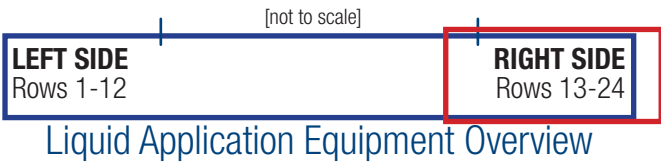
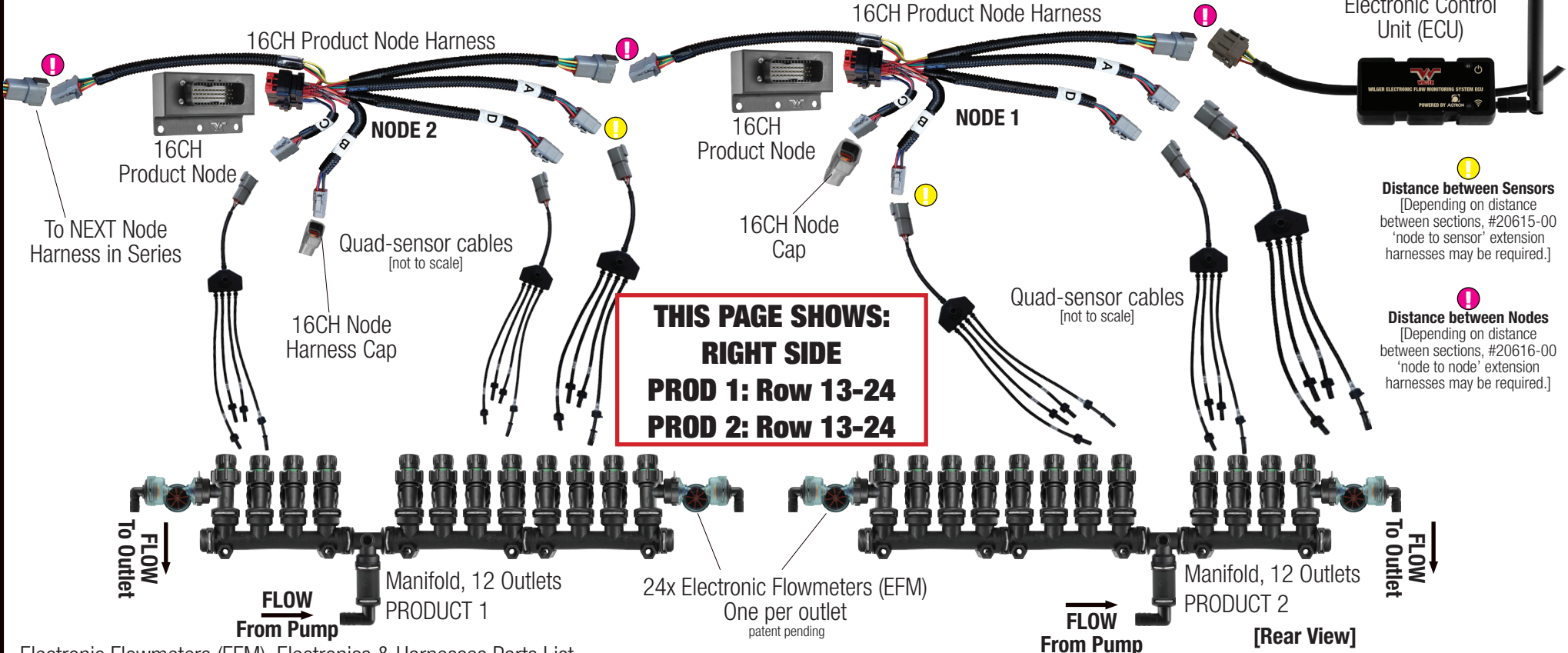


System Overview - 24 Outlet Monitoring System

2 Sections, 12-12, Two Products (48 row total)



Liquid Application Equipment Overview



Electronic Flowmeters (EFM), Electronics & Harnesses Parts List

Quantity	PART#	Description	Extra Information
1	20603-00	ECU Base Kit	incl. 20' battery harness, terminator, ECU, ECU antenna
4	20621-00	16CH Node Kit	incl. 16CH Node, 16CH Node Harness, 4x Quad-sensor cable
4	20612-00	16CH Node Harness Cap	Covers unused quad-sensor cable connections
as req'd	20615-00	Ext. Harness [NODE to SNR]	6' Extension Harness [6-pin], NODE to QUAD-SENSOR CABLE
as req'd	20616-00	Ext. Harness [NODE to NODE]	12' Extension Harness [8-pin], NODE Harness to NODE Harness

Manifold, Plumbing & Auxiliary Parts List

Quantity	PART#	Description	Extra Information
12	20634-00	4 Outlet EFM Manifold Kit	incl. 4-Outlet manifold, 4 EFM assembly kits (incl. jets), 4x Check Valve
0	20633-00	3 Outlet EFM Manifold Kit	incl. 3-Outlet manifold, 3 EFM assembly kits (incl. jets), 3x Check Valve
4	20576-00	ORS Manifold Strainer	One strainer per Manifold Feed.
8	20521-00	ORS Manifold End-cap	Two used per center-fed manifold.
4	20526-00	ORS TEE w/ 1/4" NPT-F*	*1/4" NPT Port comes sealed; must be drilled out to be used.
4	205XX-00	ORS Inlet Fitting	ORS Inlet must be selected from catalog by preference (up to 1").
48	205XX-00	ORS Outlet Fitting	ORS Outlet must be selected from catalog by preference.
48	21500-VXX	ORS Metering Orifice	ORS metering orifice size must be selected by required flow rate.

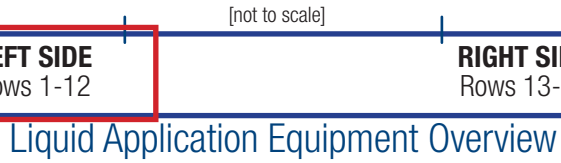
Each EFM has a sensor cable plugged into it. When powered, each EFM sends signal through the Product Node Harness, to Product Node, to ECU.

From ECU, wireless transmits to an Android tablet, and displays flow rate and other information to user.

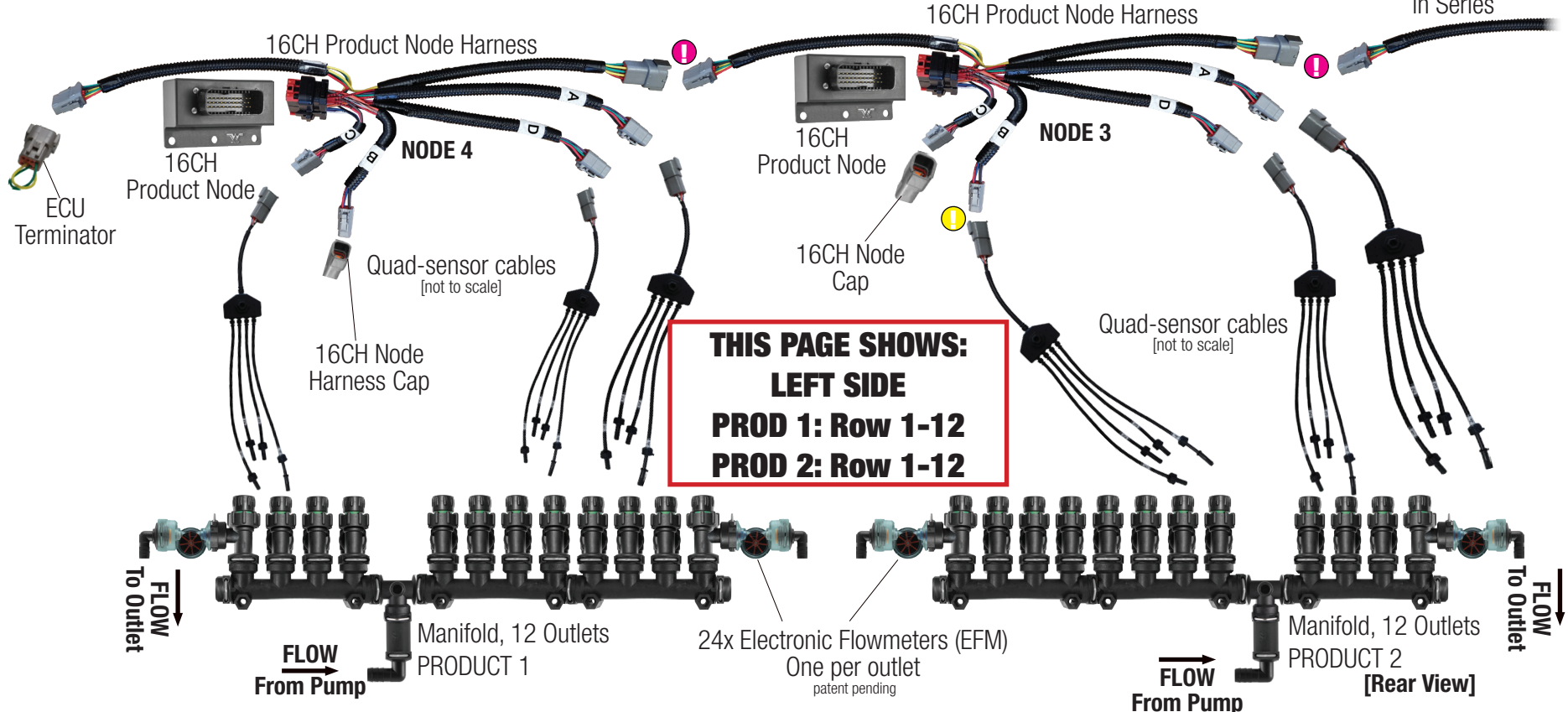
Part No. 24 Outlet EFM Plumbing Manifold Assembly Overview, 2 product (2x 24)	Rev. 1 Feb 7/20
Item Description Flow Monitoring Manifold System, 48 Total Outlets ORS Manifold Plumbing, 2 Section Layout (12-12), 2 Prod (2x 24)	
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System Overview - 24 Outlet Monitoring System

2 Sections, 12-12, Two Products (48 row total)



Liquid Application Equipment Overview



Distance between Sensors
 [Depending on distance between sections, #20615-00 'node to sensor' extension harnesses may be required.]

Distance between Nodes
 [Depending on distance between sections, #20616-00 'node to node' extension harnesses may be required.]



Each EFM (24 total) has a sensor cable plugged into it. When powered, each EFM sends signal through the Product Node Harness, to Product Node, to ECU.

From ECU, wireless transmits to an Android tablet, and displays flow rate and other information to user.

Part No. 24 Outlet EFM Plumbing Manifold Assembly Overview, 2 product (2x 24)	Rev. 1 Feb 7/20
Item Description Flow Monitoring Manifold System, 48 Total Outlets ORS Manifold Plumbing, 2 Section Layout (12-12), 2 Prod (2x 24)	



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Manual ON/OFF Check Valve

When 'ON', acts like check valve.
When 'OFF', turns off flow for maintenance/etc.



Flowmeter Jet patent pending

Stabilizes the flow across the flowmeter paddle wheel for more accurate and consistent readings
Color coded to flow range.
(Green/Red/Blue/Black)

Flowmeter Body patent pending

Sensor is inserted into [rear side] housing.
Relays pulse feedback to product node.



ORS Metering Orifice [Optional*]

If manifold is being used to meter liquid flow, use orifice. If metering orifice exists in system elsewhere, ignore ORS metering orifice.



ORS Outlet/Inlet Fittings

A variety of sizes and types of fittings can be used from the O-ring Seal (ORS) outlet family. From Hose Barbs, to threads, to quick-connect tube.

[Optional] ORS Strainer [not to scale]
50 Mesh ORS Strainer Assembly
Housing + Strainer Cartridge



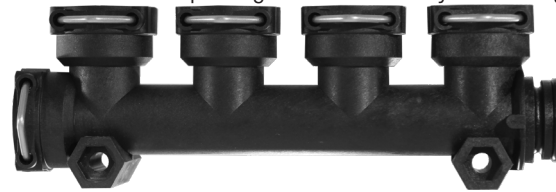
ORS Tee [not to scale]

Center-feeds a plumbing manifold with an ORS Inlet



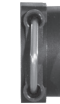
ORS Manifolds [not to scale]

O-ring seal manifolds are available in 1-4 outlet varieties. Common U-clip design connects to any ORS fittings.



ORS End-Cap [not to scale]

An end-cap is used to terminate any manifold end.



Manifold, 12 Outlets



[Back View]
No sensor cable

Part No. EFM Plumbing Manifold, 12 Outlet

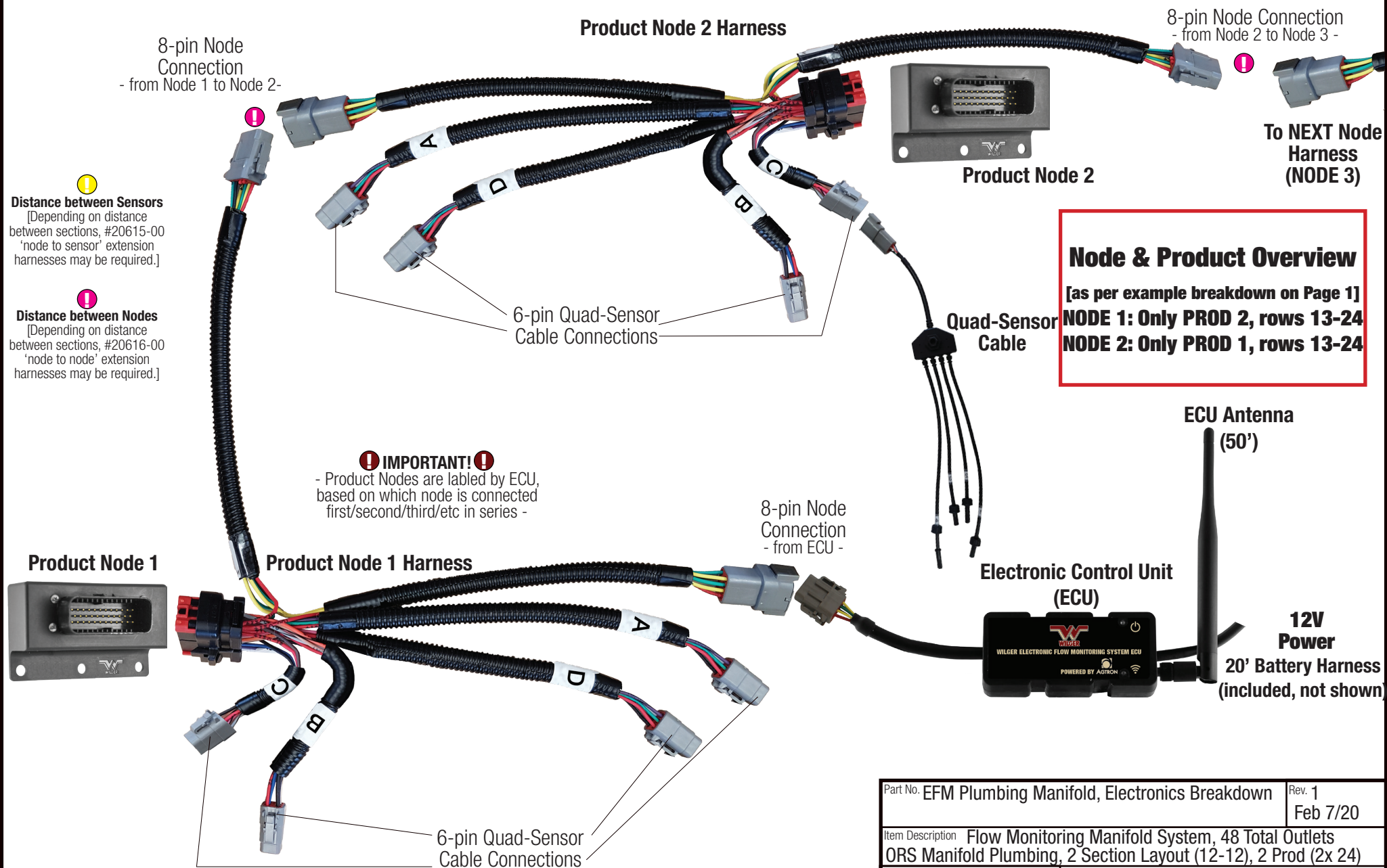
Rev. 1
Feb 7/20

Item Description Flow Monitoring Manifold System, 48 Total Outlets
ORS Manifold Plumbing, 2 Section Layout (12-12), 2 Prod (2x 24)



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Electronics Breakdown, [Up to] 32 Sensors Total Covering: RIGHT WING SENSORS: 2x 12



Distance between Sensors
[Depending on distance between sections, #20615-00 'node to sensor' extension harnesses may be required.]

Distance between Nodes
[Depending on distance between sections, #20616-00 'node to node' extension harnesses may be required.]

IMPORTANT!
- Product Nodes are labeled by ECU, based on which node is connected first/second/third/etc in series -

Node & Product Overview
[as per example breakdown on Page 1]
NODE 1: Only PROD 2, rows 13-24
NODE 2: Only PROD 1, rows 13-24

Extension Harness are also available [not shown]
12' Node to Node Extension Harnesses [8-pin]
6' Node to Quad-Sensor Cable Extension Harnesses [6-pin]

Part No. EFM Plumbing Manifold, Electronics Breakdown	Rev. 1 Feb 7/20
Item Description Flow Monitoring Manifold System, 48 Total Outlets ORS Manifold Plumbing, 2 Section Layout (12-12), 2 Prod (2x 24)	



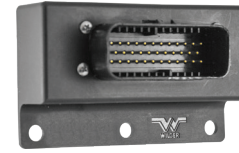
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Electronics Breakdown, [Up to] 32 Sensors Total Covering: LEFT WING SENSORS: 2x 12

8-pin Node Connection
- from Node 2 to Terminator -

8-pin Node Connection
- from Node 3 to Node 4-

Product Node 4 Harness



IMPORTANT!
- A terminator must be connected to the last node in series' 8-pin connection -

Distance between Sensors
[Depending on distance between sections, #20615-00 'node to sensor' extension harnesses may be required.]

Distance between Nodes
[Depending on distance between sections, #20616-00 'node to node' extension harnesses may be required.]

6-pin Quad-Sensor Cable Connections

Quad-Sensor Cable

Node & Product Overview

[as per example breakdown on Page 1]
NODE 3: Only PROD 2, rows 1-12
NODE 4: Only PROD 1, rows 1-12

IMPORTANT!
- Product Nodes are labeled by ECU, based on which node is connected first/second/third/etc in series -

NODE Harness from RIGHT WING [via Extension Harness(es) if req'd]

NODE 2

NODE 1

ECU

8-pin Node Connection
- from NODE 2-

Product Node 3

Product Node 3 Harness

6-pin Quad-Sensor Cable Connections

Extension Harness are also available [not shown]
12' Node to Node Extension Harnesses [8-pin]
6' Node to Quad-Sensor Cable Extension Harnesses [6-pin]

Part No. EFM Plumbing Manifold, Electronics Breakdown

Rev. 1
Feb 7/20

Item Description Flow Monitoring Manifold System, 48 Total Outlets
ORS Manifold Plumbing, 2 Section Layout (12-12), 2 Prod (2x 24)



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Sensor Connections Breakdown - 12 Outlet Manifold

8-pin Node Connection
- to Next Node in series or Terminator-

IMPORTANT!
- Product Nodes are labeled by ECU, based on which node is connected first/second/third/etc in series -

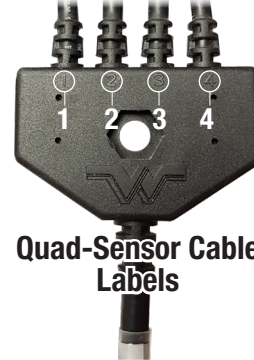
8-pin Node Connection
- from ECU or previous node in series-

16CH Product Node Harness

16CH Product Node

Node & Product Overview
[as per example breakdown on Page 1]
NODE 1: Only PROD 2, rows 13-24
NODE 2: Only PROD 1, rows 13-24
NODE 3: Only PROD 2, rows 1-12
NODE 4: Only PROD 1, rows 1-12

IMPORTANT!
- Quad-sensor cables have 4 sensors, with the molded label (1/2/3/4) designed by the marking on the base of the cable -



Quad-Sensor Cable Labels

PRO-TIP: Labeling Quad-Sensor Cables

With a white marker, label each quad-sensor cable with A, B, C or D, based on which Product Node Harness cable it is connected to.

Quad-sensor Cable connected to 4 individual EFMs

Each EFM connected to a sensor cable can now be added to the pumping manifold.

16CH Product Node Harness Cover Cap

Since only 3 of 4 harness connections are being used by quad-sensor cables, we need to cap the unused harness connection off.

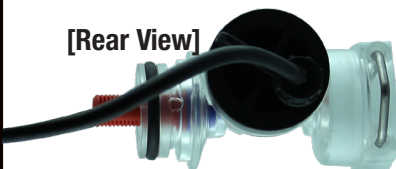
! We will ensure to remember that this harness location 'B' is not used, when entering sensor locations into the APP's sensor setup screen.

For example:
NODE 1, DIV B, SNR 1 will NOT be a valid sensor location, as DIV B is capped off, so no sensors are attached.

Each EFM has a sensor cable plugged into it. When powered, each EFM sends signal through the Product Node Harness, to Product Node, to ECU.

From ECU, wireless transmits to an Android tablet, and displays flow rate and other information to user.

[Rear View]





Part No. EFM Plumbing Manifold, 12 Outlet, Sensor Connections Breakdown,	Rev. 1 Feb 7/20
Item Description Flow Monitoring Manifold System, 48 Total Outlets ORS Manifold Plumbing, 2 Section Layout (12-12), 2 Prod (2x 24)	



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NOTE: The following may look different depending on app version being used, but in essence, will be the same. Follow the manual for the most up-to-date reflection of the app.

How To Label Sensors For Entry Into APP - PRODUCT 1: Outlets 1-24 [PRODUCT NODE 4 & 2]

After completely setting up the ECU Settings Screen , enter the Sensor Setup Screen , which allows you to enter each respective product sensor in it's correct position, relative to the ECU. While sensors do not have to be connected in consecutive order as laid out on your application implement, they do have to be entered accurately within the app to reference properly on the display. The below example screen is only ONE depiction of how to set a screen up. For convenience, you can customize the layout of the outlets on up to 10 'section' pages. It is important that separate products be listed under PROD 1/2/3.

24 Outlets

We have to 'label' a sensor, based on its location. The label is derived from its:

PRODUCT NODE#: NODE 1


IMPORTANT!
- Product Nodes are labeled by ECU, based on which node is connected first/second/third/etc in series -

QUAD-SENSOR CABLE DIVIDER [DIV] LABEL: A / B / C / D

IMPORTANT!
- Quad-sensor divider labels are labeled on the node harness itself, labeled with either an A, B, C, or D -

SENSOR CABLE LABEL: 1 / 2 / 3 / 4

IMPORTANT!
- Sensor cable labels are molded (or labeled) on the actual quad-sensor cable, with either a 1/2/3/4. Ensure you refer the sensor label correctly. -

 Electronic Flow Monitoring Sensor Setup

1	2	3	4	5	6	7	8	9	10
Product	1	2	3	Liquid Nitrogen			Change		
	NODE	DIV	SNR	NODE	DIV	SNR	NODE	DIV	SNR
1	4	C	1	9	A	1	17	C	1
2	4	C	2	10	A	2	18	C	2
3	4	C	3	11	A	3	19	C	3
4	4	C	4	12	A	4	20	C	4
5	4	D	1	13	A	1	21	D	1
6	4	D	2	14	A	2	22	D	2
7	4	D	3	15	A	3	23	D	3
8	4	D	4	16	A	4	24	D	2



How to Read the Sensor Location (Eg. Location 2A4)
After entering your sensor locations into the app, as you'd like them laid out on pages 1-10, you can verify each line of the example as follows:
Outlet 12 is connected to **SENSOR 4** or **[SNR 4]** on the quad-sensor cable, on the **Node Harness Cable 'A'** or **[DIV A]**, which is connected to **Product Node 2** or **[NODE 2]**.

Physical Row Description
This is manually added to depict which row this is on the implement.
For example, if a section begins at row '17', this cell can be entered as "17", etc. In this example, it began at **ROW 1**.

[NODE] PRODUCT NODE #
If the sensor is connected through the PRODUCT NODE #2 harness, ensure under NODE, it is listed as "2".
Ensure a sensor's [NODE] corresponds with its correct NODE #.
In this example, sensors 1-12 began at **NODE 2**.



[DIV] QUAD-SENSOR CABLE HARNESS LABEL
Select A / B / C / D based on the corresponding node harness cable that a quad-sensor cable is attached to.
In our example, the first rows are attached to **DIV C**, as shown in the system overviews.

[SNR] SENSOR CABLE LABEL
Depending on the sensor cable's number (1/2/3/4) that is molded into the quad-sensor cable housing, enter the sensor number with the corresponding outlet.
In our example, **SNR 1** is the first row of product on the implement.

Part No. EFM Sensor Setup 24 Outlet, Sensor Connections Breakdown, NODE 4 & NODE 2	Rev. 1 Feb 7/20
Item Description Flow Monitoring Manifold System, 48 Total Outlets ORS Manifold Plumbing, 2 Section Layout (12-12), 2 Prod (2x 24)	
	
	

NOTE: The following may look different depending on app version being used, but in essence, will be the same. Follow the manual for the most up-to-date reflection of the app.

How To Label Sensors For Entry Into APP - PRODUCT 2: Outlets 1-24 [PRODUCT NODE 3 & 1]

After completely setting up the ECU Settings Screen , enter the Sensor Setup Screen , which allows you to enter each respective product sensor in it's correct position, relative to the ECU. While sensors do not have to be connected in consecutive order as laid out on your application implement, they do have to be entered accurately within the app to reference properly on the display. The below example screen is only ONE depiction of how to set a screen up. For convenience, you can customize the layout of the outlets on up to 10 'section' pages.

24 Outlets

We have to 'label' a sensor, based on its location. The label is derived from its:

PRODUCT NODE#: NODE 1

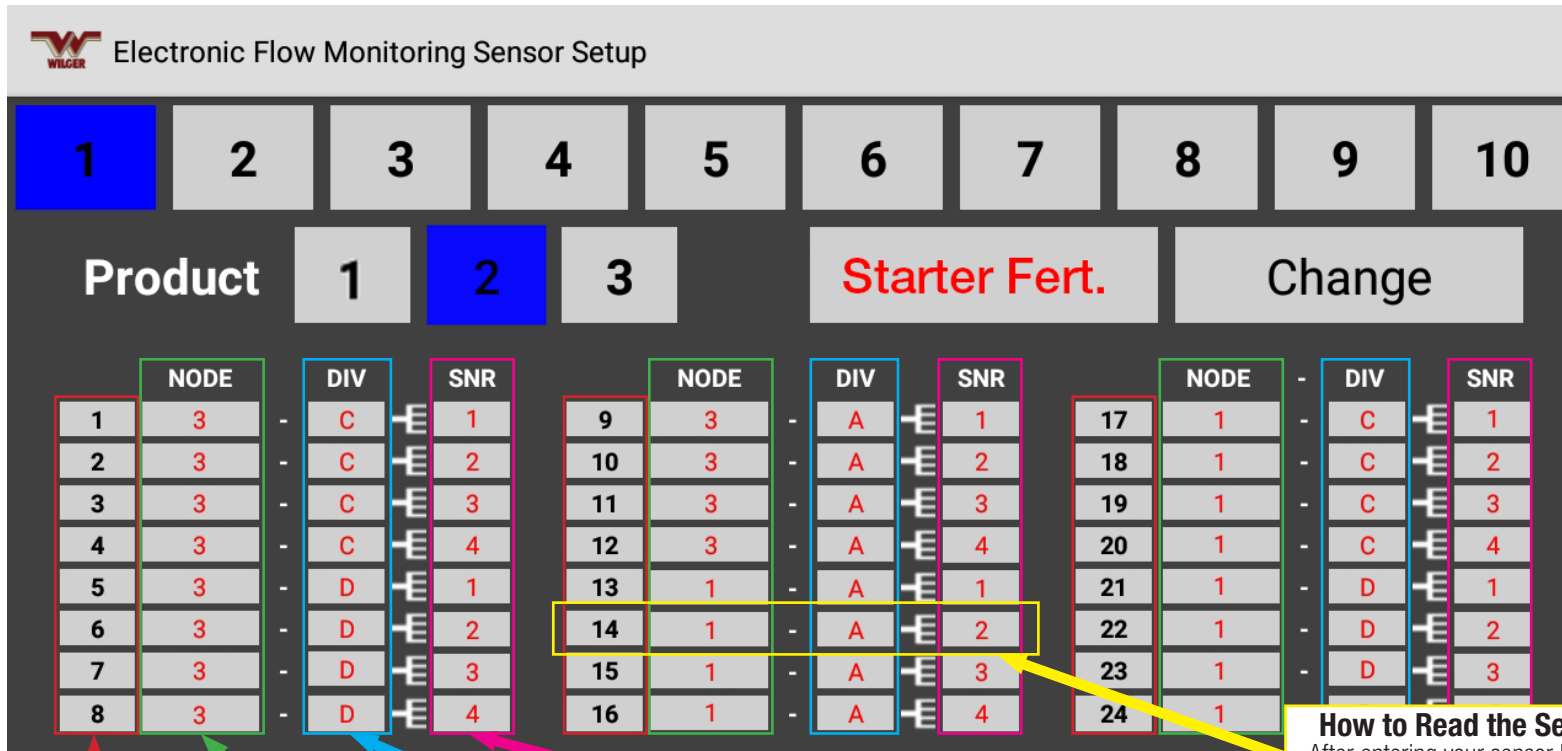
IMPORTANT!
- Product Nodes are labeled by ECU, based on which node is connected first/second/third/etc in series -

QUAD-SENSOR CABLE DIVIDER [DIV] LABEL: A / B / C / D

IMPORTANT!
- Quad-sensor divider labels are labeled on the node harness itself, labeled with either an A, B, C, or D -

SENSOR CABLE LABEL: 1 / 2 / 3 / 4

IMPORTANT!
- Sensor cable labels are molded (or labeled) on the actual quad-sensor cable, with either a 1/2/3/4. Ensure you refer the sensor label correctly. -



Outlet	Product	Node	Div	SNR
1	1	3	C	1
2	2	3	C	2
3	3	3	C	3
4	4	3	C	4
5	5	3	D	1
6	6	3	D	2
7	7	3	D	3
8	8	3	D	4
9	9	3	A	1
10	10	3	A	2
11	11	3	A	3
12	12	3	A	4
13	13	1	A	1
14	14	1	A	2
15	15	1	A	3
16	16	1	A	4
17	17	1	C	1
18	18	1	C	2
19	19	1	C	3
20	20	1	C	4
21	21	1	D	1
22	22	1	D	2
23	23	1	D	3
24	24	1	D	4

How to Read the Sensor Location (Eg. Location 1C2)

After entering your sensor locations as you'd like your rows laid out, you can read & verify each line of the example as follows:

Outlet 14 is connected to **SENSOR 2** or **[SNR 2]** on the quad-sensor cable, on the **Node Harness Cable 'C'** or **[DIV C]**, which is connected to **Product Node 1** or **[NODE 1]**.

Physical Row Description
This is manually added to depict which row this is on the implement.
For example, if a section begins at row '16', this cell can be entered as "16", etc. In this example, it began at **ROW 1**.

[NODE] PRODUCT NODE #
If the sensor is connected to the 16CH PRODUCT NODE #1 harness, ensure under NODE, it is listed as '1'.
Ensure a sensor's [NODE] corresponds with its correct NODE #.
In this example, sensors 1-16 began at **NODE 2**.

[DIV] QUAD-SENSOR CABLE HARNESS LABEL
Select A / B / C / D based on the corresponding node harness cable that a quad-sensor cable is attached to.
in our example, the first rows are attached to **DIV C**, as shown in the system overviews.

[SNR] SENSOR CABLE LABEL
Depending on the sensor cable's number (1/2/3/4) that is molded into the quad-sensor cable housing, enter the sensor number with the corresponding outlet.
Since our first sensor is capped, in our example, **SNR 1** is the first row of product on the implement.

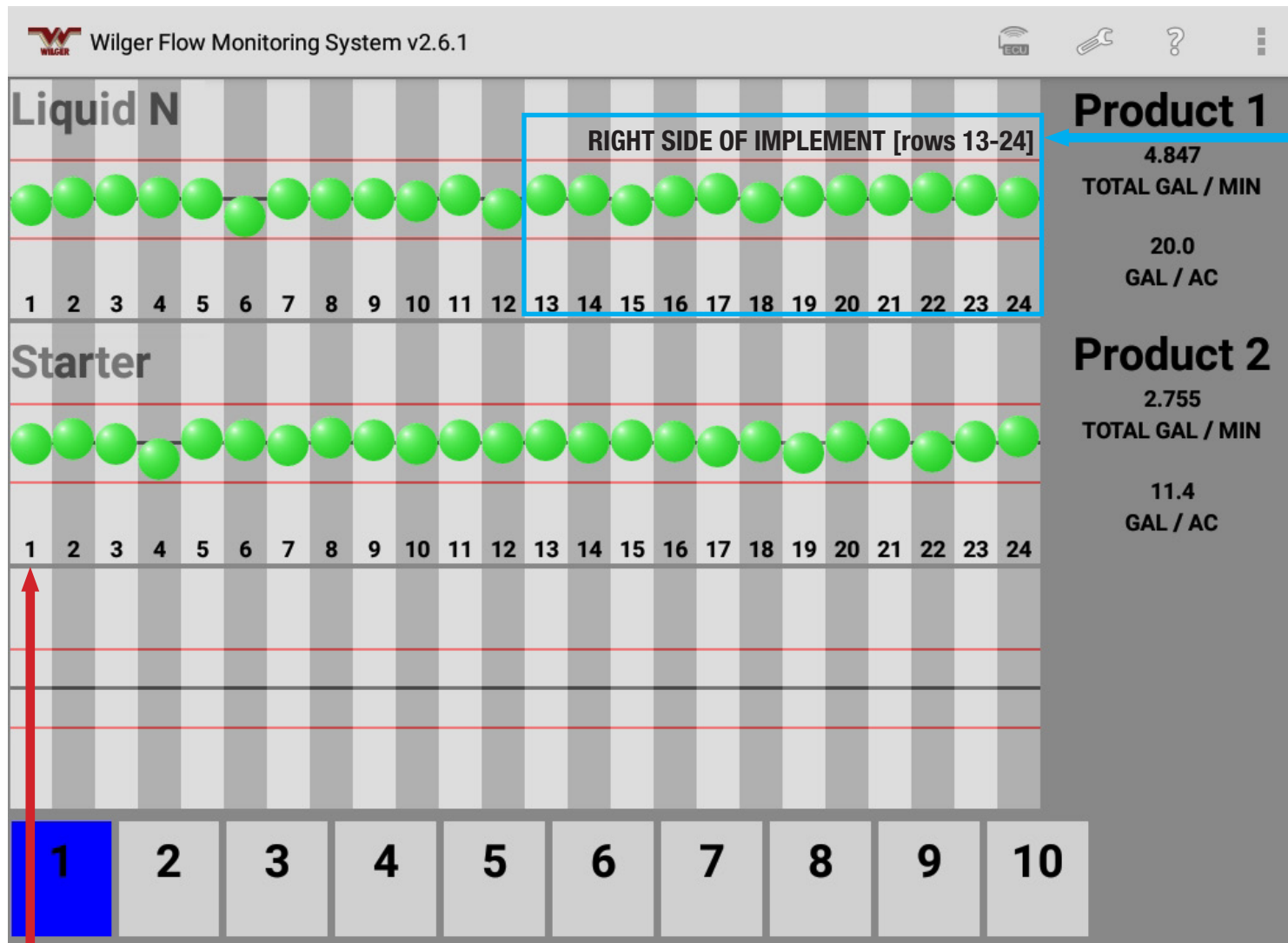
Part No. EFM Sensor Setup 24 Outlet, Sensor Connections Breakdown, NODE 3 & NODE 1	Rev. 1 Feb 7/20
Item Description Flow Monitoring Manifold System, 48 Total Outlets ORS Manifold Plumbing, 2 Section Layout (12-12), 2 Prod (2x 24)	



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NOTE: The following may look different depending on app version being used, but in essence, will be the same. Follow the manual for the most up-to-date reflection of the app.

Example Viewing Screen 24-rows x 2 Products



Customization of 'SECTIONS'

If it was important to show sections individually, you are able to program the app sensor page to show rows 13-24 on a page for section 2.

To change the section page during view, you can click the bottom of the page or have set 'auto page scroll' to a set interval (in seconds).

1
2

Ensure only one reference to each sensor is made, or the system can 'double-count' the flow rate in any accumulated total flow rates/etc.

Refer to the EFM manual, located within the app by clicking the button on the app main screen

App view of Product 2, ROW 1

This ball is labeled as '1', as it is the first row on the implement, applying product 2.

In actuality, the app is just showing the feedback of the sensor located at **3C1:**

**PRODUCT NODE #3
DIVIDER C
SENSOR 1**

It doesn't matter if 3C2 was a product 1 run, as long as the app knows that row has been marked as product 2.

Part No. EFM Sensor Setup 24 Outlet, Sensor Connections Breakdown, Dual Product (2x24)	Rev. 1 Feb 7/20
Item Description Flow Monitoring Manifold System, 48 Total Outlets ORS Manifold Plumbing, 2 Section Layout (12-12), 2 Prod (2x 24)	
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