

4310/4320 Wireless Position Monitor Burst Configuration and Diagnostics

This document applies to:

Fisher® 4320	Device Type 1308 (hex) 4872 (decimal)
TopWorx™ 4310	Device Type E0CE (hex) 57550 (decimal)
Device Revision	2
Firmware Revision	2
DD Revision	1, 3

This document will guide you through burst configuration and diagnostics using AMS Device Manager. Burst can be configured the same way using the 475 Field Communicator. Refer to the appropriate instruction manual [D103391X012 (4310) or D103392X012 (4320)], available from your Emerson Process Management sales office, or www.Fisher.com, for the Field Communicator menu trees.

Access burst configuration by selecting the *Broadcast Information* tab from *Configure, Manual Setup*.

For each *Burst Message* that represents a HART® command whose content can be modified (Commands 3, 9, or 178) the following menu items are available: *Enabled/Disabled*, *Message Content*, *Content Details*, *Trigger Details*, *Update Details*.

In each burst message configuration menu, the following items appear:

Enabled / Disabled—select On (*WirelessHART*®) to request network bandwidth allocation for this burst message. Select Off to disable this burst message and release bandwidth allocation back to the network.

Message Content—choose between:

- Primary Variable (HART command 1)
- PV %Range, Loop Current (command 2 - not recommended but available if a control system requires it)
- Dynamic Variables, Current (command 3)
- Selected Device Variables (command 9)
- Additional Device Status (command 48)
- Emerson Specific (command 178), (Press the HELP key for explanation)

Content Details—appears only if selected Message Content is user-configurable (commands 3, 9, and 178). You may assign the desired device variables to individual slots in the message. In the 'Selected Device Variables' choice, the first slot assignment becomes the trigger variable when a trigger mode other than Continuous or On-Change is used.

Trigger Details—select the trigger mode (Continuous, Windowed, Rising, Falling, or On-Change). Trigger class and units must also be selected when trigger mode is not Continuous. (Press the HELP key while at the Trigger Details menu item in the Burst Message menu for guidance).

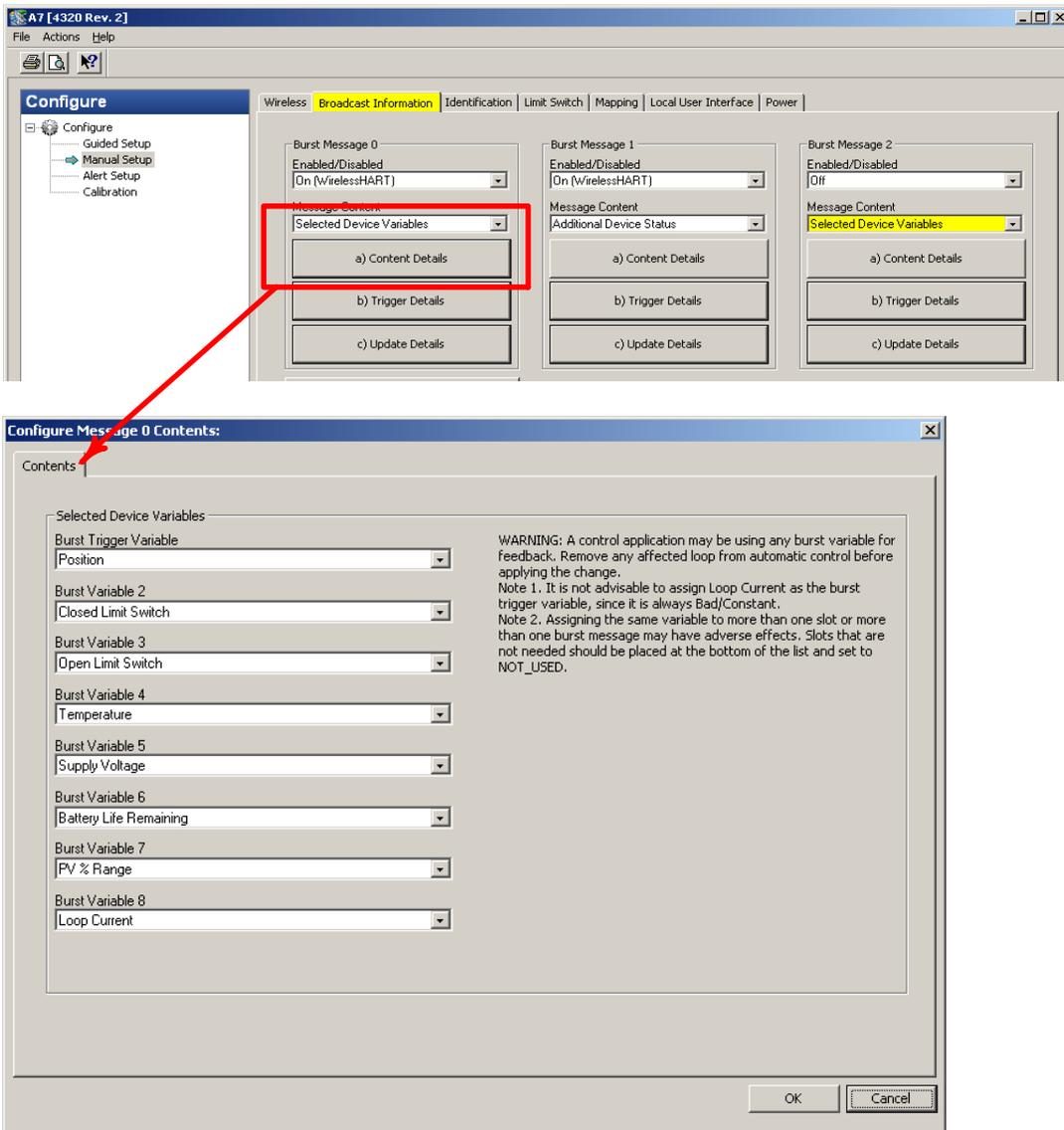
Update Details—this menu structure varies based on the *Message Content* and *Trigger Details* selections.



The HELP key provides guidance for each parameter. For Continuous trigger mode, only the Update Rate is presented. For On-Change, a Default Update Rate is added. For Windowed, Rising, and Falling, there is also a Trigger Level to configure. When the mode is other than Continuous, there is an option to enable and configure Delayed Triggering, which allows the device to sample the trigger variable faster than the Default Update Rate so that transitions are less likely to be missed.

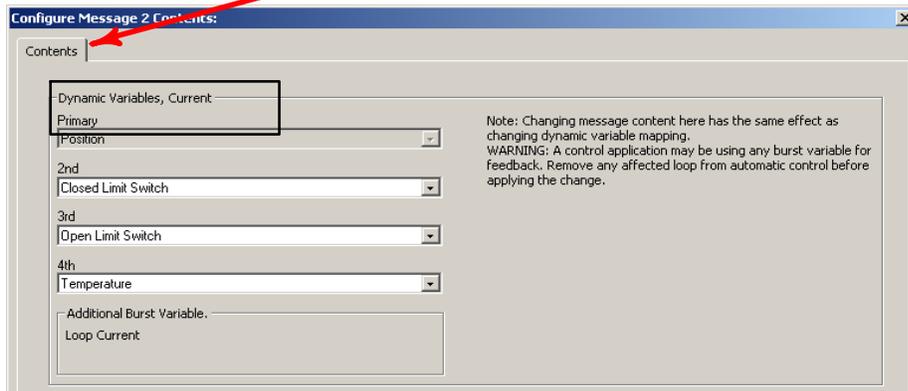
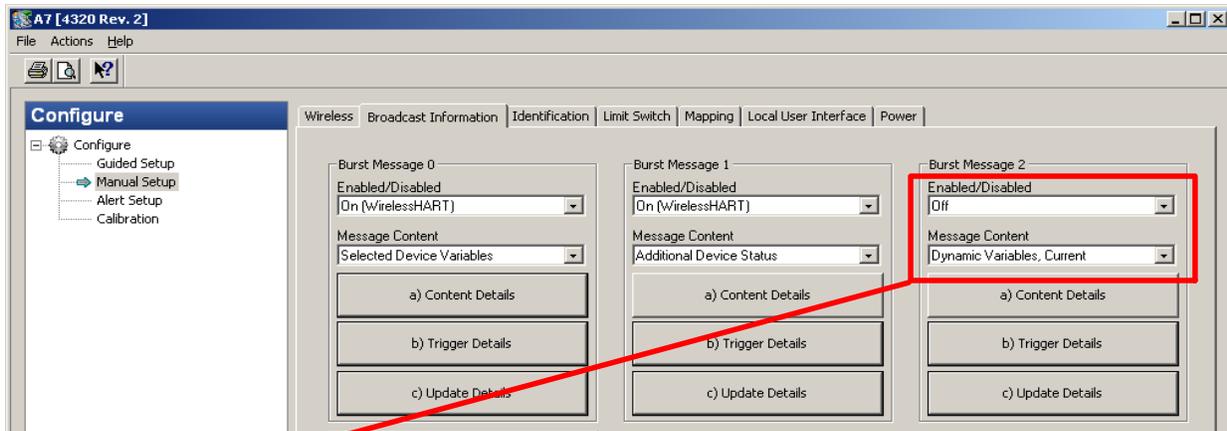
Message Content

Three of the Message Content choices allow the user to adjust the fine detail of the burst message contents. Selected Device Variables (Command 9) is one of those choices:

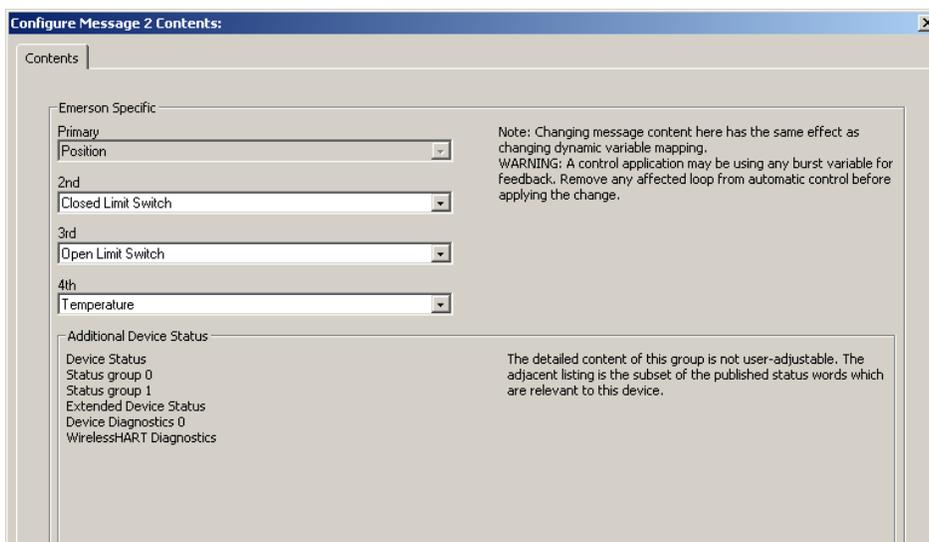


The variable placed in the first slot becomes the “trigger variable” when burst trigger modes other than *Continuous* or *On-Change* are selected.

Dynamic Variables and Current (Command 3) is the second:



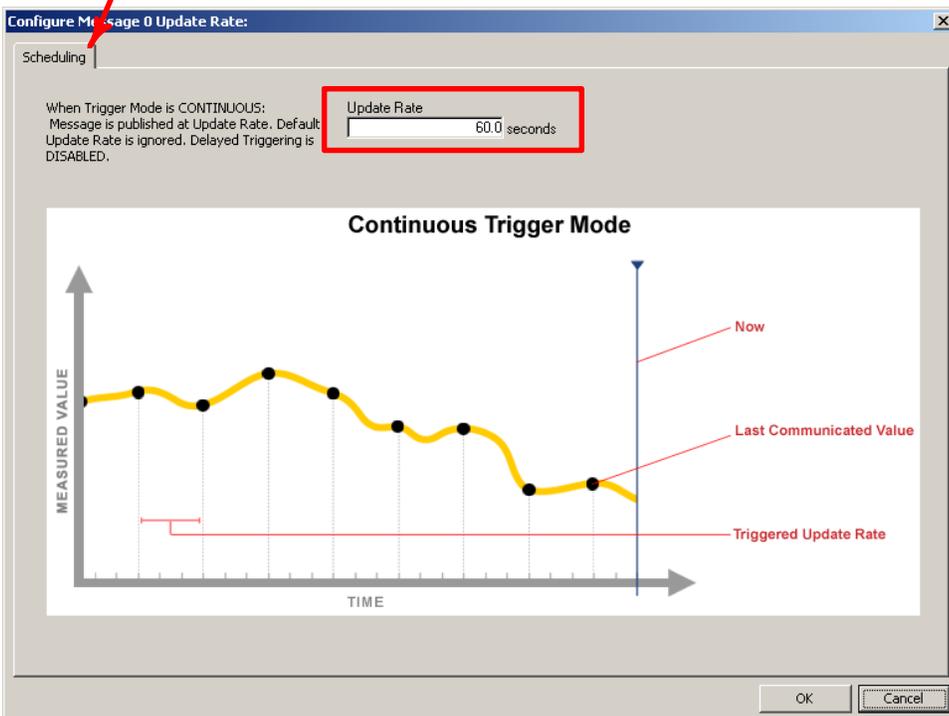
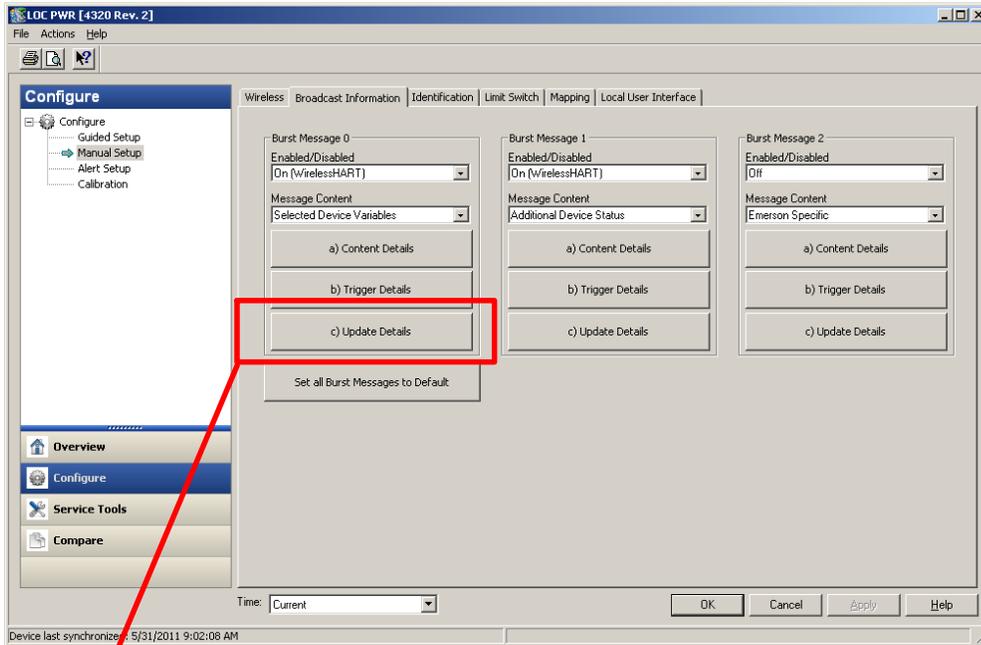
Emerson Specific (Command 178) is the third:



The trigger variable is fixed as the Primary Variable in these two cases.

Update Rate

To change the update rate for each message in Continuous Trigger Mode:

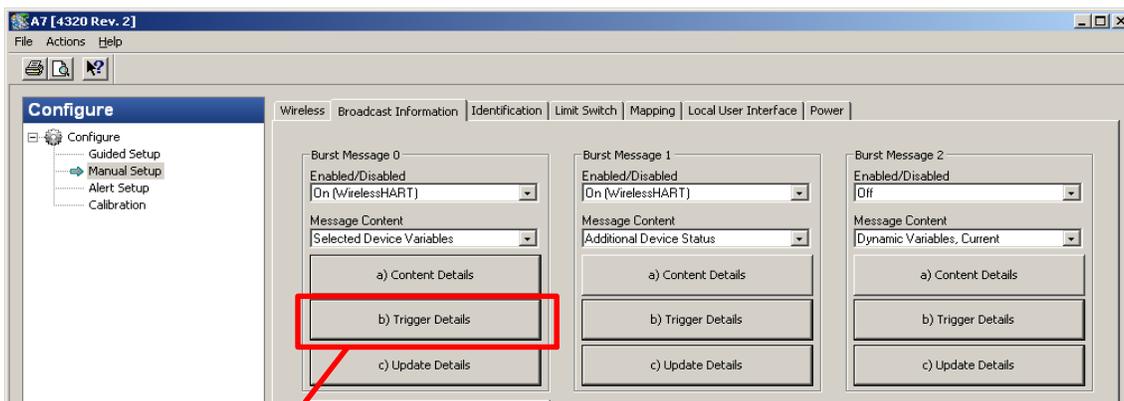


There are separate graphics for each language...

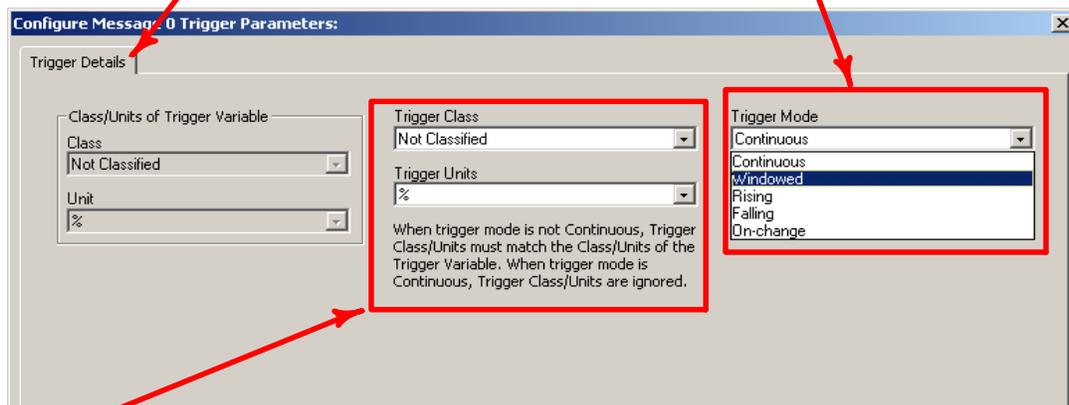
Burst Triggering Modes

The burst message can be published continuously at a constant rate, as above, or it can be configured for fast publishing when trigger conditions are met, with slower publishing as the default. This is often termed “Report by Exception”. Instead of “Continuous”, choose one of the 4 “triggered” modes: Windowed, Rising, Falling, or On-Change. Note that trigger class/units need to be set to the values of the trigger variable/class units for these modes.

In you open the Trigger Details menu:

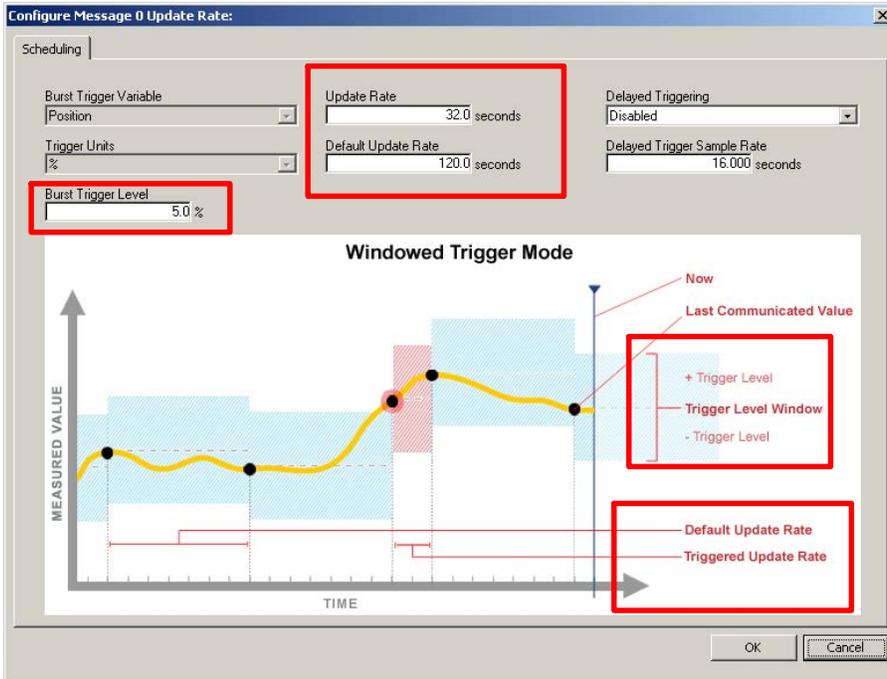


and select Windowed trigger mode



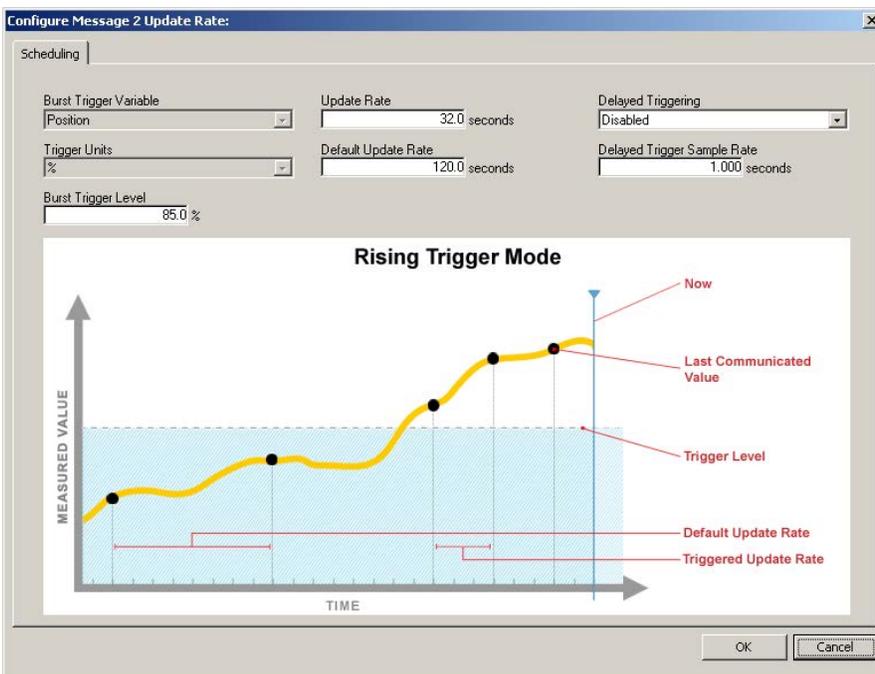
(Note that Trigger Class/Units need to be set to the values of the trigger variable/class units for these modes.)

The trigger level now defines a +/- zone around the previous published value.



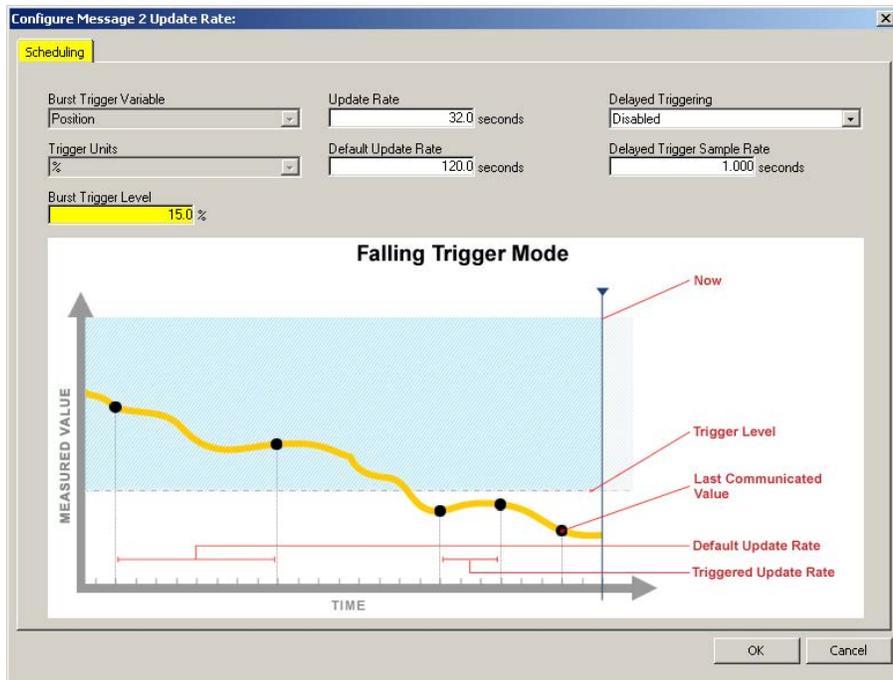
Set the “Update Rate” (referred to as “Triggered Update Rate” in the linked graphic) to the desired fast rate, and the “Default Update Rate” to the desired slow rate. Adjust the “Burst Trigger Level” to define the desired window around the current value that must be exceeded to trigger the faster rate.

In Rising trigger mode, the trigger level defines an upper threshold.



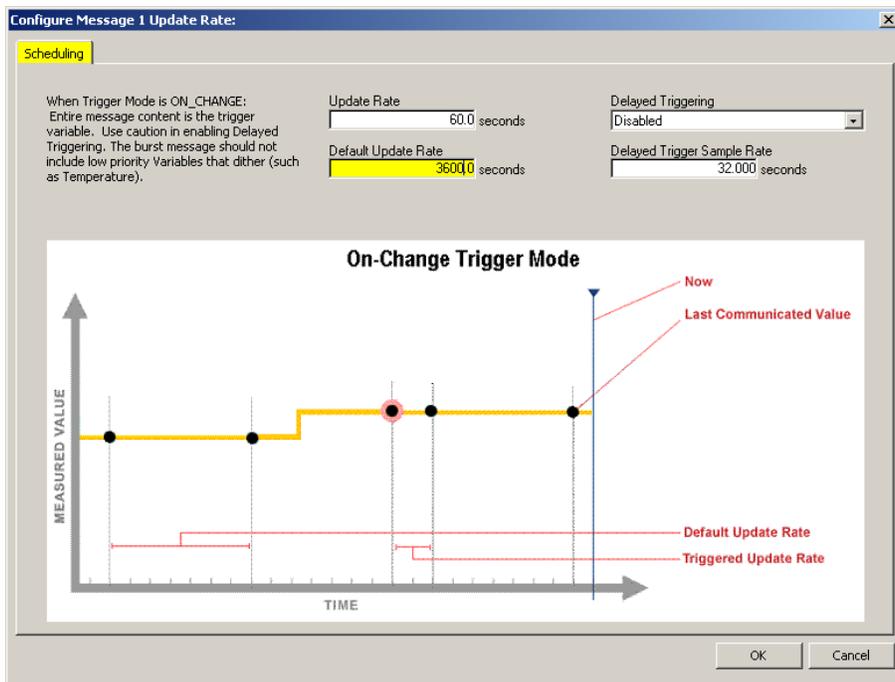
Adjust the “Burst Trigger Level” to define the desired upper threshold that must be exceeded to trigger the faster rate.

In Falling trigger mode, the trigger level defines a lower threshold.



Adjust the “Burst Trigger Level” to define the desired lower threshold that must be exceeded to trigger the faster rate.

In On-Change trigger mode, the entire message is the trigger source, and any deviation from the previous value triggers the fast rate. On-change mode is most useful for discrete-value message content.



Delayed Triggering

It is possible to miss transient events that occur between scheduled fast publishing updates. To alleviate this possibility, the 4310/4320 provides a unique feature called “Delayed Triggering”. A Delayed Trigger Sample Rate is set faster than the (Triggered) Update Rate; if a change occurs between the normal updates when Delayed Triggering is enabled the device captures the transient change and schedules publishing at the next available update time slot. This mode is called “Delayed” because the message is published a short time after the data was captured. However, it allows capture of a transient event that might have been missed by only checking for changes at the slower (Triggered) Update Rate.

When this feature is enabled, the device will monitor the trigger variable at the Delayed Triggering Sample Rate (faster than the active Update Rate). When trigger conditions are met, the message state will be latched and time-stamped. Publishing will occur at the next available slot. This allows capture of events that happen between scheduled publishing slots.

Configure Message 2 Update Rate:

Scheduling

Burst Trigger Variable: Position
 Update Rate: 32.0 seconds
 Trigger Units: %
 Default Update Rate: 120.0 seconds
 Burst Trigger Level: 15.0 %
 Delayed Triggering: Enabled
 Delayed Trigger Sample Rate: 16.000 seconds

Falling Trigger Mode

MEASURED VALUE vs TIME

Labels in graph: Now, Trigger Level, Last Communicated Value, Default Update Rate, Triggered Update Rate

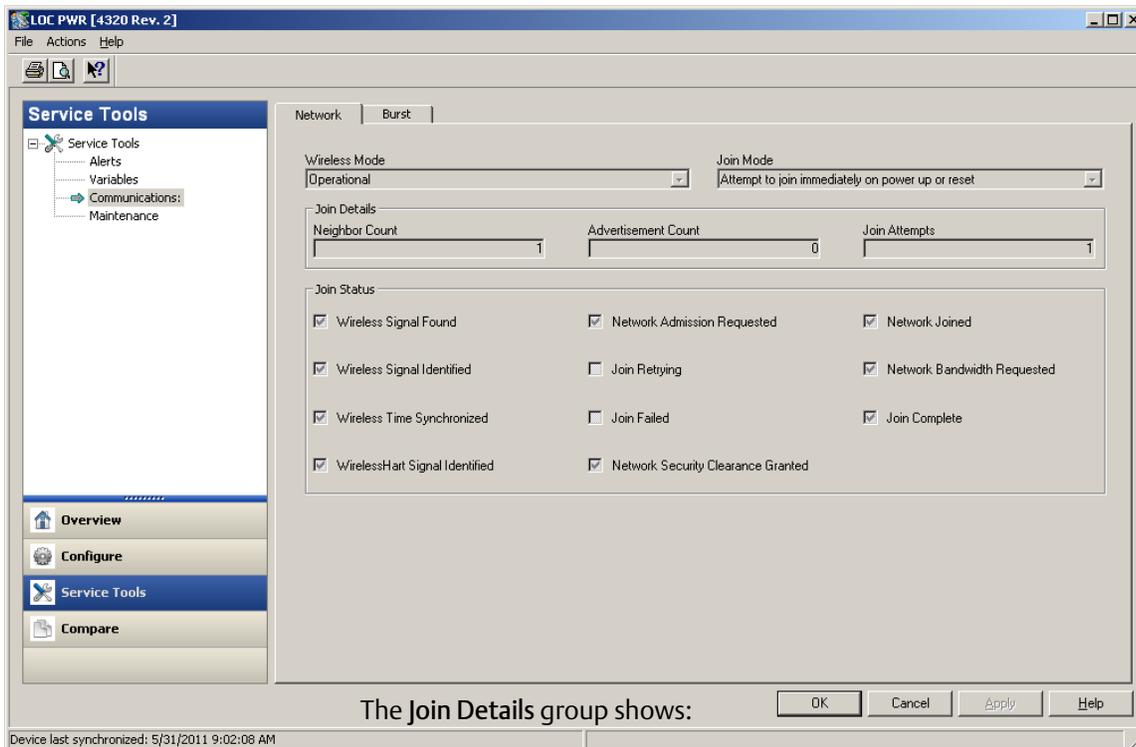
Buttons: OK, Cancel

Monitored variable will be sampled for trigger evaluation on this schedule. For battery-powered devices, this value must be between 0.5 sec and the Update Rate, in increments of 0.5 sec. In external-power devices, this value is read-only, and is as short as the processing schedule permits. Strictly speaking, this parameter is a period rather than a rate. (A rate would have units of updates per second.) Corporate interface standards require language that is less precise, producing this discrepancy.

(Exception: for External Power devices, the delayed trigger sample rate is fixed at the fastest rate possible in the device, since battery life is not a concern.)

Service Tools: Communication

The Communications diagnostics menu item in the Service Tools root menu has tabs for Network and Burst.



The Network tab show the current Wireless Mode:

Displays the state of the connection. The values are: Idle, Disconnected, Searching, Connected, and Operational.

The current Join Mode:

Instruction to the device with regard to joining the WirelessHART network.

The Join Details group shows:

Neighbor count:

Number of neighbors recognized by the instrument on the wireless network.

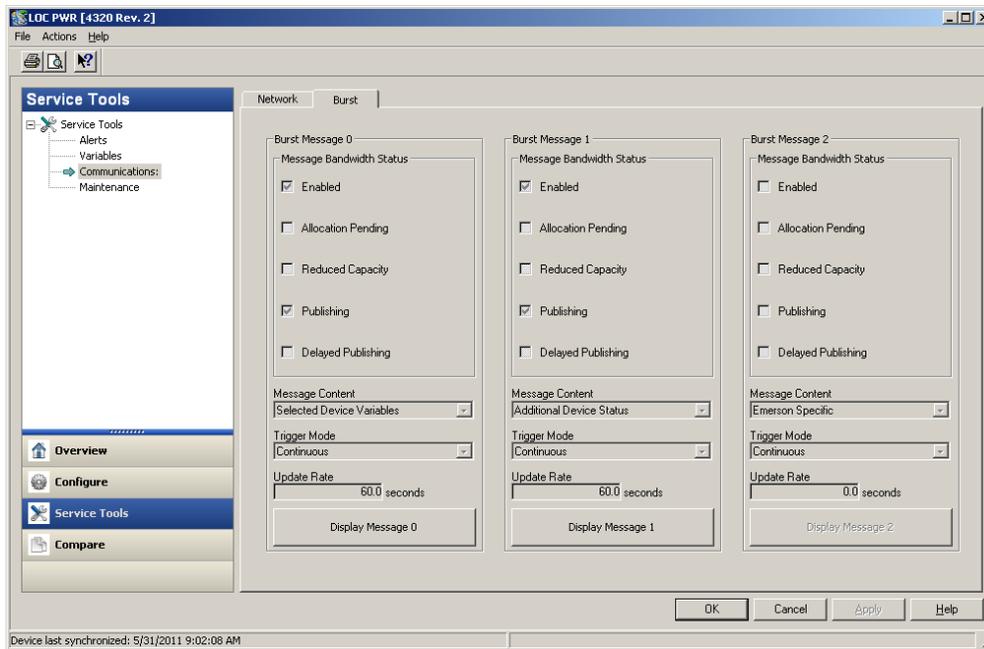
Advertisement count:

Number of Advertisement packets received.

Join Attempts:

Number of Join Attempts. Too many join attempts will result in the device considering the join failed.

The burst tab shows diagnostics for each burst message:



The message Bandwidth Status shows:

- whether a given message is enabled in the device
- whether it is still waiting for bandwidth allocation from the network for its requested update rate
- whether it has been assigned bandwidth but at a lower rate than requested
- whether it is actively publishing
- whether it is in Delayed Publishing mode (Using Delayed Trigger mechanism)

The configured Message Content, Trigger Mode, and active Update Rate are displayed next.

If the message is enabled, a button will allow you to view a snapshot of the values that would be published in the message, based on the current device states.

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