How To Use Simulated Rotation

When testing the Rotation-based features of the XXT G2 Firmware, it is useful to be able to simulate rotation while working with the Tool in the shop.

There are two parameters in the DIM (the MPTx20 Node) which can be used to simulate rotation, “rpmSmode” and “SimRPM” as described below. In order for you to be able to set these parameters, you’ll need to establish a User Capability Level (UCL) of 6 or higher. To do this, enter the following at the XL50 “Chat” prompt:

[20]<ucc=SysTech/6>/s? (confirm that a UCL=6 response is received)

1) rpmSmode (RPM Simulation Mode)
   This volatile parameter can be set to either “off” or “on”. The normal setting is “off”. If you set this parameter to “on”, then simulated rotation can be achieved at the rate specified by the “SimRPM” parameter. Because rpmSmode is a volatile parameter, it will return to its default value of “off” following any reset/startup of the tool.

2) SimRPM (Simulated RPM speed)
   This parameter is set to the desired simulated rotation speed in RPMs. Because SimRPM is a volatile parameter, it will return to its default value of zero (0) following any reset/startup of the tool.

PLEASE NOTE: The use of Simulated Rotation (rpmSmode/SimRPM) is made available ONLY for engineering test purposes and should NOT be used in the field. If tripped-in with Simulated Rotation ON, there are no fail-safe mechanisms to correct the issue.

Please also note that due to the high percentage of processor utilization when using simulated RPM mode the directional sensor sample rate (“DiSmpR”) is automatically and temporarily reduced to 64 frames per second. This eliminates possible errant and abnormal behavior due to the extreme high CPU usage required by the RPM simulation code.

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To configure the G2 Rotation-based features via the xxMWDconfig application in the xxMWD/PC™ Program Suite, “Enable G2” must be selected from the xxMWDconfig “Options” menu.

Click on the “Rotation” block to access the G2 Rotation-based parameters:

For Rotation to be detected, “RotThr” must be set to a non-zero value and the value for the simulated rate of rotation (SimRPM) must be higher than the value of “RotThr”.
Even if you’re not using the xxMWDconfig utility of the xxMWD/PC™ Program Suite to configure the Tool, you still need to be sure to set RotThr to a non-zero value when using rpmSmode and SimRPM to simulate rotation. All of these parameters can be set by using xxNETmonitor or a terminal emulation program such as Hyperterminal, Procomm or xxTerminal.

Note that RotThr is a non-volatile parameter. If you alter the value of RotThr for testing purposes, be sure to return it to its proper value prior to deployment of the Tool downhole.

The following command summary shows what you would expect to see on your terminal emulator screen when enabling simulated rotation at a rate of 20 RPM with a Rotation Threshold (RotThr) of 15 RPM:

XLM:Command\Chat>\[a****20XLMc14/?/x\]<ucc="********">/s?
[aXLMc14MPTx20/</x]UCL=6
XLM:Command\Chat>[a****20XLMc14/?/x]rpmSmode "on"?
[aXLMc14MPTx20/</x]rpmSmode="On"
XLM:Command\Chat>[a****20XLMc14/?/x]SimRPM 20?
[aXLMc14MPTx20/</x]SimRPM= 20.0
XLM:Command\Chat>[a****20XLMc14/?/x]RotThr 15?
[aXLMc14MPTx20/</x]RotThr=15.0

(Remember that RotThr is nonvolatile, so it must be restored to the proper value before deploying the Tool downhole).
Two other documents that will be of interest when working with the G2 Rotation-based features are:

“How To Configure Dynamic Sequences and Resynch”

“XXT-TechNote-xxMWD-G2-SUMMARY”

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Likewise, XXT LLC neither warrants nor supports the use of its xxMWDconfig/PC™ application to configure components that claim to be QDT-compatible or QDT-telemetry-compatible other than QDT V01.6x and, within certain limitations, QDT V02.0x-firmware-based telemetry components.

As always, XXT customers are encouraged to test all fieldable hardware and software configurations, including telemetry sequence definition strings, in the shop prior to using them in the field to ensure that they function exactly as required and anticipated.

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