold 8mm delivery line inline check valve line meters (choose 3 sizes included) V4 rubber union 5mm OD x 2.5mm Terminal tube</p> <p>Fits to 3/8" (9.53mm) OD x 1/4" (6.2.7mm) ID stainless steel delivery tube (not included).</p> <p>Good stream control across a wide range of application rates. For openers spaced 9"-15".</p>
 <p>High Rate ORDER CODE: LQS-ATHR</p> <p>8mm Tees to split flow from manifold 8mm delivery line inline check valve line meters (choose 3 sizes included) 8mm terminal tube</p> <p>Fits to 1/4" (6.35mm) OD stainless steel delivery tube (not included).</p> <p>Suited for high rate applications or points with 1/4" liquid delivery tubes.</p>	

Check Valve Boots

ORDER CODES: L08050

Product Description

The Elastomer Check Valve 'Boots' completely isolate the cap mechanism from external contaminants without affecting check valve performance! They are easily stretched over the cap, yet ensuring a tight fit to keep dust, dirt and mud out.

Understanding what farmers go through we are sure they will welcome this product to help minimise blockages when seeding and spraying. **This product will also fit most conventional TeeJet spray rig check valves.**

