
1250-LTC MODBUS Programming Interface

Purpose:

- To instruct technicians in installing and using the 1250-LTC MODBUS Programming Interface software.

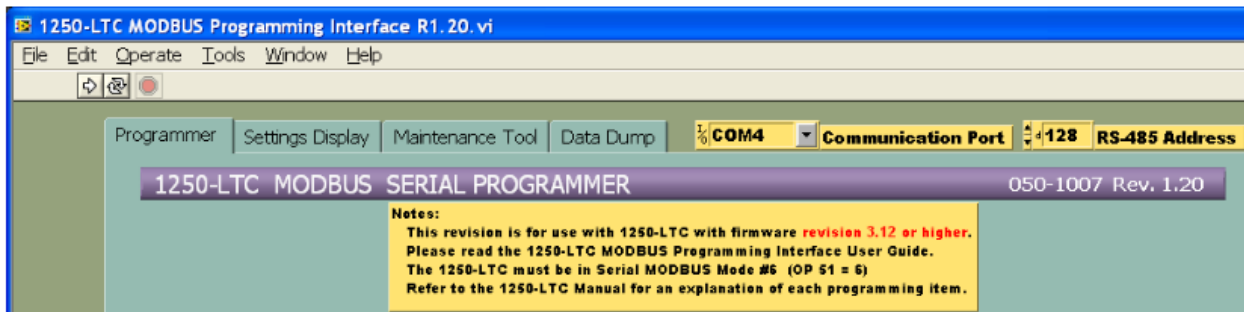
Associated Documents and Data:

- 000-2072 1250-LTC Installation and Programming Manual

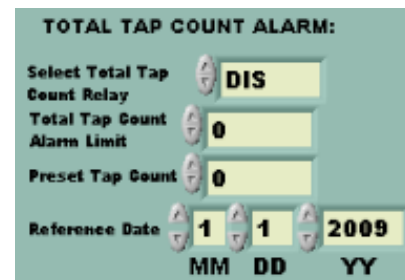
Procedure:

1. Place the CD into the CDROM drive.
2. The installation Wizard should automatically begin to install the program. Click the "Next" button.
3. Check the installation path. You may change it if desired by clicking the "Browse" button. Click on the "Next" button.
4. When asked if you are ready to install the application click the "Next" button. Answer the occasional prompts appropriately. The program will be installed. Click the "Finished" button when the installation is done.
5. **Prepare the 1250-LTC** to be programmed using MODBUS by entering the Program Mode:
 - A) Press the MENU until the display goes blank, then press the SELECT/ENTER button.
 - B) Scroll up to OP 51 by pressing the UP button then press the SELECT/ENTER button.
 - C) Press the UP button to change the value to "6" then press the SELECT/ENTER button.
 - D) Exit the Program Mode by scrolling to OP 0 then press the SELECT/ENTER button twice.
6. **Connect Serial Adaptor Cable** provided to the 1250-LTC's Auxiliary connector at the top-rear of the instrument. The red stripe of the cable must face the outside edge of the connector. Connect the Serial Adaptor Cable to DB-9 Male connector on the SC-485 Serial Converter. Connect the Serial Converter's DB-9 Female connector to the computer's serial port or (USB-232 Port Adaptor). (A 9-pin straight-through cable may be needed to make the connection.)
7. **To run the 1250-LTC MODBUS Programming Interface**, you may create a shortcut to the program, browse to the file "1250-LTC MODBUS Programming Interface Rn.nn.exe" with the Explorer, or select the program from the Start button under the "Programs" folder.

Programming:



1. There are four tabs across the top of the screen labeled “Programmer”; “Settings Display”; “Maintenance Tool”; “Data Dump”. To begin programming the 1250-LTC, select the “**Programmer**” tab.
2. Select the proper Communication Port from the choices in the pull down field. The address “128” is the 1250-LTC’s default. This must match the address setting in OP 80 (Port Settings).
3. Select the Lowest Tap Number of your LTC by clicking the up/down scroll buttons or type it directly into the field.
4. Select the Highest Tap Number of your LTC by clicking the up/down scroll buttons or type it directly into the field.
5. Select the number of neutral taps by clicking the up/down scroll buttons or type it directly into the field.
6. The maximum total number of taps is 40. If this number is exceeded, an alarm will appear on the computer and the program will abort.
7. If the lowest tap of your LTC is “1” and you have any neutral taps, you must enter the Neutral Start Tap number by clicking the up/down scroll buttons or type it directly into the field. If the lowest tap of your LTC is not “1”, you do not need to change this field. It will have no effect.
8. Select the proper Degrees Per Tap by clicking the up/down scroll buttons or type it directly into the field.
9. Select to Display R & L (On = red) or not (Off = gray).
10. If an alarm is desired for total tap counts, select which relay the alarm will close: “HIGH” or “LOW” (or “OFF” if a display of the active alarm is desired, but no relay closure). To disable the alarm completely, leave the setting “DIS”.
11. Set the Total Tap Count Alarm Limit. See the manufacturer’s specification. Enter a value.
12. If desired, Preset the Total Tap Counter. Enter a value.
13. If desired, type a reference date in the “MM” “DD” “YY” fields



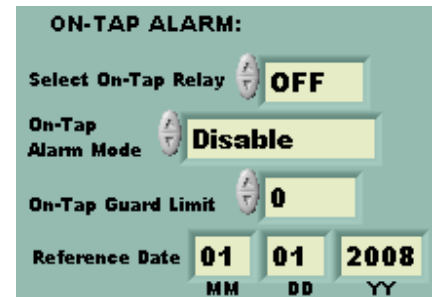
14. If an alarm is desired for loss of input signal (FA 25 Error), select which relay the alarm will close: "HIGH" or "LOW". If no relay closure is desired, leave the setting "OFF".
15. If you desire to have this alarm automatically reset when the input signal returns, change the FA 25 Alarm setting from "Latch-On" to "Auto-Reset".
16. If an alarm is desired for an unstable input signal (FA 27 Error), select which relay the alarm will close: "HIGH" or "LOW". If no relay closure is desired, leave the setting "OFF".
17. If you desire to have this alarm automatically reset when the input signal returns, change the FA 27 Alarm setting from "Latch-On" to "Auto-Reset".



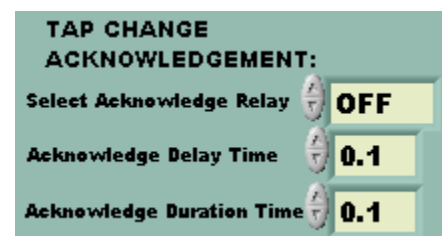
18. If desired, enable the 1250-LTC's Display Blanking (like a screen saver) by clicking on the button. It will turn red.



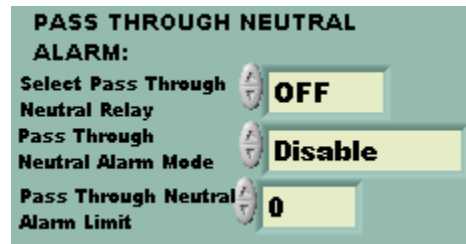
19. If an alarm is desired for excess On-Tap Deviation, change the Alarm Mode from "Disable" to either "Latch-On" or "Auto-Reset". In "Latch-On" mode, the alarm will remain active even after the provoking condition clears. In "Auto-Reset" mode, the alarm will turn off when the provoking condition clears.
20. If a relay contact closure is desired when the alarm is active, change the Relay setting from "OFF" to "HIGH" or "LOW", to select which relay will close when the alarm is active. If the Relay setting is left "OFF", the display will indicate when the alarm is active, but no relay will close.
21. Set the On-Tap Guard Limit (in degrees with 1/10th degree resolution) by clicking the up/down scroll buttons or type it directly into the field.
22. If desired, type a reference date in the "MM" "DD" "YY" fields.



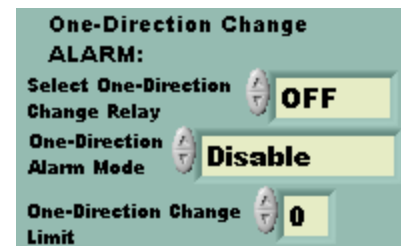
23. If a relay acknowledgement is desired for each tap change, select which relay will close: "HIGH" or "LOW". If no acknowledgement is desired, leave the setting "OFF".
24. If a time delay is desired before the acknowledgement relay closes, set the Delay Time (in seconds with 1/10th second resolution) by clicking the up/down scroll buttons or type it directly into the field.
25. If a time delay is desired after the acknowledgement relay closes, set the Duration Time (in seconds with 1/10th second resolution) by clicking the up/down scroll buttons or type it directly into the field.



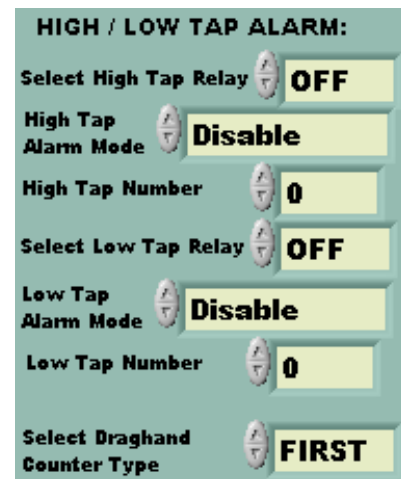
26. If an alarm is desired for the time since the LTC has passed through neutral, change the Alarm Mode from “Disable” to either “Latch-On” or “Auto Reset”. In “Latch-On” mode, the alarm will remain active even after the provoking condition clears. In “Auto-Reset” mode, the alarm will turn off when the provoking condition clears.
27. If a relay contact closure is desired when the alarm is active, change the Relay setting from “OFF” to “HIGH” or “LOW”, to select which relay will close when the alarm is active. If the Relay setting is left “OFF”, the display will indicate when the alarm is active, but no relay will close.
28. Set the Pass Through Neutral Alarm Limit (in days with 1/10th day resolution) by clicking the up/down scroll buttons or type it directly into the field.



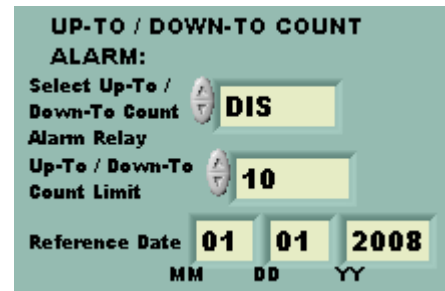
29. If an alarm is desired for the number of consecutive tap changes in one direction, change the Alarm Mode from “Disable” to either “Latch-On” or “Auto Reset”. In “Latch-On” mode, the alarm will remain active even after the provoking condition clears. In “Auto-Reset” mode, the alarm will turn off when the provoking condition clears.
30. If a relay contact closure is desired when the alarm is active, change the Relay setting from “OFF” to “HIGH” or “LOW”, to select which relay will close when the alarm is active. If the Relay setting is left “OFF”, the display will indicate when the alarm is active, but no relay will close.
31. Set the One-Direction Change Limit (in taps) by clicking the up/down scroll buttons or type it directly into the field.



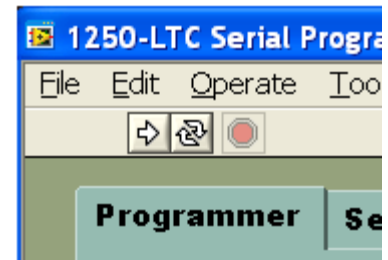
32. If an alarm is desired for a High Tap position or a Low Tap position, select which relay will close: change the appropriate Alarm Mode from “Disable” to either “Latch-On” or “Auto Reset”. In “Latch-On” mode, the alarm will remain active even after the provoking condition clears. In “Auto-Reset” mode, the alarm will turn off when the provoking condition clears.
33. If a relay contact closure is desired when the alarm is active, change the appropriate Relay setting from “OFF” to “HIGH” or “LOW”, to select which relay will close when the alarm is active. If the Relay setting is left “OFF”, the display will indicate when the alarm is active, but no relay will close.
34. Set the High Tap Limit and Low Tap Limit by clicking the up/down scroll buttons or type them directly into the fields.
35. Select the Draghand Counter Type – FIRST or LAST. This will determine whether the counter will record the number of days since the earliest (FIRST) visit to the highest and lowest taps or the most recent (LAST) visit to those taps.



36. If an alarm is desired for the number of tap changes Up-To and Down-To each tap, select which relay the alarm will close: "HIGH" or "LOW" (or "OFF" if a display of the active alarm is desired, but no relay closure). To disable the alarm completely, leave the setting "DIS".
37. Set the Up-To / Down-To Count Limit by clicking the up/down scroll buttons or type it directly into the field.
38. If desired, type a reference date in the "MM" "DD" "YY" fields.

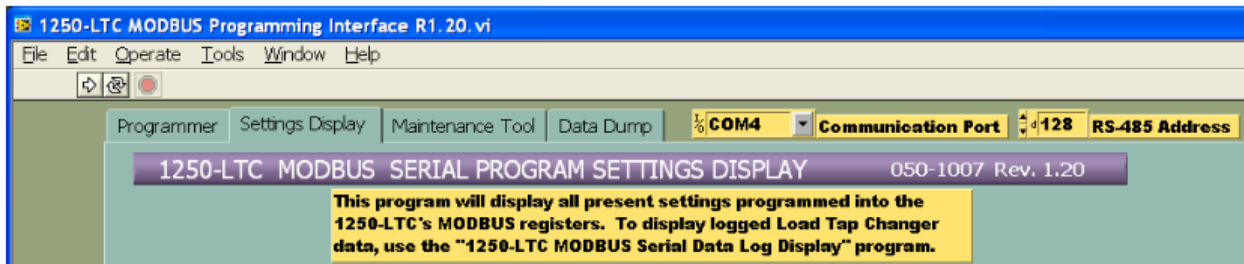


39. When all settings are entered, click the large white (Run) arrow in the upper left of the window. Do not click on the circular arrows (Continuous Run). The display on the 1250-LTC should read "SetUP" and the progress bar should change from black to green while the program settings are downloaded into the 1250-LTC's memory.
40. When the programming is done, the 1250-LTC's display will return to the Run Mode,

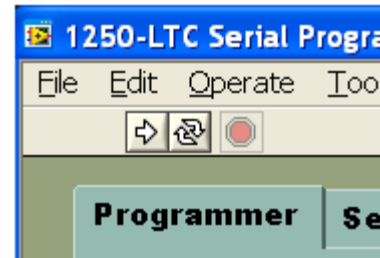


41. It will be necessary to load the present tap position using the Keyboard (buttons) Programming Menu. Enter the Programming Menu, scroll to OP 27 and enter. Scroll to the present tap position value and enter. Scroll up to OP 28 and enter. The display should read "Ld". Press the ENTER button once more. The display will go blank for a few seconds and return to OP 28. Scroll to OP 0 and press the ENTER button TWICE to enter the RUN mode. The Acknowledgement Relay may close and open several times (if enabled) as it counts off the number of taps between the previous position and the present position.
42. There may be active alarms showing on the display as a result of new program settings or remaining from the pre-programmed state. Use the "**Maintenance Tool**" tab (see below) to clear active alarms and reset erroneous LTC data causing alarms.

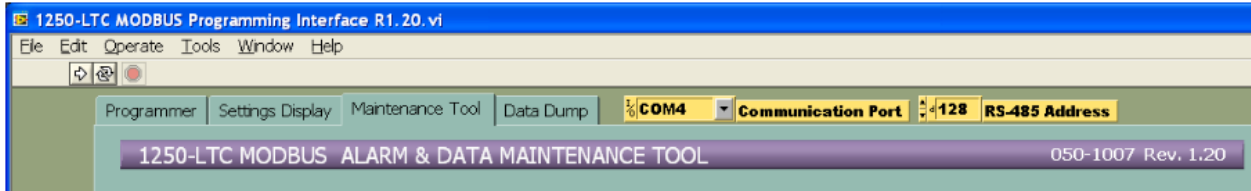
Settings Display:



1. To display all program settings in the 1250-LTC's memory, select the "**Display Settings**" tab.
2. Click on the large white (Run) arrow in the upper left of the window. Do not click on the circular arrows (Continuous Run).
3. As the computer receives each program setting from the 1250-LTC, the information will be displayed in the appropriate fields on the screen, and the progress bar should change from black to green. (Note: If the progress bar stops for more than 30 seconds, restart the program by clicking the large white (Run) arrow again.)

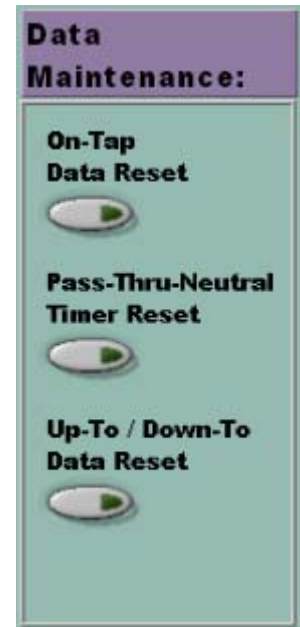


Maintenance Tool:

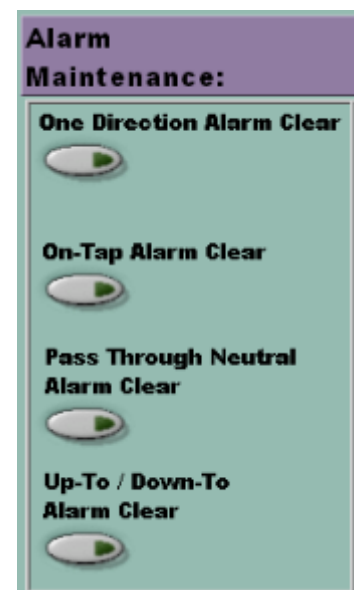


1. To clear alarms or reset logged data, select the **"Maintenance Tool"** tab.
2. Alarm or Data maintenance can be done one item at a time or all at once.
3. No action will be taken until the white (Run) arrow in the upper left of the window is clicked to run the program.

4. **On-Tap Data Reset** If this button is clicked, all logged On-Tap data will be reset to zero degrees when the program is run.
5. **Pass-Thru-Neutral Timer Reset** If this button is clicked, the Pass-Thru-Neutral Timer will be reset to zero days when the program is run.
6. **Up-To / Down-To Data Reset** If this button is clicked, all logged Up-To / Down-To counters will be reset to zero when the program is run.



7. **One Direction Alarm Clear** If this button is clicked, an active One Direction Alarm will be cleared when the program is run. (Note: If the next LTC tap change is in the SAME direction as the last tap change, the alarm will re-activate.)
8. **On-Tap Alarm Clear** If this button is clicked, an active On-Tap Alarm will be cleared when the program is run. (Note: The On-Tap Alarm will re-activate the next time the LTC position stops beyond the On-Tap Limit.)
9. **Pass Through Neutral Alarm Clear** If this button is clicked, an active Pass Through Neutral alarm will be cleared when the program is run. (Note: The Pass Through Neutral alarm will immediately re-activate if the Pass Through Neutral timer, step #6, is not also reset.)
10. **Up-To / Down-To Alarm Clear** If this button is clicked, an active Up-To / Down Alarm will be cleared when the program is run. (Note: The On-Tap Alarm will re-activate the next time the LTC moves to a tap with an Up-To or Down-To count that is equal to or higher than the alarm limit.)



11. **Low Tap Alarm Clear** If this button is clicked, an active Low Tap Alarm will be cleared when the program is run. (Note: The Low Tap Alarm will re-activate the next time the LTC moves to a tap that is equal to or lower than the Low Tap Limit.)
12. **High Tap Alarm Clear** If this button is clicked, an active High Tap Alarm will be cleared when the program is run. (Note: The High Tap Alarm will re-activate the next time the LTC moves to a tap that is equal to or higher than the High Tap Limit.)
13. **"FA 25" Alarm Clear** If this button is clicked, an active "FA 25" Alarm (loss of Synchro signal) will be cleared when the program is run. (Note: The "FA 25" Alarm will re-activate the next time the Synchro signal is lost.)
14. **"FA 27" Alarm Clear** If this button is clicked, an active "FA 27" Alarm (Synchro signal is unstable) will be cleared when the program is run. (Note: The "FA 27" Alarm will re-activate the next time the Synchro signal is unstable.)
15. **Total Tap Count Alarm Clear** If this button is clicked, an active Total Tap Count alarm will be cleared when the program is run. (Note: The Total Tap Count alarm will re-activate on the very next tap change unless the Total Tap Counter Alarm Limit is raised, step #17, or the Total Tap Count is preset to a value lower than the Total Tap Counter Limit. Presetting the Tap Count must be done from the "Programmer" tab.)

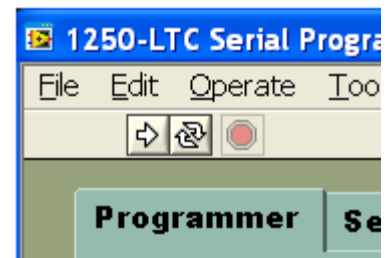


16. **Change Total Tap Counter Alarm Limit** If a Total Tap Change alarm needs to be cleared, the Total Tap Counter Alarm Limit will need to be raised, or the alarm will re-activate on the very next tap change. The decision to change this alarm limit should not be taken lightly. You may be running the LTC beyond its recommended life. To change Alarm Limit, click the button shown above.



17. Enter a new Counter Alarm Limit by clicking the up/down scroll buttons or type it directly into the field. The 1250-LTC will be programmed with the new Alarm Limit when the program is run.

18. Once the desired maintenance actions have been chosen, run the program. Click on the large white (Run) arrow in the upper left of the window. Do not click on the circular arrows (Continuous Run). The 1250-LTC will display "SEtuP" momentarily while maintenance commands are sent, then return to the normal run mode.



19. **Net Tap Changes** This software can display (and optionally log) the “Net Tap Changes” from the last time the software was run. A date “Since” can be entered for future reference. This date will be stored in the log file that is initially created and subsequently re-used on the computer.

20. Initial setup: Before these functions can be used, this program must be run with both buttons clicked on. One will turn red, the other will turn blue. A valid reference date must also be entered. This will establish a point of reference for future calculations. Click on the large white (Run) arrow in the upper left of the window. The program will prompt you to name a new log file or

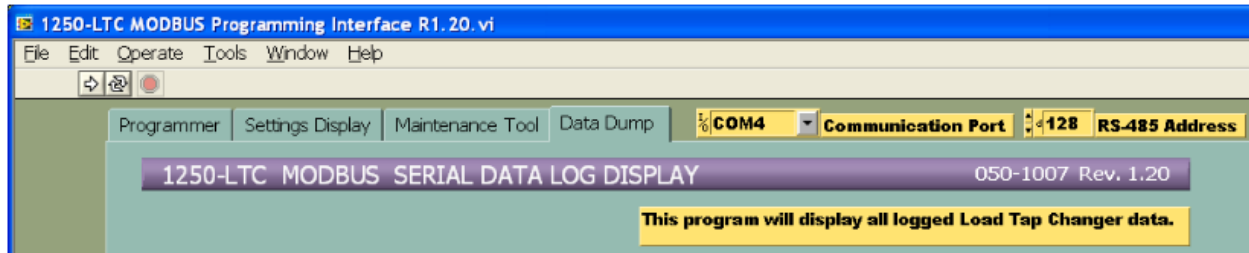
browse to an existing log file in the C:\Temp folder. [A unique log file must be created and re-used for each specific 1250-LTC.](#)

21. After the initial setup: As often as desired, the Net & Total Tap Changes and their dates “Since” can be displayed. To do this, click the upper button, it will turn red. Next, click on the large white (Run) arrow in the upper left of the window to run the program. Browse to the **correct log file for the specific 1250-LTC** being polled.

22. Periodically, the Net Tap Change Counter can be zeroed. To do this, click the lower button, it will turn blue. A new Reference Date should be entered each time the counter is zeroed. Next, click on the large white (Run) arrow in the upper left of the window to run the program. Browse to the **correct log file for the specific 1250-LTC** being polled.

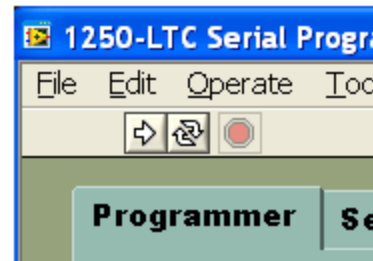
23. The log file is updated each time the Counter is zeroed. This text file can be used to create a spreadsheet or printed.

Data Dump:



1. To display all LTC data logged in the 1250-LTC’s memory, select the “Data Dump” tab.

2. To display the logged data, click on the large white (Run) arrow in the upper left of the window. Do not click on the circular arrows (Continuous Run). As the computer receives each piece of data from the 1250-LTC, the information will be displayed in the appropriate fields on the screen, and the progress bar should change from black to green. (Note: If the progress bar stops for more than 30 seconds, restart the program by clicking the large white (Run) arrow again.)



3. The present LTC status is indicated in the first section, including the Present LTC Position, Total Tap Changes since the reference date, the Low Draghand Position, and the High Draghand Position, as shown below.

Setting:	Description:
4	Present Tap–Neutral 103.9 Degrees Raw Synchro Pos.
32719	Total Tap Changes Since 3 7 2008
-14	Low Draghand Tap–Neutral 80.9 Days Since Last Visit
15	High Draghand Tap–Neutral 43.5 Days Since Last Visit

4. Active alarm information will be displayed, inactive alarms will be covered as shown below:

Active Alarms:			
	Since Activated	Days:	Limit:
On-Tap Deviation	71.4	3.0	Deg. 3 7 2008
Synchro Instability	0		
Synchro Signal Lost	0		
1 Direction Change	0.9	8	
Up / Down Count	33.7	10000	3 7 2008
Total Tap Changes	0	300000	3 7 2008
Low Tap	80.9	-10	
High Tap	43.5	10	
Pass-Thru-Neutral	0	30.0	23 Days Since Last Pass-Thru-Neutral

Active Alarms:			
	Since Activated	Days:	Limit:
On-Tap Deviation	71.4	3.0	Deg. 3 7 2008
Synchro Instability	0		
Synchro Signal Lost	0		
1 Direction Change	0.9	8	
Up / Down Count	33.7	10000	3 7 2008
Low Tap	80.9	-10	
High Tap	43.5	10	
Pass-Thru-Neutral	0	30.0	23 Days Since Last Pass-Thru-Neutral

5. Logged LTC movement data will be shown for each tap in the table at the right of the screen. Each active Tap Number is listed - including each neutral tap, with its maximum On-Tap Deviation, the number of changes Up-To and Down-To that tap, as shown:

Tap #	Neut #	Max Dev.	Up To	Down To
-16		0	0	0
-15		0	0	0
-14		-0.1	0	7
-13		-0.2	7	12
-12		-0.1	12	27
-11		-0.3	27	85
-10		3.9	85	157
-9		0.1	157	272
-8		0.3	272	561
-7		0.2	561	724
-6		-1.1	724	1317
-5		-2.9	1317	2971
-4		-2.1	2971	6142
-3		4.9	6142	10579
-2		-5	10579	5060
-1		-3.1	5060	9152
0	-1	-5.1	9152	8611
1		4.6	8611	6079
2		3.3	6079	4817
3		-3.1	4817	3176

