

Houston SPI-LTUF



A Rockwell Automation Company

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DOCUMENTING WIRELESS LOOPS IN SPI 2013

FROM AN OWNER OPERATOR'S
PERSPECTIVE



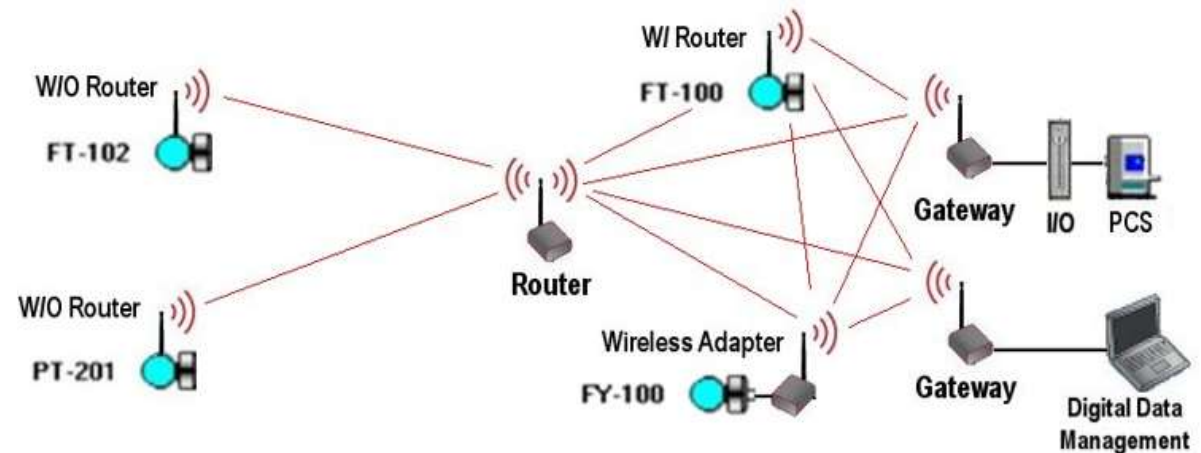
PROBLEM: A WIRING SOFTWARE TOOL (SPI) FOR A WIRELESS SYSTEM

- WIRELESS IS MAKING MAJOR INROADS INTO EVERY INDUSTRY SECTOR REPLACING MANY WIRED DEVICES WITH WIRELESS NETWORKS - AND THEY NEED DOCUMENTATION.
- WIRED SYSTEMS AND THE DATABASE TOOLS USED TO DOCUMENT THEM ARE VERY ENTRENCHED IN THEIR RESPECTIVE INSTALLED BASES WORLD-WIDE.
- SPI USERS ARE SEARCHING FOR VARIOUS METHODS TO UTILIZE THE EXISTING SOFTWARE TO DOCUMENT WIRELESS DEVICES, NETWORKS AND SYSTEMS WITHOUT A TOTAL PROGRAM RE-WRITE OR HIGHLY SPECIALIZED SCRIPTS/PROGRAMMING (THE TELECOM MODULE IS STILL INSUFFICIENT)
- SMARTPLANT INSTRUMENTATION (**NOW SMART INSTRUMENTATION**) WAS NOT ORIGINALLY DESIGNED FOR WIRELESS SIMULATION AND ITS ORIGINS PREDATE THE ADVENT OF WIRELESS SYSTEMS FOR GLOBAL INDUSTRY APPLICATIONS.
- DEVELOPING A FUNCTIONAL SYSTEM FOR DOCUMENTING WIRELESS SYSTEMS IN SI AND TEACHING OTHERS TO USE IT IN A UNIFORMLY ACCEPTED MANNER.



DOCUMENTING WIRELESS LOOPS IN SPI 2013

- PROBLEMATIC REPRESENTATION ISSUES INCLUDE:
 - SIGNAL PROPAGATION
 - SYMBOLOGY
 - INSTRUMENT PROFILES
 - DATA MAPPING ISSUES
 - LOTS OF SPECIAL PRE-BUILD WORK INCLUDING PROFILES, CABLES, BROWSERS, SYMBOLS, STANDARDS, ETC.
- **BASICALLY WE ARE FOOLING SPI TO GET THE DESIRED RESULT**



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FRONT END LOADING (pre-work) REQUIREMENTS FOR SPI WIRELESS SETUP:

- PREFERENCES PRESET PER COMPANY STANDARDS
- TAG NAMING CONVENTIONS DEFINED FOR WIRELESS SYSTEMS
- LOOP LAYOUTS PREDEFINED AND SETTINGS DEFINED AND SAVED
- REFERENCE EXPLORER COMPONENTS PRE-BUILT (DEVICE PANELS, ETC.)
- PRE-BUILT CABLES TO SIMULATE A NETWORK FOR CONNECTOR ASSIGNMENT
- PRE-BUILT CONNECTORS FOR CABLE ASSIGNMENT – NAMED “SPARE XX”
- PRE-BUILT GATEWAY AND I/O CARDS UNDER THE DCS PANEL STRUCTURE
- ADDITIONAL I/O TYPES FOR WIRELESS DEVICES (e.g. AI-W, DI-W, ETC.)
- GATEWAY SYMBOLS PRE-ASSIGNED TO TERMINALS ON DEVICE PANELS
- BROWSERS CREATED FOR DATA ENTRY ON THE FINISHED ENHANCED REPORT.
- **NOTE: OWNER OPERATORS HAVE MORE CONTROL OVER THIS THAN EPCs**



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TAG NAMING CONVENTION EXAMPLE:

4.3. Component Convention

Example: 4500PDSHH12345AB or 4500PDSHH01234AB

<u>Description</u>	<u>Separator</u>	<u># of Characters</u>	<u>Example</u>
Unit Number Identifier		4	4500
Instrument Type		5	PDSHH
Loop Number		5	12345
Component SUFFIX		2	AB
WIRELESS		1	W

For all tags with less than 5-digit loop numbers add leading zeros.

Example: 4500FX00012 / 4500FX00123 / 4500FX01234 /
4500FX12345ABW / 4500FX12345A W / 4500P12345 W

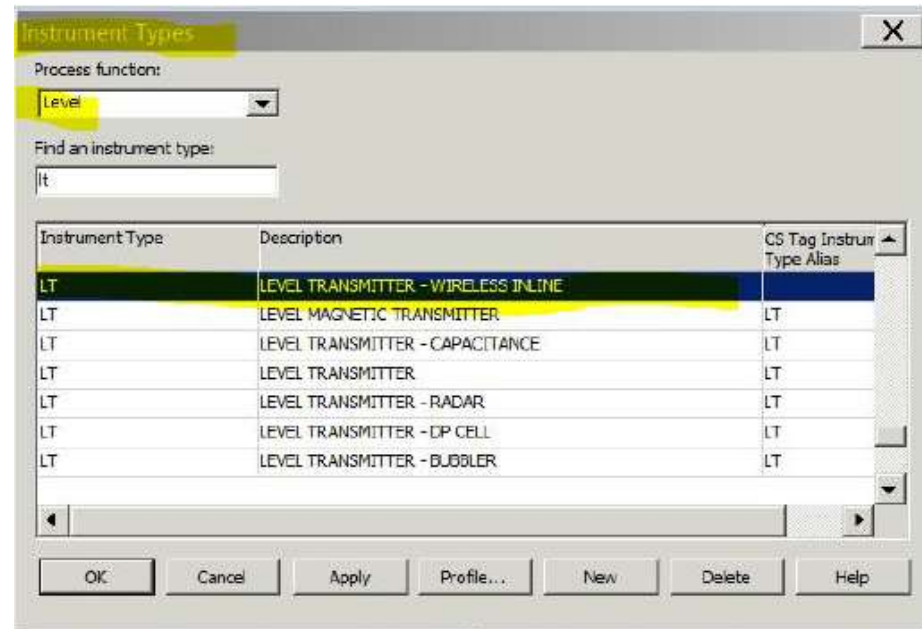


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REFERENCE EXPLORER DEVICE PANELS AND INSTRUMENT TYPE PROFILES:

1 = DEVICE PANEL, 2 = APPARATUS

- .. ●+ OWA 100 WIRELESS (UU)
- .. ●+ VEGA DIS 81 (LI) 1
- .. ●+ VEGA DIS 81 (LI) 2
- .. ●+ VEGA PS62 (LT) 1
- .. ●+ VEGA PS62 (LT) 2
- .. ●+ WIRELESS XT INLINE
- .. ●+ WIRELESS XT INLINE



PRESSURE, LEVEL, TEMPERATURE AND FLOW



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I/O TYPES DEFINED:

5.2. SPI Instrument Index System I/O Types

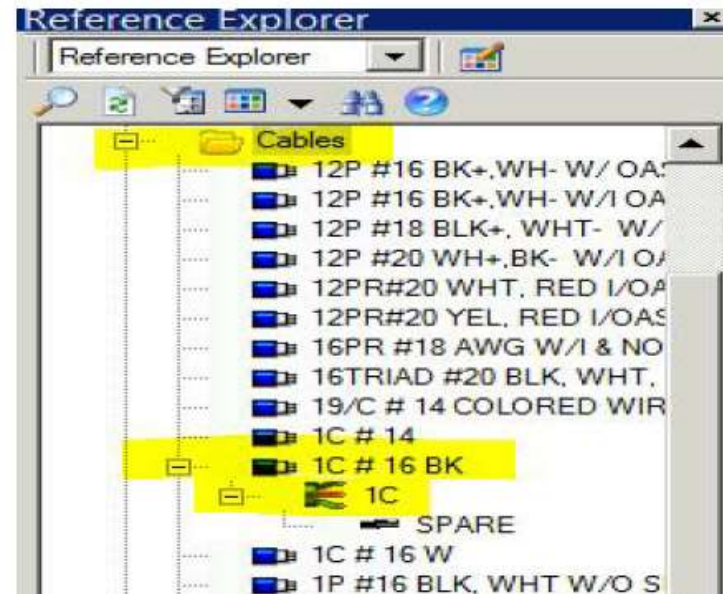
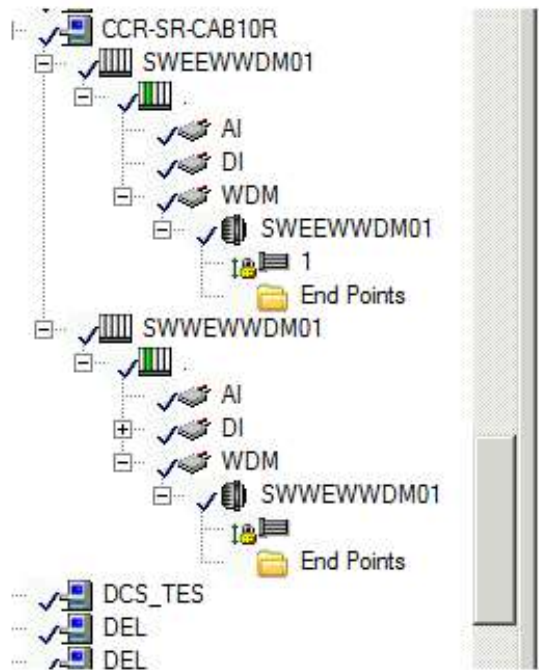
The following table shows the I/O codes and descriptions used in the Instrument Index for the Refinery. These will be used for all signals between the control system components and field instruments on the project:

I/O TYPE	I/O TYPE DESCRIPTION
AI-BMS	Analog Input to Burner Management System
AI-W	Wireless Analog Input to DCS
AO-BMS	Analog Output from Burner Management System
AO-BN	Analog Output from Bentley Nevada
DI-SIS	Digital Input to SIS
DI-SM	Digital Input to Safety Manager
DI-W	Wireless Digital Input to DCS
DO-BMS	Digital Output from Burner Management System



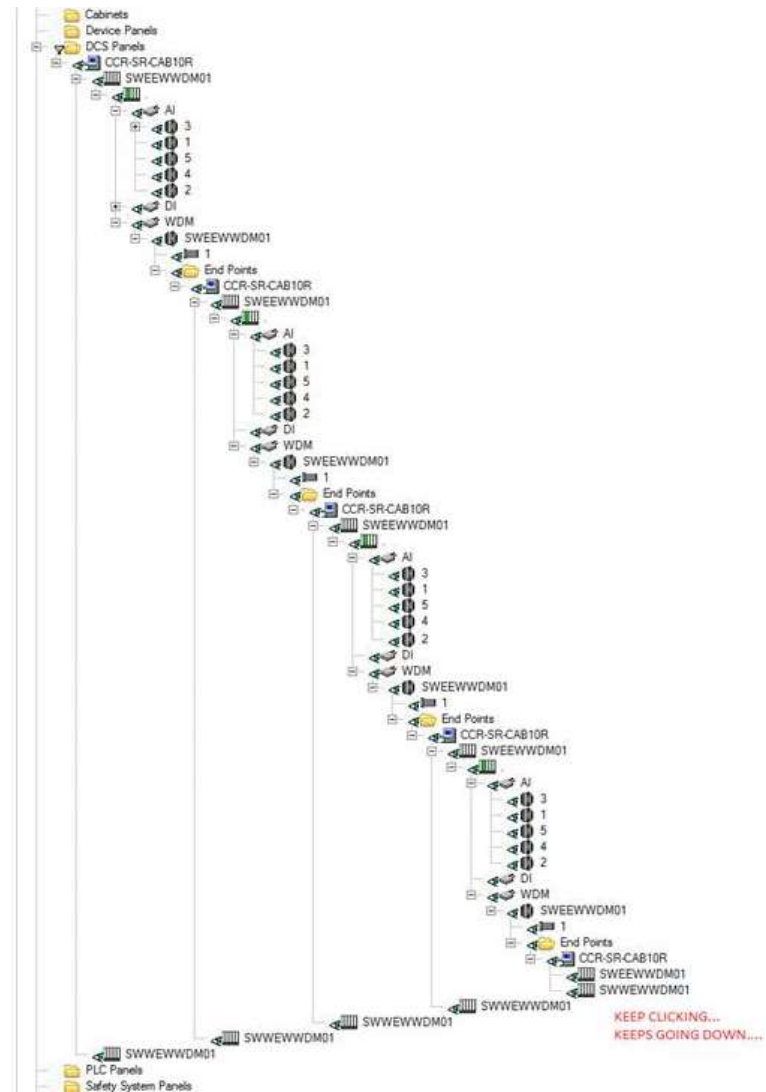
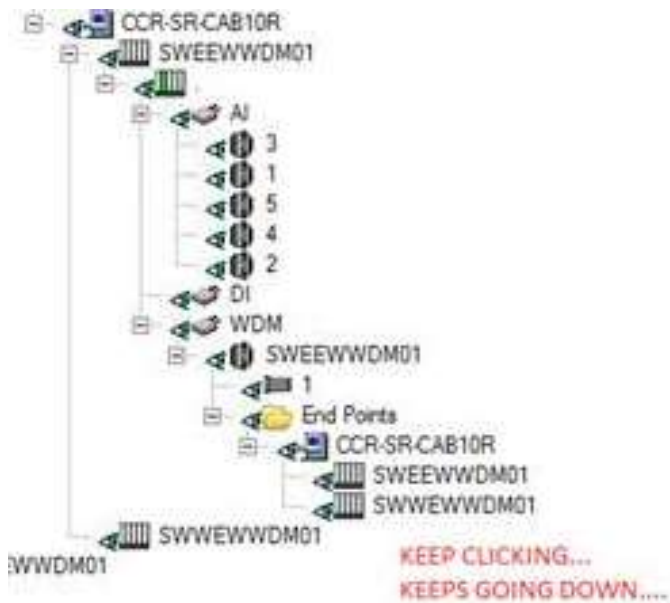
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PRE-BUILD I/O CARDS AND GATEWAYS AND REFERENCE EXPLORER CABLES:



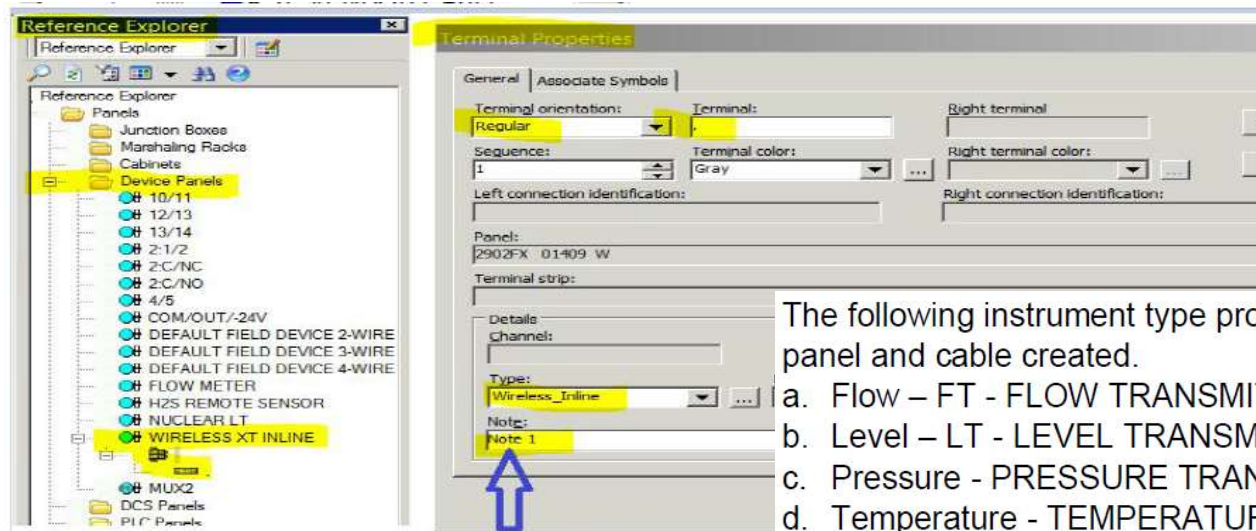
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A WEIRD EXAMPLE OF A PROGRAMMING LOOP



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DEVICE PANELS TERMINAL PROPERTIES, NOTES, ETC.:



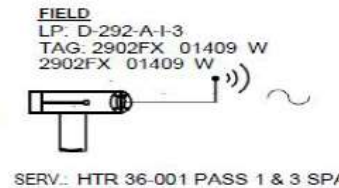
The following instrument type profile will automatically have the correct device panel and cable created.

- Flow – FT - FLOW TRANSMITTER - WIRELESS INLINE
- Level – LT - LEVEL TRANSMITTER - WIRELESS INLINE
- Pressure - PRESSURE TRANSMITTER - WIRELESS INLINE
- Temperature - TEMPERATURE TRANSMITTER - WIRELESS INLINE

if you have any note for the transmitter, like battery info, put "Note 1" here

NOTES:
CONNECT AND TERMINATE INSTRUMENT CABLE SHIELDS AT CASE GROUND OF WIRELESS TRANSMITTER.
1. UNIT IS A BATTERY POWERED INCLUDES A SELF DIAGNOSTIC "LOW BATTERY ALARM" THAT IS TRANSMITTED ALONG WITH PV VALUES.

Note 1



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MACRO ASSIGNMENTS

FOR "PANEL" MACRO TYPE USE "SW REF. DWG FOR {PANELS}" BROWSER

FOR "DIR OR ACT;" AND "CS TAG DESC." FIELDS USE "SW CS TAG DESC." BROWSER

FOR "TERMINAL STRIP" MACRO TYPE USE "WD: STRIP SAP DRAWINGS No." BROWSER

FOR "TERMINAL STRIP" MACRO TYPE FOR FTAs USE "LOOP WD FTA STRIP" BROWSER

Browser Manager
Browser groups
Wiring
Auto-Wiring Routing Task Browser
Cable Browser
Cable Set Browser
Device Panel Browser
General Panel Browser
3800 Panels
AJAJ
DNCD
J6 LIST FROM SPT
CPI MIGRATION PANEL LIST
SW REF. DWG FOR {PANELS}
david
unit 11 swe ref. dg panels .Jos

Macro definition
Macro type: Panel
Relation:
Macro: Panel Custom Field 01

Browser Manager
Browser groups
Control System
NIM General Browser
Control System Tag Browser
BMCD
CW CS Tag
New Contr of System Tag
New Control System Tag
SPT Compare
SW CS TAG DESC. DO NOT MOD

Browser Manager
Browser groups
Wiring
Auto-Wiring Routing Task Browser
Cable Browser
Cable Set Browser
Device Panel Browser
General Panel Browser
I/O Card Browser
DOUG I/O Card
LOOP WD FTA STRIP
New I/O Card

Browser Manager
Browser groups
Wiring
Auto-Wiring Routing Task Browser
Cable Browser
Cable Set Browser
Device Panel Browser
General Panel Browser
I/O Terminal Browser
Local Signal Browser
Rack Browser
Segment Assignment
Slot Browser
Strip Browser
3800 Stripes
WD: STRIP SAP DRAWINGS No.
david

Macro definition
Macro type: Terminal Strip
Relation:
Macro: Custom Field 001

Macro definition
Macro type: Drawing Strip
Relation:
Macro: Custom Field 001

Macro definition
Macro type: Drawing Strip
Relation:
Macro: Custom Field 001

NOTES:

INSTRUMENT LOOP DIAGRAM
LOOP NAME: 3700 FRAKES
RAFFINATE TO H2O WASH COLUMN D-206
CRITICALITY:
SIS ID:
SIF:
D-007-VAR-08 P-00003
SAP. DWG No. SAP VER. REV

No.	By	Date	Revision	Chk.	App.	SIVA pp.

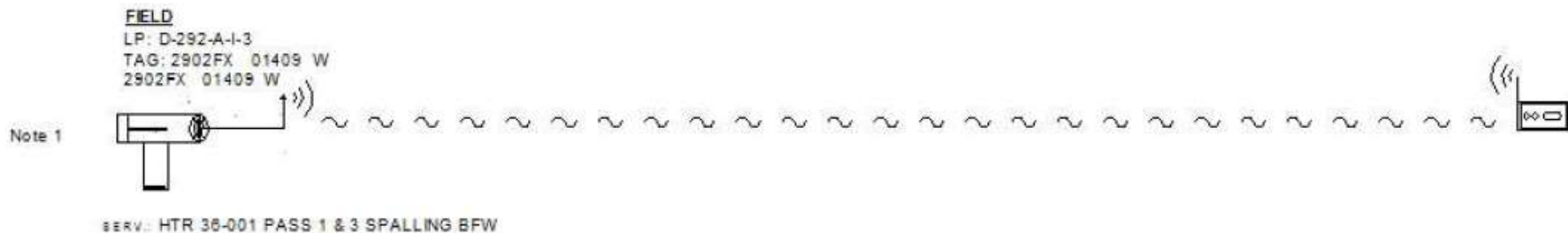
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DOCUMENTING WIRELESS LOOPS IN SPI 2013

ONCE THE OVERALL INFRASTRUCTURE IS SET UP YOU ARE READY FOR THE WORK PROCESS THAT WILL GIVE YOU THE DESIRED GRAPHIC RESULT.

- GATHER ALL NECESSARY SUPPORT DOCUMENTS – P&IDs, SPECS, INDEX, ILPs, Etc.
- DEFINE THE WIRELESS CONCEPT – NON-WIRED VS. WIRED FIELD SENSOR.
- ASSIGN THE LAYOUT, ADD NOTE AND VERIFY YOU LOOP PROFILES.
- IDENTIFY AND NAME “CABLE” CONNECTORS W/ “END 1 & END 2” ASSIGNMENTS.
- LOCATE DCS GATEWAYS & I/O CARDS AND TERMINATE THE CABLE CONNECTORS.
- MAKE SIGNAL CHANNEL I/O ASSIGNMENT AND RENAME THE CONNECTOR.
- **THE RESULTING GRAPHIC IS WHAT WE ARE LOOKING FOR (non-wired sensor).**



NOW LETS TAKE A QUICK
WALKTHROUGH THE ACTUAL CLIENT
TUTORIAL.

HANG ON TO YOUR SEAT!!!



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