

5.1 Energy Integrator INTG

- ELF 3234 and ELF 3234-3 are equipped with Energy Integrator function which provides several energy parameters for Energy Management: VAh, Wh, VARh, -VARh.
- The Integrator parameters are always accumulated irrespective of the display parameter selected.
- All the recorded values are direct readings and have a high resolution. This enables accurate energy analysis over short intervals of time.
- The Integrator parameters can be viewed by changing the PAR in the PROG menu (setup).

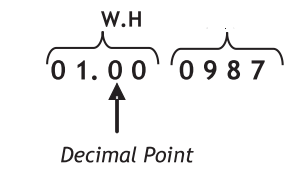
E.g.: ELF 3234 is in operation in the “Wh” mode. Not only Wh, but also the other Integrator parameters (VAh, VARh) will also get accumulated. If you want to view the VAh accumulated, enter PROG menu and change “PAR” from W to VA.

5.2 Labeling of INTG parameters

Integrator values up to 4 digits both before and after decimal place are displayed. The labelling of Integrator parameters for display is as explained below.

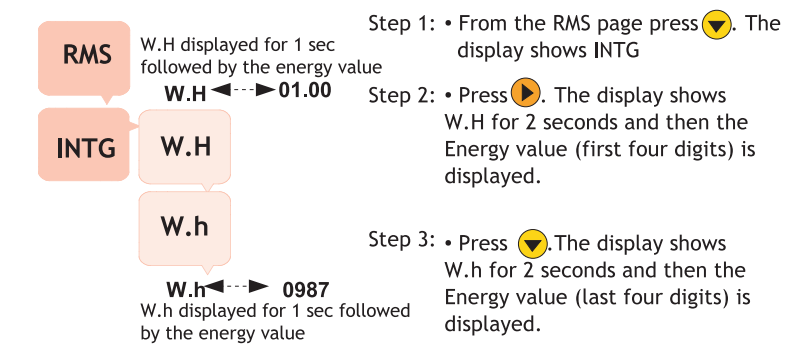
Here is an example to explain the labelling on Integrator parameters. If the display of ELF 3200 reads
W.H = 01.00
W.h = 0987
Then the Energy value = 1.000987 Wh.

In ELF 3200 series meters display, the first four digits are labelled with “W.H.” (both capital) and the last four digits are labelled with “W.h.”.



5.3 Viewing INTG parameters

The example below tells you how to view the Integrator parameters using your ELF 3200 series meter (ELF 3234 and ELF 3234-3). Energy value = 1.000987 Wh. Follow steps 1,2,3.



5.4 OLD data register

- When the Integrator is cleared (manually or due to overflow), the energy values stored in the integrator will be transferred to OLD register.
- Thus the old energy values are not lost even after the integrator is cleared and can be viewed with the OLD parameter.
- Available with 3234 and 3234 3 models

NOTE: For energy studies clear the Integrator at the end of each observation. This will, transfer all the stored energy values to the OLD register and held frozen, while the Integrator begins accumulating data for the next observation. Remember that the next time the Integrator is cleared, the OLD values will be over-written.

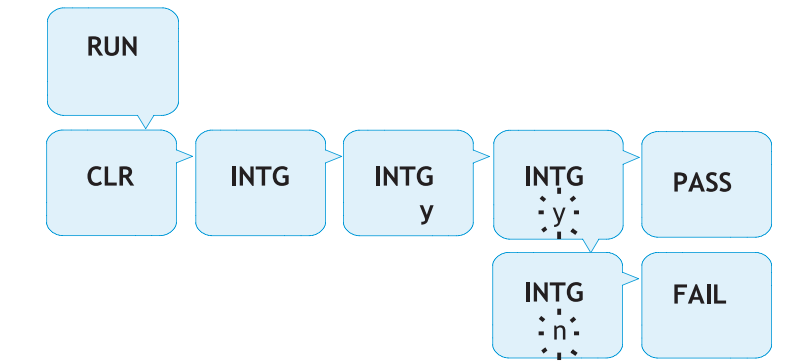
5.5 INTG Overflow

- The energy values stored in INTG will max out based on the PT ratio x CT ratio set for the application.
- Enable easy energy management calculations - all the INTG (VAH/VAh, WH/Wh, VARH/VARh, -VARH/-VARh) reset together whenever any one of them (usually VAH/VAh) overflows.
- The maximum number that the Meter handles is 9,999 Giga for RMS and Energy values.
- The values stored in INTG are transferred into OLD register during INTG overflow. Refer section 5.4 for details.

The INTG Overflow values are shown below			
PT ratio x CT ratio	Max reading (Wh/VAh)	Time taken for Overflow (months)	
		Min	Max
1 to 1.999	9999K	1.92	3.85
2 to 1000.999	9999M	3.85	1928.81
Greater than 1001	9999G	3.85	3857.63

5.6 Clear INTG

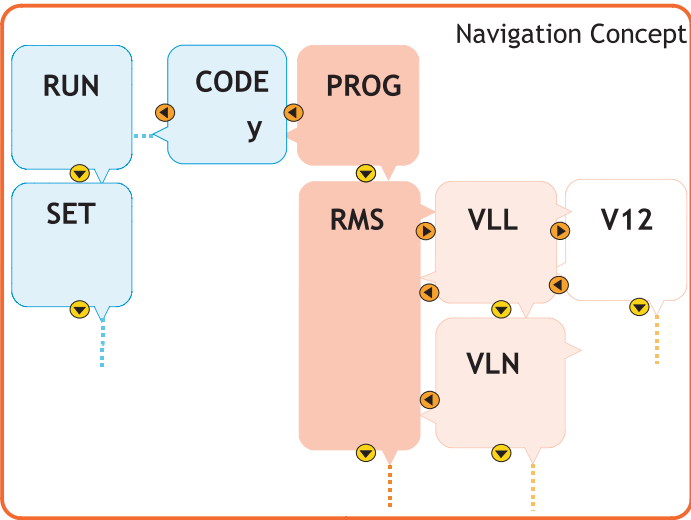
ELF 3234 and ELF 3234-3 are equipped with Energy Integrator INTG, where the energy parameters are accumulated. Refer Section 5.1 for information on INTG



- Step 1: • Enter the PROG Menu. Refer Section 3.3
- Step 2: • When the display shows “RUN”, go to the right arrow key. The display shows “CLR”.
- Step 3: • Go to the right arrow key. You have entered the CLR menu and the display shows “INTG”
- Step 4: • Go to the right arrow key to proceed with INTG clear. The display shows “INTG Y” with blinking “Y”.
- This is to prompt you that you are about to Clear the data stored in INTG.
 - If you do not want to clear INTG, go to the left arrow key. The display shows “INTG N”.
- Go to the right arrow key.
- The display shows “FAIL” which indicates failure in clearing INTG. Now go to step 6
- Step 5: • Go to the right arrow key once to clear INTG. “PASS” flashes on the display followed by INTG.
- INTG is cleared and the data is transferred to OLD register. Refer Section 5.4
 - If the right arrow key is pressed more than once, the Integrator value will not be transferred to OLD register and will be lost.
- Step 6: • Press the left arrow key to exit.
- Now, you’re back in the PROG Menu and can go to the right arrow key to “RUN”
 - Now go to the right arrow key to “RMS”

6.1 Keypad Operation

Take a quick look at what the keys do



Let us take an example to understand the actions of the front panel keys in the RUN menu. This example will explain how you can navigate from the ‘RMS’ page to the ‘VLN’ page and back to ‘RMS’ in ELF 3259

- Step 1: • From the RMS page use the RIGHT key. The display shows ‘VLL’ .
- The RIGHT key can be used to go forward into sub-parameter pages .
- Step 2: • Now press the DOWN key
- You can Scroll down through other display pages at the same level using the DOWN key. The display shows ‘VLN’. Congrats you have successfully navigated from ‘RMS’ to ‘VLN’
- Step 3: • To return to ‘RMS’ press the LEFT key. The display shows ‘RMS’
- Using the left key you can go back towards to the main parameter pages from the sub-parameter pages
 - Going Left past “PROG” requires Code entry to enter PROG menu (Setup and Clear)

6.2 Auto Scroll

- Auto display of a group of Display Pages sequentially every 5 seconds, without constantly pressing the keys.
 - Parameter Name (1 sec) followed by the value (4 sec) is displayed.
- Enter Auto Scroll**
- Go to the desired display page
 - Press for 3 seconds (minimum) and then release key.
 - The display flashes “AUTO” and then automatically scrolls through other pages at the same level.
 - Press any key to revert to Manual Scrolling.

6.3 Indicators - Kilo, Mega, Giga and Negative

Kilo

When lit, indicates that the reading is in Kilo (10³). 10,000 is displayed as 10.00K and 1.0K as 1000

E.g.: 32.00 with K LED glowing indicates the value reads 32,000

Mega

When lit, indicates that the reading is in Mega, (10⁶). 10,000K is shown as 10.00M and 1.0M as 1000K

E.g.: 32.00 with M LED glowing indicates the value reads 32,000K

Giga

When **Kilo** and **Mega** are both glowing, the reading is in **Giga** (10⁹). 10,000 M is shown as 10.00G. 1.0G is shown as 1000M.

E.g.: 32.00 with both K and M LED's glowing reads as 32,000M

Negative -

When lit, indicates that the reading is **negative** Per IEEE 100 and industry standard practice by meter-men:

- With Forward Flow of Watts & Capacitive (Leading) load: VAR & PF are negative.
- With Reverse Flow of Watts & Inductive (Lagging) load: VAR, PF and Watts are negative

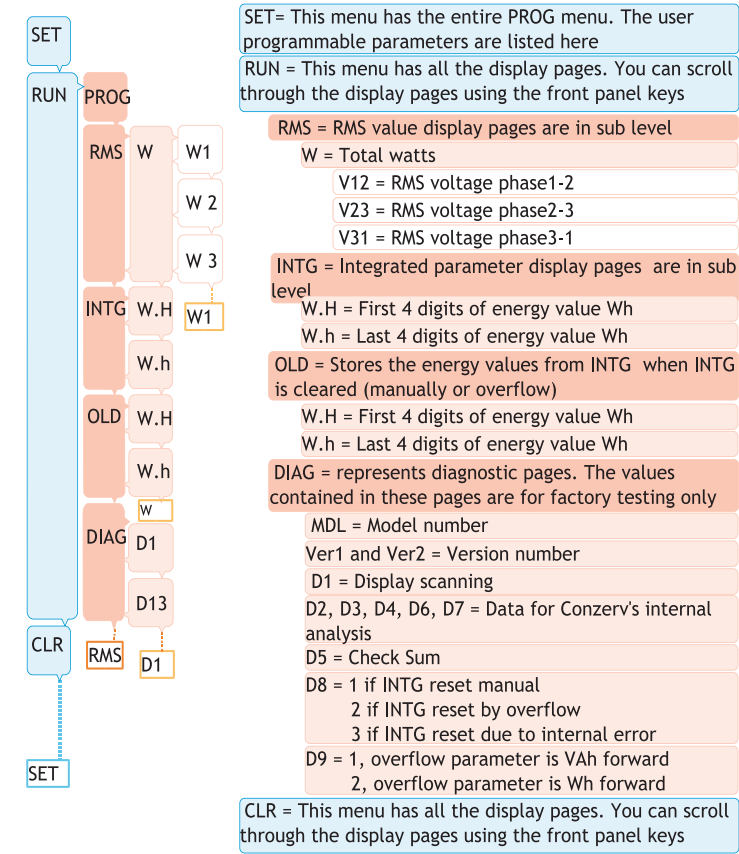
E.g.: 32.00 with negative LED glowing indicates the value reads as -32.00.

6.4 Models

		v02.05.01								
Parameter		ELF 3259	ELF 3234				ELF 3234-3			
			W	VA	VAR	PF	W	VA	VAR	
RMS	V	●								
	A	●								
	% Load	●								
	% Unbal	●								
	F	●								
RMS	RPM	●								
	W		●				●			
	VA			●				●		
	VAR				●				●	
	PF					●	●	●	●	
INTG	Wh		●							
	VAh			●						
	VARh				●				●	
	-VARh				●				●	
	Wh		●				●			
OLD	VAh			●				●		
	VARh				●				●	
	-VARh				●				●	
	Wh		●					●		
	VAh			●					●	

Display parameter factory-set to W for ELF 3234 Wh for ELF 3234-3 Display parameter selection can be edited through PROG Menu. Refer section 3.2, 4.2

7.1 Display Map - ELF 3234



SET= This menu has the entire PROG menu. The user programmable parameters are listed here

RUN = This menu has all the display pages. You can scroll through the display pages using the front panel keys

RMS = RMS value display pages are in sub level

- W = Total watts
- V12 = RMS voltage phase1-2
- V23 = RMS voltage phase2-3
- V31 = RMS voltage phase3-1

INTG = Integrated parameter display pages are in sub level

- W.H = First 4 digits of energy value Wh
- W.h = Last 4 digits of energy value Wh

OLD = Stores the energy values from INTG when INTG is cleared (manually or overflow)

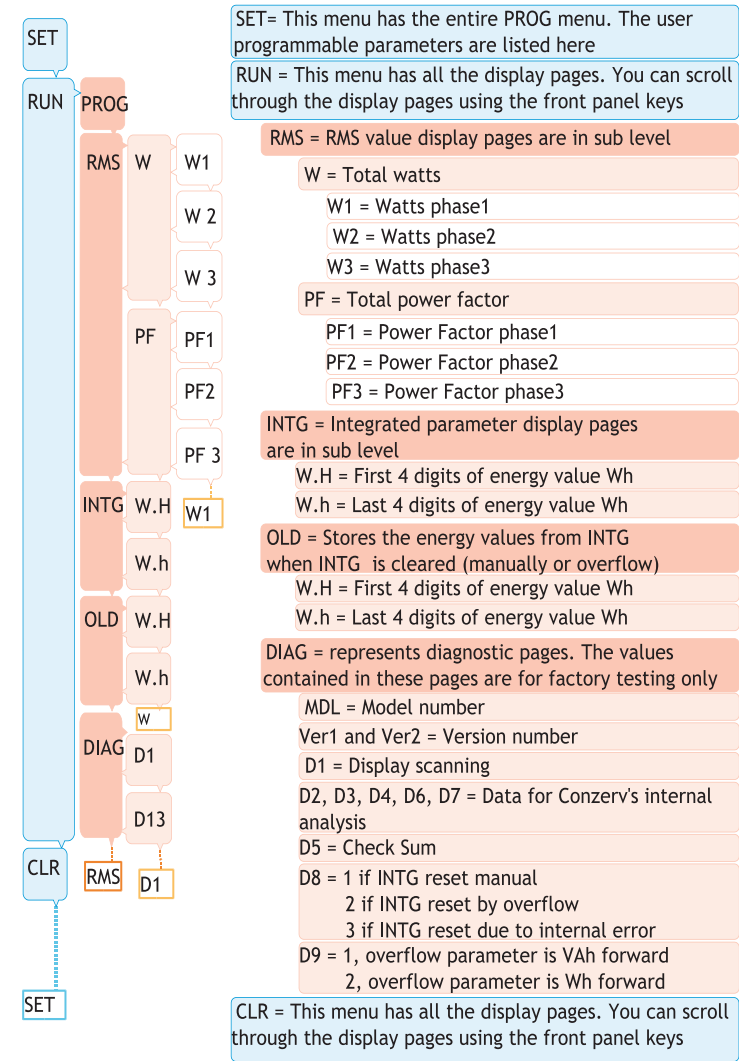
- W.H = First 4 digits of energy value Wh
- W.h = Last 4 digits of energy value Wh

DIAG = represents diagnostic pages. The values contained in these pages are for factory testing only

- MDL = Model number
- Ver1 and Ver2 = Version number
- D1 = Display scanning
- D2, D3, D4, D6, D7 = Data for Conserv's internal analysis
- D5 = Check Sum
- D8 = 1 if INTG reset manual
- 2 if INTG reset by overflow
- 3 if INTG reset due to internal error
- D9 = 1, overflow parameter is VAh forward
- 2, overflow parameter is Wh forward

CLR = This menu has all the display pages. You can scroll through the display pages using the front panel keys

7.2 Display Map - ELF 3234-3



SET= This menu has the entire PROG menu. The user programmable parameters are listed here

RUN = This menu has all the display pages. You can scroll through the display pages using the front panel keys

RMS = RMS value display pages are in sub level

- W = Total watts
- W1 = Watts phase1
- W2 = Watts phase2
- W3 = Watts phase3
- PF = Total power factor
- PF1 = Power Factor phase1
- PF2 = Power Factor phase2
- PF3 = Power Factor phase3

INTG = Integrated parameter display pages are in sub level

- W.H = First 4 digits of energy value Wh
- W.h = Last 4 digits of energy value Wh

OLD = Stores the energy values from INTG when INTG is cleared (manually or overflow)

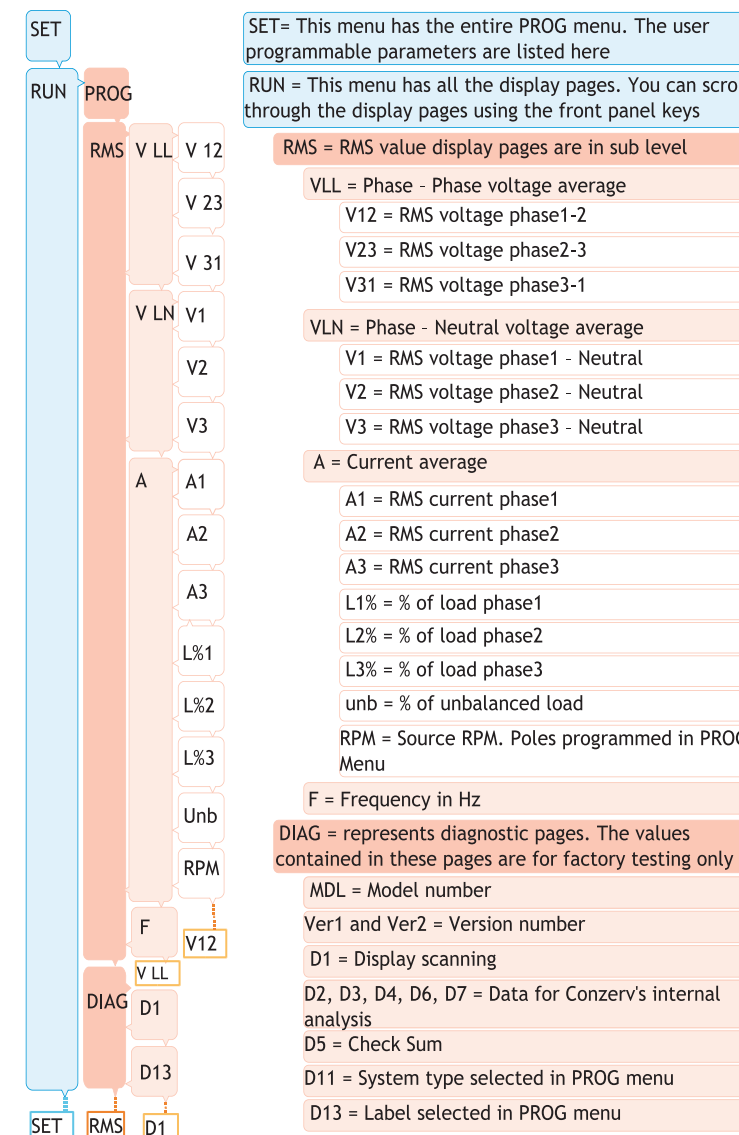
- W.H = First 4 digits of energy value Wh
- W.h = Last 4 digits of energy value Wh

DIAG = represents diagnostic pages. The values contained in these pages are for factory testing only

- MDL = Model number
- Ver1 and Ver2 = Version number
- D1 = Display scanning
- D2, D3, D4, D6, D7 = Data for Conserv's internal analysis
- D5 = Check Sum
- D8 = 1 if INTG reset manual
- 2 if INTG reset by overflow
- 3 if INTG reset due to internal error
- D9 = 1, overflow parameter is VAh forward
- 2, overflow parameter is Wh forward

CLR = This menu has all the display pages. You can scroll through the display pages using the front panel keys

7.3 Display Map - ELF 3259



SET= This menu has the entire PROG menu. The user programmable parameters are listed here

RUN = This menu has all the display pages. You can scroll through the display pages using the front panel keys

RMS = RMS value display pages are in sub level

- VLL = Phase - Phase voltage average
- V12 = RMS voltage phase1-2
- V23 = RMS voltage phase2-3
- V31 = RMS voltage phase3-1

VLN = Phase - Neutral voltage average

- V1 = RMS voltage phase1 - Neutral
- V2 = RMS voltage phase2 - Neutral
- V3 = RMS voltage phase3 - Neutral

A = Current average

- A1 = RMS current phase1
- A2 = RMS current phase2
- A3 = RMS current phase3
- L1% = % of load phase1
- L2% = % of load phase2
- L3% = % of load phase3
- unb = % of unbalanced load
- RPM = Source RPM. Poles programmed in PROG Menu

F = Frequency in Hz

DIAG = represents diagnostic pages. The values contained in these pages are for factory testing only

- MDL = Model number
- Ver1 and Ver2 = Version number
- D1 = Display scanning
- D2, D3, D4, D6, D7 = Data for Conserv's internal analysis
- D5 = Check Sum
- D11 = System type selected in PROG menu
- D13 = Label selected in PROG menu

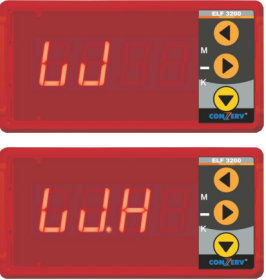
8.1 Display screens



RMS:
The RMS block comprises of instantaneous readings.
Refer Sections 7.1, 7.2, 7.3 for RMS parameters measured by each ELF model

INTG:
Energy Integrator, which provides several parameters for Energy Management.
Refer Section 5.1

OLD:
Stores the energy values from INTG when INTG is cleared (manually or overflow).
Refer Section 5.4



W:
Indicates watts (both total and phase wise values can be viewed).
Refer Section 7.1, 7.2, 7.3

W.H:
The first four digits of energy value (W.h.) are labeled with “W.H” (both uppercase).
Refer Section 5.2, 5.3



W.h:
The last four digits of energy value (W.h.) are labeled with “W.h” (h lowercase).
Refer Section 5.2, 5.3



DIAG:
Represents diagnostic pages. Scroll right to view the diagnostic values (these values are useful for factory testing only).
Refer Section 7.1, 7.2, 7.3



SET:
The user programmable parameters are displayed when you scroll right from SET.
Refer Section 3.2, 4.2



CLR:
Scroll right from the CLR page to reset the integrator to zero (i.e.erase the stored energy values)
Refer Section 5.4, 5.6



PROG:
Display PROG indicates start of PROG Menu. Go left from this display page to enter PROG Menu.
Refer Sections 3.1,3.3,3.4, 4.1 enter PROG Menu
Section 3.2 for Setup parameters
Section 4.2 to edit and save parameters



RUN:
Scroll right from the RUN page to enter the display mode and view the display parameters
Refer Section 7.1, 7.2, 7.3

8.2 Warranty & Calibration

Warranty as per company warranty policy

Statement of Calibration

Our instruments are inspected and tested in accordance with specifications published by an independent testing facility. The accuracy and calibration of our instruments are traceable to the National Institute of Standards and Technology through equipment that is calibrated at planned intervals by comparison to certified standards.