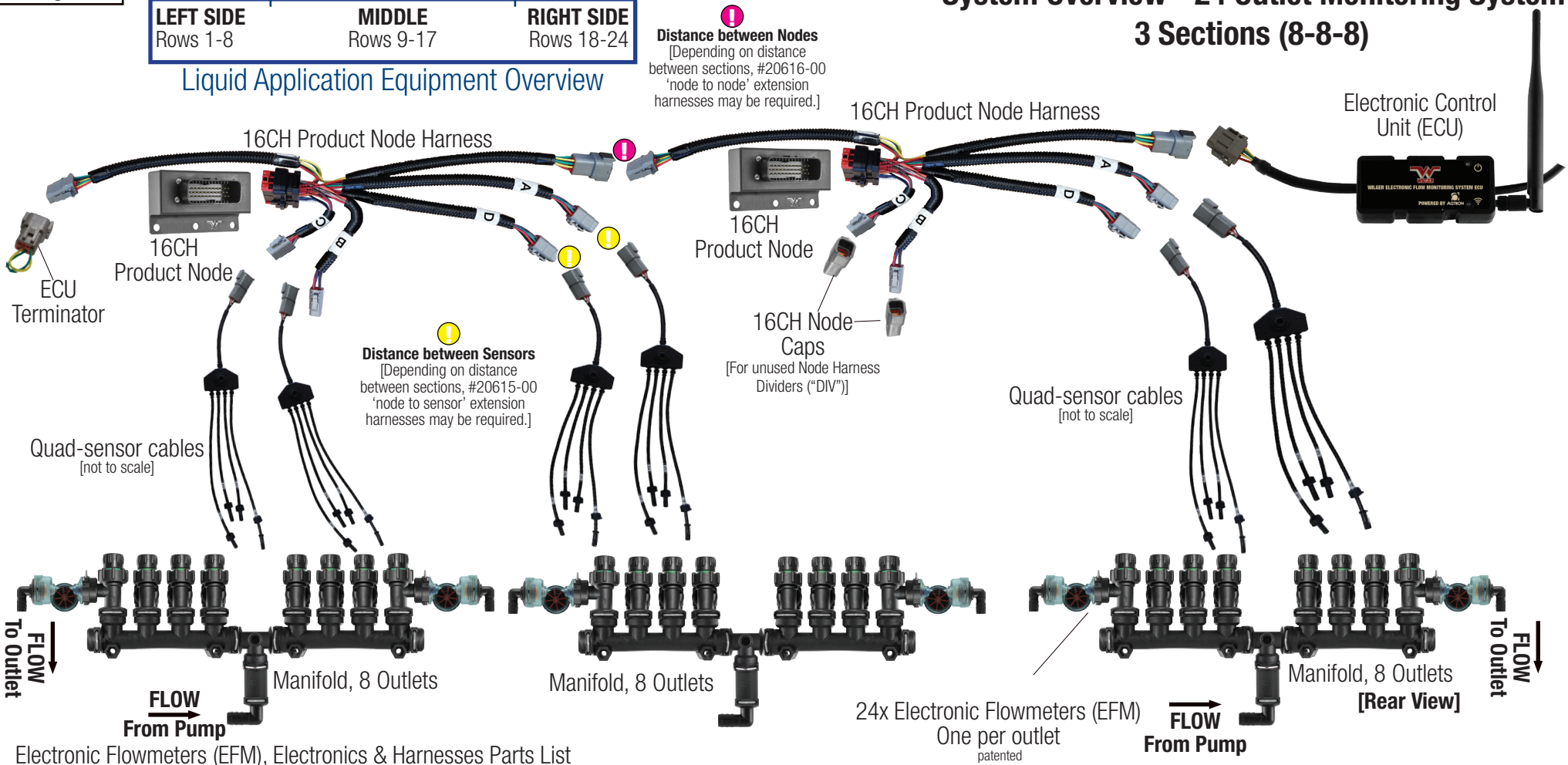


# System Overview - 24 Outlet Monitoring System 3 Sections (8-8-8)



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
2	20621-00	16CH Node Kit	incl. 16CH Node, 16CH Node Harness, 4x Quad-sensor cable
0		Sensor Cap	[Used for single sensor that will not be used]
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
6	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
3	20576-00	ORS Manifold Strainer	One strainer per Manifold Feed.
6	20521-00	ORS Manifold End-cap	Two used per center-fed manifold.
3	20526-00	ORS TEE w/ 1/4" NPT-F*	*1/4" NPT Port comes sealed; must be drilled out to be used.
3	205XX-00	ORS Inlet Fitting	ORS Inlet must be selected from catalog by preference (up to 1").
24	205XX-00	ORS Outlet Fitting	ORS Outlet must be selected from catalog by preference.
24	21500-VXX	ORS Metering Orifice	ORS metering orifice size must be selected by required flow rate.



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. <b>24 Outlet EFM Plumbing Manifold Assembly Overview</b>	Rev. 1 Nov 21/19
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Item Description **Flow Monitoring Manifold System, 24 Total Outlets ORS Manifold Plumbing, 3 Section Layout (8-8-8)**



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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.

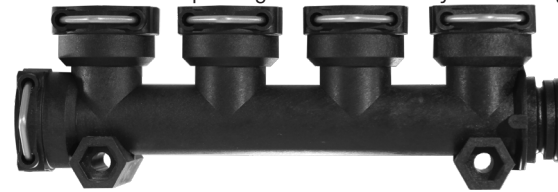
**ORS Outlet/Inlet Fittings**

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.



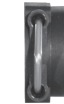
**ORS Manifolds** [not to scale]

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.



**[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



Manifold, 8 Outlets



**[Back View]**  
No sensor cable

Part No. EFM Plumbing Manifold, 8 Outlet

Rev. 1  
Nov 21/19

Item Description Flow Monitoring Manifold System, 24 Total Outlets  
ORS Manifold Plumbing, 3 Section Layout



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# Electronics Breakdown, [Up to 32 Total Sensors]

## 24 Outlets, 3 Section (8-8-8)

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

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

### Product Node 2 Harness

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

8-pin Node Connection  
 - from Node 1 to Node 2 -

ECU Terminator

Product Node 2

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

6-pin Quad-Sensor Cable Connections

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

Quad-Sensor Cable

ECU Antenna (50')

8-pin Node Connection  
 - from ECU -

Electronic Control Unit (ECU)

12V Power  
 20' Battery Harness (included, not shown)

Product Node 1

Product Node 1 Harness



16CH Node Harness Cover Cap [6-pin]

6-pin Quad-Sensor Cable Connections

Part No. EFM Plumbing Manifold, Electronics Breakdown	Rev. 1 Nov 21/19
Item Description Flow Monitoring Manifold System, 24 Total Outlets ORS Manifold Plumbing, 3 Section Layout (8-8-8)	



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**Extension Harness are also available [not shown]**  
**12' Node to Node Extension Harnesses [8-pin] #20616-00**  
**6' Node to Quad-Sensor Cable Extension Harnesses [6-pin] #20615-00**



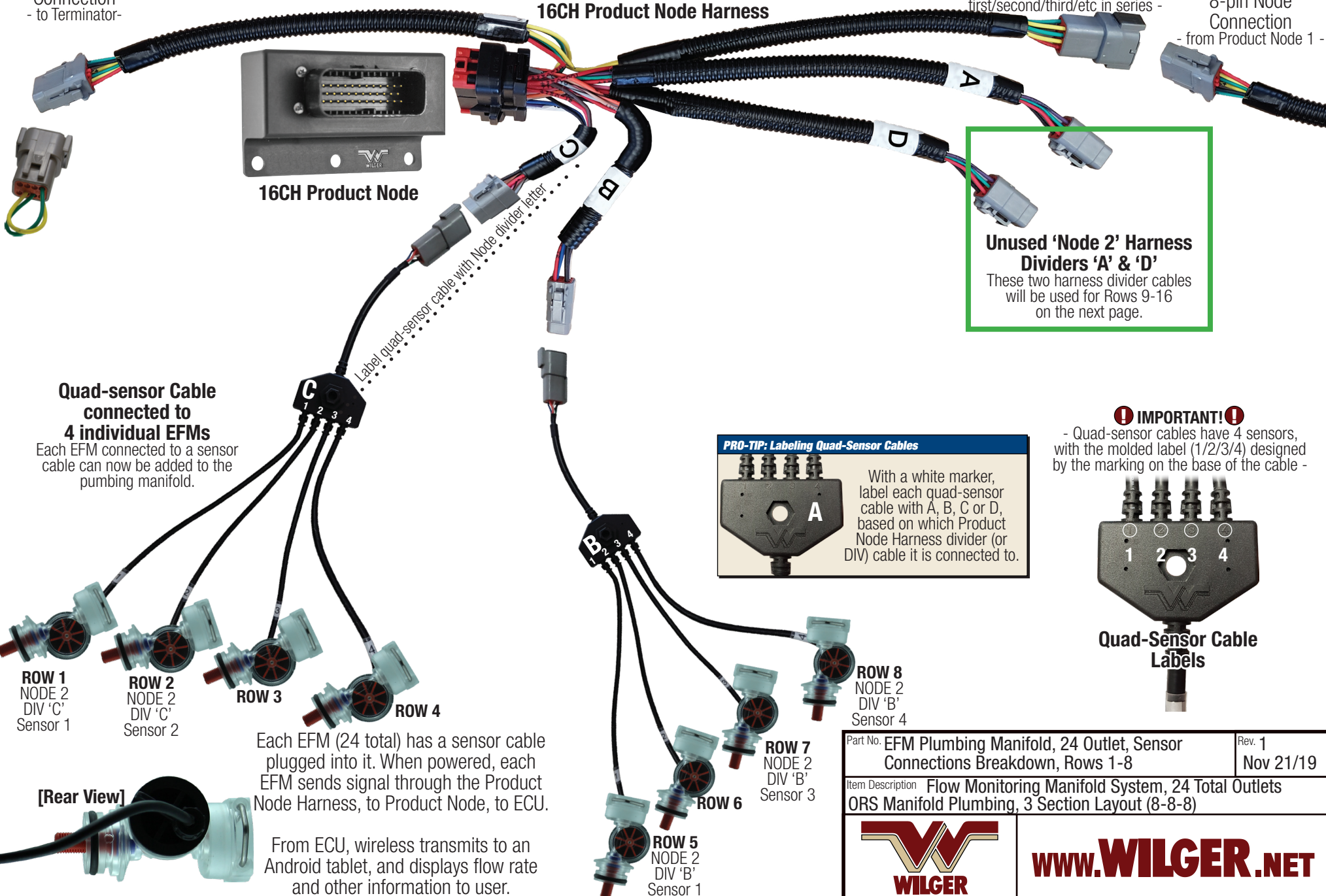
# Sensor Connections Breakdown - 8 Outlet Manifold; Section 1: Rows 1-8

Product Node Number(s) Used in this Section: **NODE 2**

8-pin Node Connection  
- to 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 Product Node 1 -



**16CH Product Node**

**16CH Product Node Harness**

**Unused 'Node 2' Harness Dividers 'A' & 'D'**

These two harness divider cables will be used for Rows 9-16 on the next page.

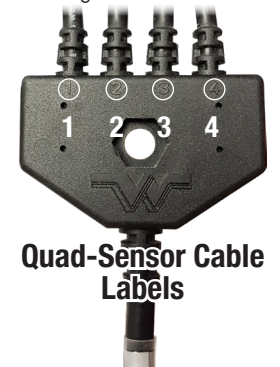
**Quad-sensor Cable connected to 4 individual EFMs**

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

**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 divider (or DIV) cable it is connected to.

**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**

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.

**ROW 1**  
NODE 2  
DIV 'C'  
Sensor 1

**ROW 2**  
NODE 2  
DIV 'C'  
Sensor 2

**ROW 3**

**ROW 4**

**ROW 8**  
NODE 2  
DIV 'B'  
Sensor 4

**ROW 7**  
NODE 2  
DIV 'B'  
Sensor 3

**ROW 6**

**ROW 5**  
NODE 2  
DIV 'B'  
Sensor 1

[Rear View]

Part No. EFM Plumbing Manifold, 24 Outlet, Sensor Connections Breakdown, Rows 1-8	Rev. 1 Nov 21/19
Item Description Flow Monitoring Manifold System, 24 Total Outlets ORS Manifold Plumbing, 3 Section Layout (8-8-8)	
	
	

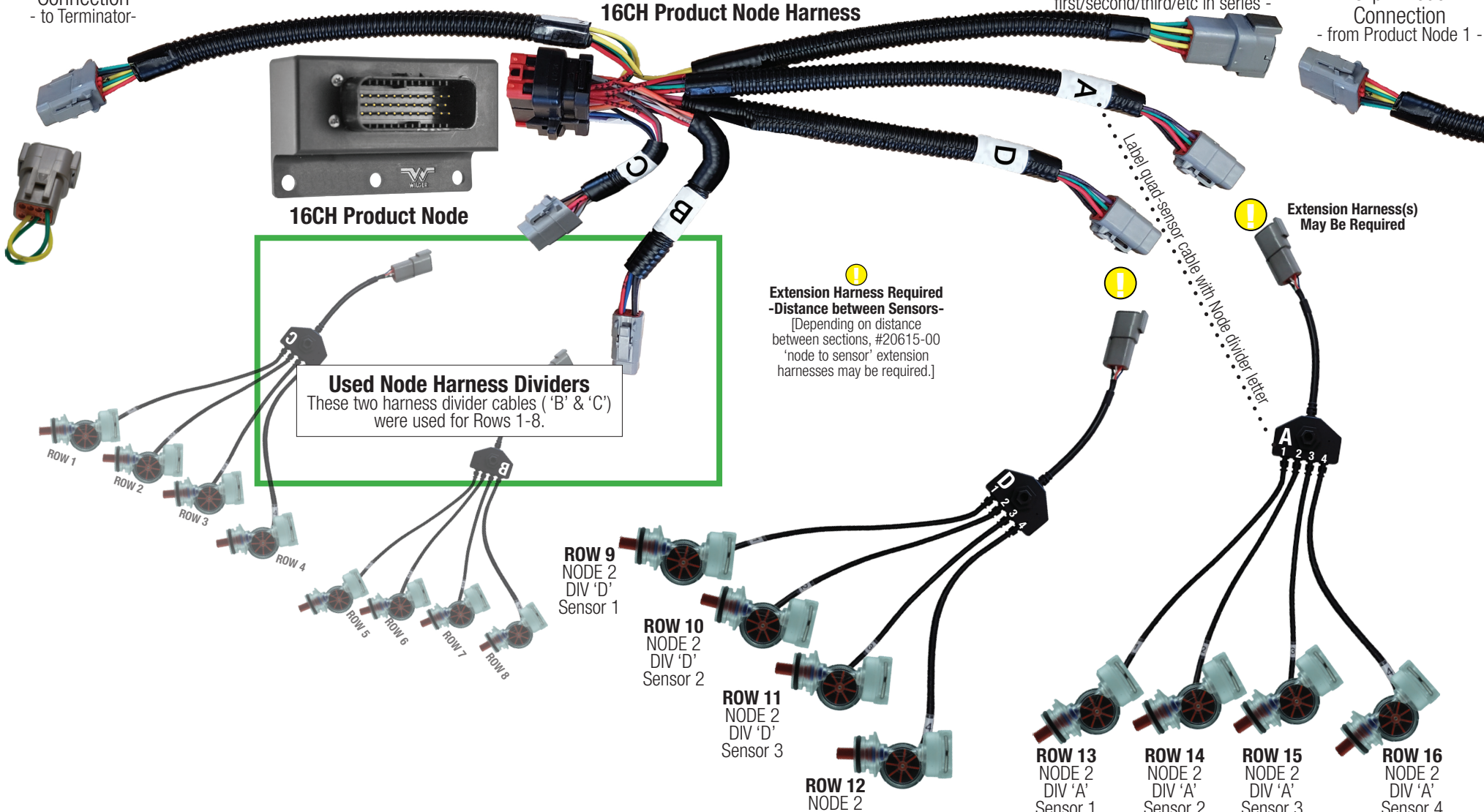
# Sensor Connections Breakdown - 8 Outlet Manifold; Section 2: Rows 9-16

Product Node Number(s) Used in this Section: **NODE 2**

8-pin Node Connection  
- to Terminator-

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

8-pin Node Connection  
- from Product Node 1 -



**16CH Product Node**

**16CH Product Node Harness**

**Used Node Harness Dividers**  
These two harness divider cables ('B' & 'C') were used for Rows 1-8.

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

**Extension Harness(s) May Be Required**

Label quad-sensor cable with Node divider letter...

ROW 1  
ROW 2  
ROW 3  
ROW 4

**ROW 9**  
NODE 2  
DIV 'D'  
Sensor 1

**ROW 10**  
NODE 2  
DIV 'D'  
Sensor 2

**ROW 11**  
NODE 2  
DIV 'D'  
Sensor 3

**ROW 12**  
NODE 2  
DIV 'D'  
Sensor 4

**ROW 13**  
NODE 2  
DIV 'A'  
Sensor 1

**ROW 14**  
NODE 2  
DIV 'A'  
Sensor 2

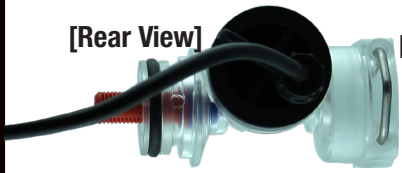
**ROW 15**  
NODE 2  
DIV 'A'  
Sensor 3

**ROW 16**  
NODE 2  
DIV 'A'  
Sensor 4

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.

[Rear View]



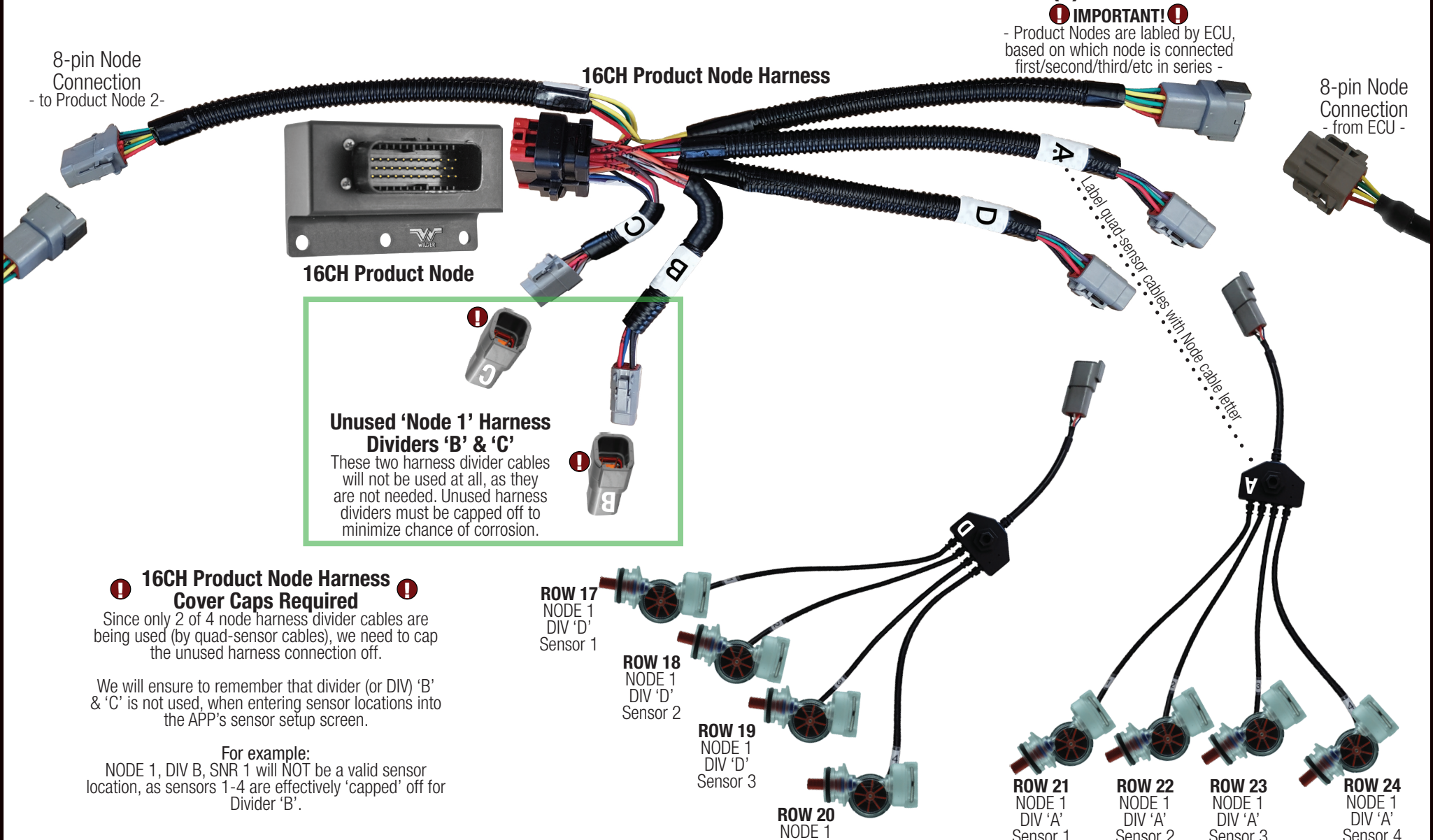
Part No. EFM Plumbing Manifold, 24 Outlet, Sensor Connections Breakdown, Rows 9-16	Rev. 1 Nov 21/19
Item Description Flow Monitoring Manifold System, 24 Total Outlets ORS Manifold Plumbing, 3 Section Layout (8-8-8)	



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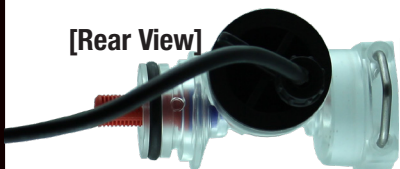
# Sensor Connections Breakdown - 8 Outlet Manifold; Section 3: Rows 17-24 Product Node Number(s) Used in this Section: NODE 1



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.

[Rear View]





Part No. EFM Plumbing Manifold, 24 Outlet, Sensor Connections Breakdown, Rows 17-24	Rev. 1 Nov 21/19
Item Description Flow Monitoring Manifold System, 24 Total Outlets ORS Manifold Plumbing, 3 Section Layout (8-8-8)	



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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 Android APP - Outlets 1-24 on Single Product Screen [PRODUCT NODE 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. For simplicity, for a 24 outlet implement, it will be shown as two 'sections' based on the manifold size, of 12 Outlets each.

### "Section 2": 8 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	2	C	1	9	2	D	1	17	1	D	1
2	2	C	2	10	2	D	2	18	1	D	2
3	2	C	3	11	2	D	3	19	1	D	3
4	2	C	4	12	2	D	4	20	1	D	4
5	2	B	1	13	1	A	1	21	1	A	1
6	2	B	2	14	1	A	2	22	1	A	2
7	2	B	3	15	1	A	3	23	1	A	3
8	2	B	4	16	1	A	4	24	1		

#### How to Read the Sensor Location (Eg. Location 1A2)

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/Row 14** is connected to **SENSOR 2** or **[SNR 2]** on the quad-sensor cable, connected to the **Node Harness Cable 'A'** or **[DIV A]**, 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 App, 24 Outlet, 3 Section (8-8-8) Sensor Connections Breakdown, APP v2.6.1	Rev. 1 Nov 21/19
Item Description Flow Monitoring Manifold System, 24 Total Outlets ORS Manifold Plumbing, 2 Section Layout	



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