

sure  **cross**TM
wireless network

sensing unplugged.



more sensors, more solutions

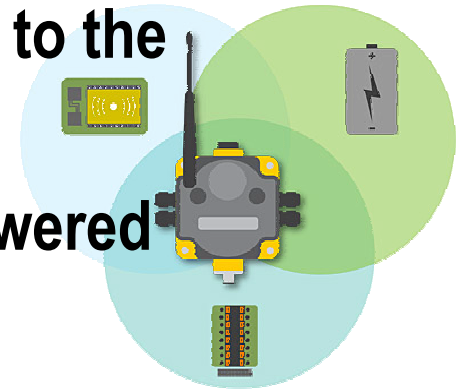
www.bannerengineering.com/wireless
www.frontierfertilizer.com/
www.redlion.net/





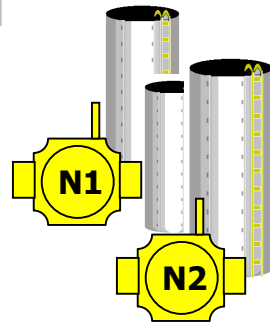
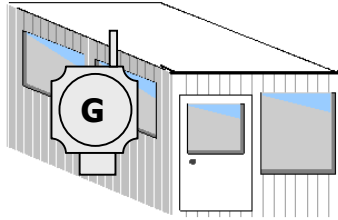
Frontier Fertilizer Tank Monitoring

- The purpose of this document is to plan the implementation of tank monitoring at the Frontier Fertilizer LLC.
- Application consists of 10 tanks that will have a pressure transmitter that will correspond to the amount of material in the tank.
- Each tank will have one wireless Flex-Powered node.
- The Operations Building will house the wireless gateway and the RedLion DataStation Plus (DSP) device.



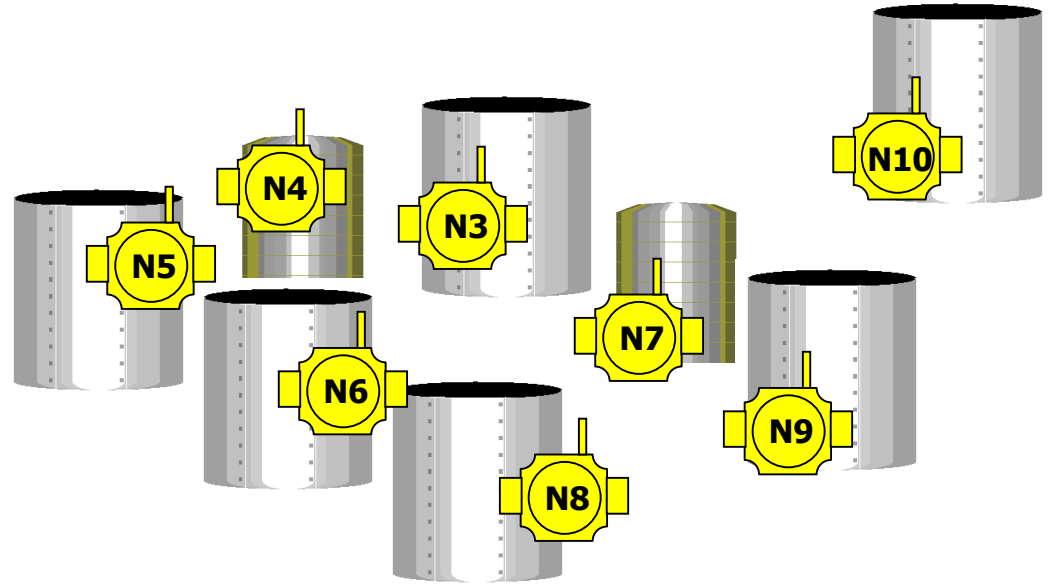


Frontier Fertilizer Tank Monitoring



Tank Layout

Node#





Frontier Fertilizer Tank Monitoring

■ Site Survey Measurements

TANK 1		GREEN	YELLOW	Red	Missed
4/3/2007	10:12:43	77	23	0	0
4/3/2007	10:12:44	76	24	0	0
4/3/2007	10:12:45	77	22	0	1
4/3/2007	10:12:46	75	24	0	1
4/3/2007	10:12:47	77	22	0	1
		76.4	23	0	0.6
TANK 2		GREEN	YELLOW	Red	Missed
4/3/2007	10:12:58	10	75	4	11
4/3/2007	10:12:59	9	77	4	10
4/3/2007	10:13:00	10	75	5	10
4/3/2007	10:13:01	10	75	7	8
4/3/2007	10:13:02	9	75	7	9
		9.6	75.4	5.4	9.6
TANK 3		GREEN	YELLOW	Red	Missed
4/3/2007	10:13:48	10	75	11	4
4/3/2007	10:13:49	7	78	11	4
4/3/2007	10:13:50	5	79	11	5
4/3/2007	10:13:51	3	81	10	6
4/3/2007	10:13:52	2	83	10	5
		5.4	79.2	10.6	4.8



Frontier Fertilizer Tank Monitoring

■ Site Survey Measurements - continued

TANK 4		GREEN	YELLOW	Red	Missed
4/3/2007	10:14:08	5	71	12	12
4/3/2007	10:14:09	6	71	11	12
4/3/2007	10:14:10	5	70	13	12
4/3/2007	10:14:11	2	73	14	11
4/3/2007	10:14:12	2	74	13	11
		4	71.8	12.6	11.6
TANK 5		GREEN	YELLOW	Red	Missed
4/3/2007	10:14:21	12	73	10	5
4/3/2007	10:14:22	12	69	11	8
4/3/2007	10:14:23	12	70	8	10
4/3/2007	10:14:24	10	71	9	10
4/3/2007	10:14:25	7	74	8	11
		10.6	71.4	9.2	8.8
TANK 6		GREEN	YELLOW	Red	Missed
4/3/2007	10:14:30	6	76	8	10
4/3/2007	10:14:31	7	73	8	12
4/3/2007	10:14:32	7	71	9	13
4/3/2007	10:14:33	7	70	11	12
4/3/2007	10:14:34	8	70	7	15
		7	72	8.6	12.4



Frontier Fertilizer Tank Monitoring

■ Site Survey Measurements - continued

TANK 7		GREEN	YELLOW	Red	Missed
4/3/2007	10:14:57	4	79	7	10
4/3/2007	10:14:58	3	76	9	12
4/3/2007	10:14:59	2	71	16	11
4/3/2007	10:15:00	2	71	16	11
4/3/2007	10:15:01	2	68	18	12
		2.6	73	13.2	11.2
TANK 8		GREEN	YELLOW	Red	Missed
4/3/2007	10:15:32	0	25	31	44
4/3/2007	10:15:33	0	23	36	41
4/3/2007	10:15:34	0	24	33	43
4/3/2007	10:15:35	0	21	36	43
4/3/2007	10:15:36	0	18	40	42
		0	22.2	35.2	42.6
TANK 9		GREEN	YELLOW	Red	Missed
4/3/2007	10:16:28	0	46	27	27
4/3/2007	10:16:29	0	45	26	29
4/3/2007	10:16:30	0	46	26	28
4/3/2007	10:16:31	0	48	23	29
4/3/2007	10:16:32	0	44	27	29
		0	45.8	25.8	28.4



Frontier Fertilizer Tank Monitoring

■ Site Survey Measurements - continued

TANK 10			GREEN	YELLOW	Red	Missed
4/3/2007	10:16:48		0	0	17	83
4/3/2007	10:16:49		0	0	19	81
4/3/2007	10:16:50		0	0	19	81
4/3/2007	10:16:51		0	0	22	78
4/3/2007	10:16:52		0	3	22	75
			0	0.6	19.8	79.6



Frontier Fertilizer Tank Monitoring

■ Bill of Material

Frontier Fertilizer			
Intitial Bill of Materials to start project			
Item	Qty	Part Number	Description
A	1	DSPGT000	RedLion DataStation Plus w/ 640x480
B	1	DX80G9M6S4P4	Banner Wireless Gateway w/ 4DI4DO
C	1	DX80N9X2S2N2M2X	Banner Wireless Flex Node w 2DI/2AI/2DO
D	1	DX81	Banner Wireless Battery Pack
E	1	BWC-4MNFN15	Banner Wireless LMR400 N Male to N Female Antanna cable 15meter
F	1	RS-SNT-55W	TURCK Power Supply 24Vdc 2.3Amp
G	1	RJ45 840-2M	TURCK RJ45 cable for ModbusRTU from Wireless Gateway to DSP
H	1	RJ45 RJ45 440-2M	TURCK RJ45 cordset Ethernet 2M
Each Future Node will need the items listed below			
Item	Qty	Part Number	Description
I	1	DX80N9X2S2N2M2X	Banner Wireless Flex Node w 2DI/2AI/2DO
J	1	DX81	Banner Wireless Battery Pack
NOTE: Does not include the sensor devices, only the Wireless I/O and the DataStation Plus			



Frontier Fertilizer Tank Monitoring

- Pictures of job site





Frontier Fertilizer Tank Monitoring

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