DMVA 100-PS

SOLID STATE DUAL DISPLAY/THREE-PHASE DIGITAL VOLTS MONITOR

User's Installation & Operation Manual
and
User's Programming Manual

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INSTALLATION & OPERATION

CHAPTER 1

MECHANICAL INSTALLATION

The following diagrams display the various possible DMVA100-PS mechanical installations and Communication Converter installation.

NOTE: ALL MEASUREMENTS ARE IN INCHES.

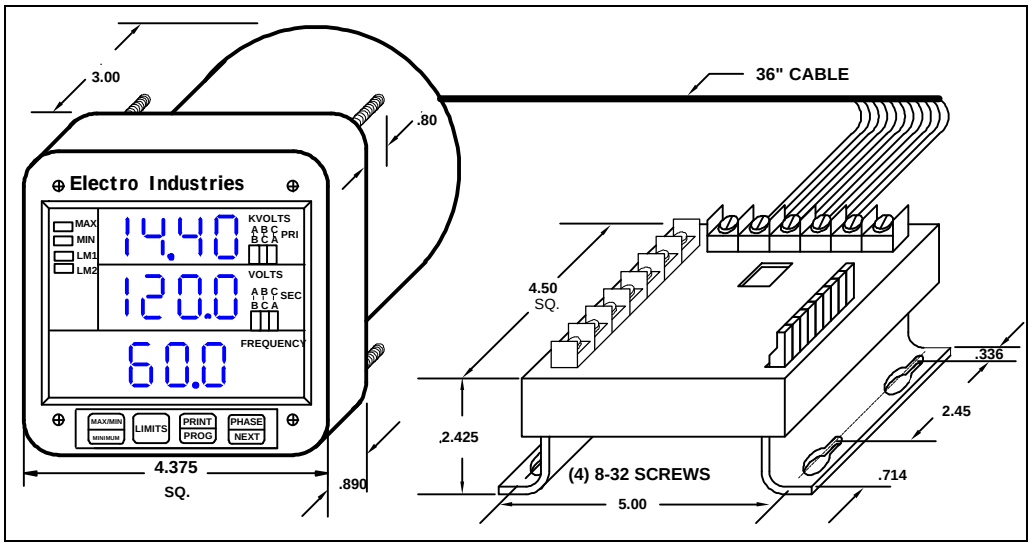


Diagram 1.1 Installation of the DMVA100 with K-110 Option for limited space conditions.

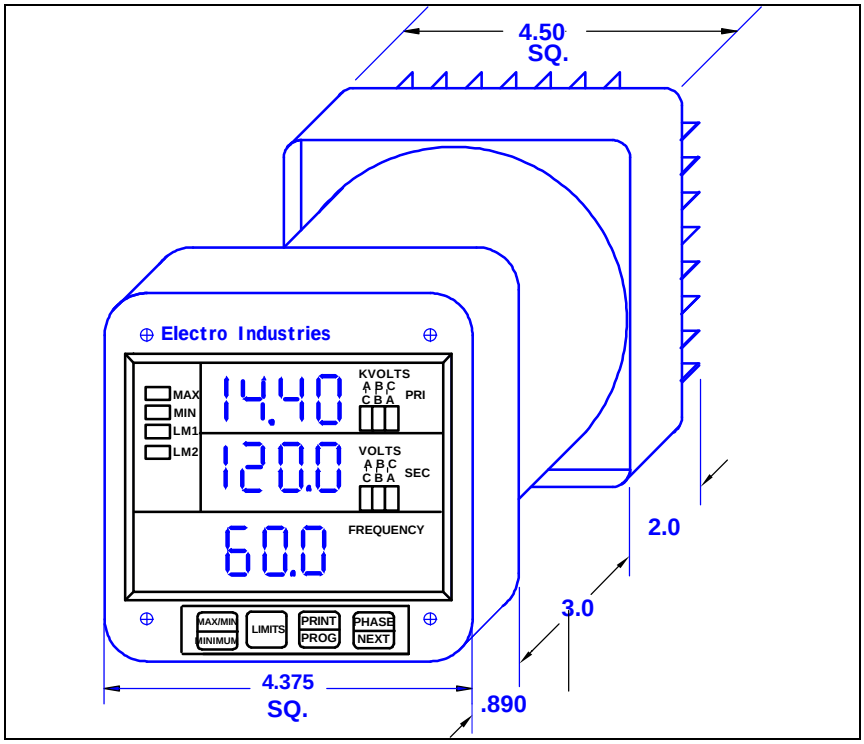


Diagram 1.2 Standard Installation of the DMVA100-PS

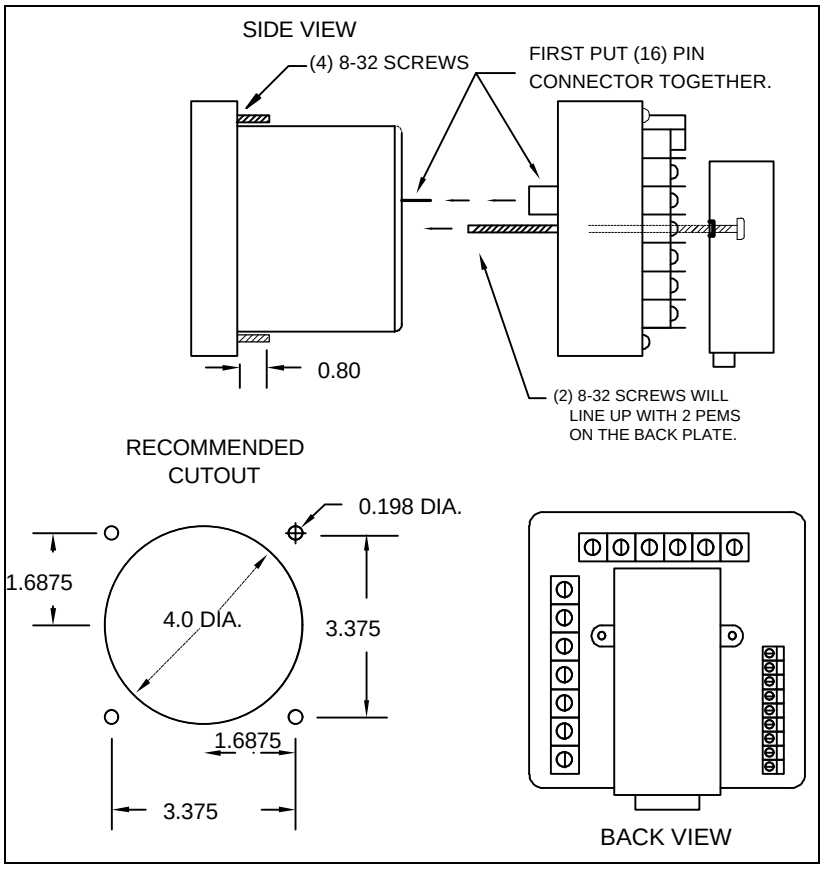


Diagram 1.3 Standard cutout for DMVA100-PS.

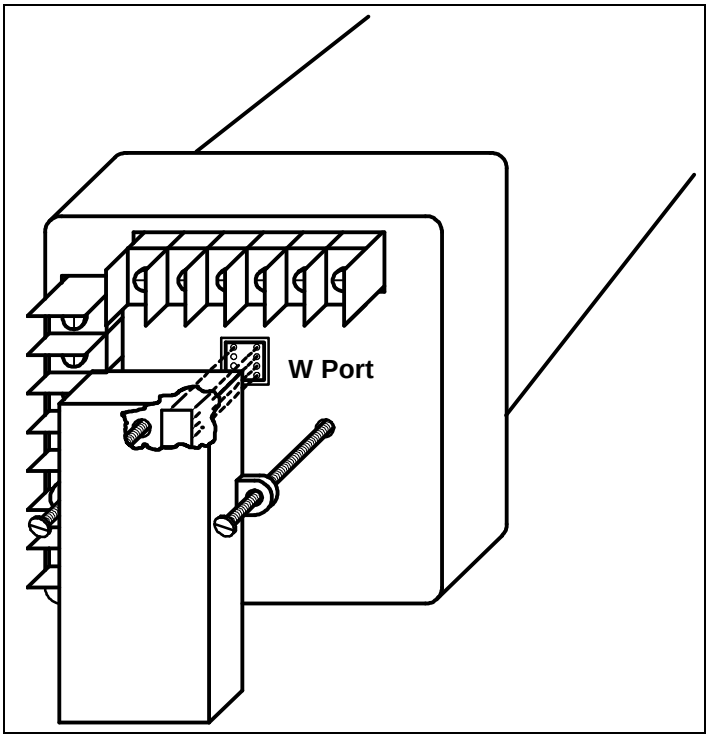


Diagram 1.4 Optional Communication Converter or DC Output Module Installation

NOTE: CAREFULLY LINE UP THE GUIDE SCREW AND 8 PIN PORT CONNECTOR TO PREVENT PINS FROM BREAKING

CHAPTER 2
ELECTRICAL INSTALLATION

2.1 CONNECTING THE CURRENT CIRCUIT

The cable used for the current should be installed at 600V AC minimum. The cable connector should be rated at 6 Amps or greater, and it should have a cross-sectional area of 16 AWG.

The current transformers should be mounted as close as possible to the meter. The following table gives the maximum recommended distances for various CT sizes, assuming the connection is made via 16 AWG cable.

CT SIZE (VA)	MAXIMUM DISTANCE (CT TO DMMS)
2.5 VA	10 FEET
5.0 VA	15 FEET
7.5 VA	30 FEET
10.0 VA	40 FEET
15.0 VA	60 FEET
30.0 VA	120 FEET

WARNING: DO NOT LEAVE SECONDARY OF CT WHEN PRIMARY CURRENT IS FLOWING. THIS MAY CAUSE HIGH VOLTAGE WHICH OVERHEATS THE SECONDARY OF THE CT. IF THE CT IS NOT CONNECTED, PROVIDE A SHORTING BLOCK ON THE SECONDARY OF THE CT.

2.2 CONNECTING VOLTAGE CIRCUIT OF POTENTIAL TRANSFORMER

For proper operation, the voltage connection *must* be maintained. If an error occurs, such as mistaking Line A for Line B, a PH message appears, indicating a Phase Reversal (see Phase Imbalance and Reversal).

The cable required to terminate the voltage sense circuit should have an insulation rating greater than 600V AC and a current rating greater than 0.1 A.

2.3 SELECTING THE VOLTAGE FUSES

We recommend using fuses, although connection diagrams do not show them. Slow blow, 200 mA rating fuses should be used.

The maximum voltage DMVA100-PS can handle 150V phase to neutral. If Suffix -G is added to the model number, the maximum voltage to be used is 300V phase to neutral.

2.4 CONNECTION TO THE MAIN POWER SUPPLY

The DMVA100-PS requires a separate power supply connection. Listed are the 5 different power supply options and corresponding.

NOTE*:* FOR DC-POWERED UNITS POLARITY MUST BE OBSERVED. AN EARTH TO GROUND CONNECTION TO CHASSIS IS MANDATORY FOR NORMAL OPERATION (TERMINAL 3). DO NOT GROUND THE UNIT THROUGH THE NEGATIVE OF THE DC SUPPLY. SEPARATE GROUNDING IS REQUIRED.

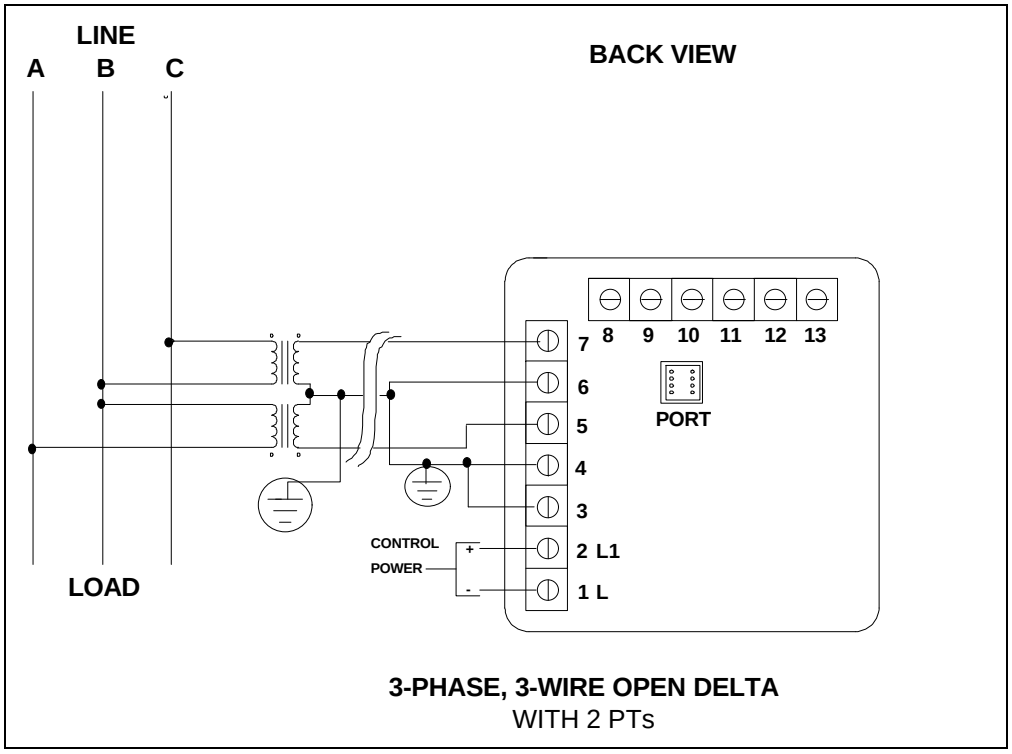
POWER SUPPLY OPTIONS	SUFFIXES	CURRENT
120V AC	NO SUFFIX	.1 AAC
240V AC	A	.05 AAC
24V DC	D	.5 ADC
48V DC	D1	.25 ADC
125V DC	D2	.1 ADC

2.5 ELECTRICAL CONNECTION INSTALLATION

Choose the diagram that best suits your application and maintain the polarity. Follow the outlined procedure to verify correct connection.

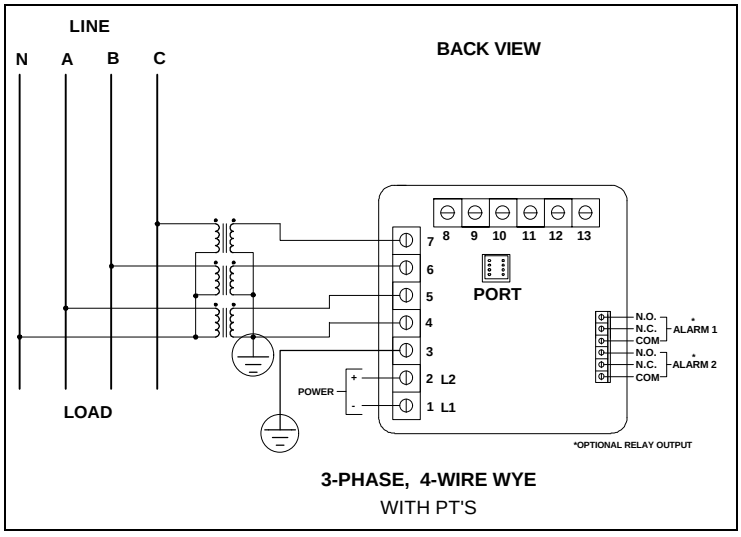
CONNECTION DIAGRAMS

I. Open Delta PT Connection Three-Phase, Three-Wire Open Delta with and two PTs.
(*Open Delta System Installation should only be used if the electrical system is a 3-wire OPEN DELTA. Open Delta can be enabled or disabled in Programming Group 0, Function 3.)*



3-PHASE, 3-WIRE OPEN DELTA
WITH 2 PTs

II. Three Phase, Four-Wire Wye Connection



3-PHASE, 4-WIRE WYE
WITH PT'S

NOTE ON ABOVE DIAGRAMS: SEE PHASE REVERSAL IF A MESSAGE OF PH APPEARS AFTER INSTALLATION.
SPECIAL PROGRAMMING IS REQUIRED FOR BOTH CONNECTION DIAGRAMS.

2.6 RELAYS AND PROTECTION

NOTE: THIS SECTION IS APPLICABLE ONLY IF THE -NL RELAY OPTION WAS ORDERED.

The DMVA100-PS's allows the user to access a variety of relay options through the programming mode. The relay option package consists of two relays, which can be dedicated to alarm or communication (or both).

TIME DELAY: Sets off the alarm, alerting the user that an out-of-limits condition occurred during the defined time limit. The time delay can be programmed for any desirable duration.

If the relays are dedicated to communication, there are two different modes:

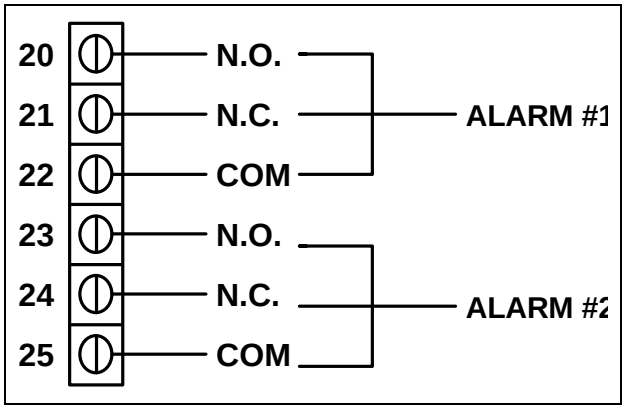
- Lock ON Relay will not be affected by any alarm condition.
- Lock OFF Relay will not be affected by any alarm condition.

If the relays are used for communication and alarm, there are four different modes:

- Lock ON Relay stays on regardless of any alarm condition.
- Lock OFF Relay stays off regardless of any alarm condition.
- Free ON Relay turns on unless other conditions force it off.
- Free OFF Relay turns off unless other conditions force it on.

Figure 2.1 - Relay Connection

Close-up of the relays on the rear panel. The relays shown are in the NOT energized state. (Form C relays, rated 250V, 5A, 2 each)



THE INSTRUMENT CAN BE PROGRAMMED TO DETECT TWO ALARM LEVELS FOR THE FOLLOWING FUNCTIONS:

- LM1/LM2 Voltage AN, BN, CN, AB, BC, CA
- LM1/LM2 Current A, B, C, N
- Voltage Imbalance (One level only)
- Voltage Phase Reversals (One level only)

CHAPTER 3
COMMUNICATION INSTALLATION

3.1 RS-232C

All DMVA100-PS's can be equipped with: the EIA RS-232C or the EIA RS-485.

RS-232C communication links a single instrument with a computer. Its capability is capable up to 100 feet. A standard 9-pin female serial port connector mounts on the instrument for direct connection to a computer with a 9-pin cable.

NOTE: ONLY THREE PINS ARE USED IN RS-232C. (See **Figure 3.1**).

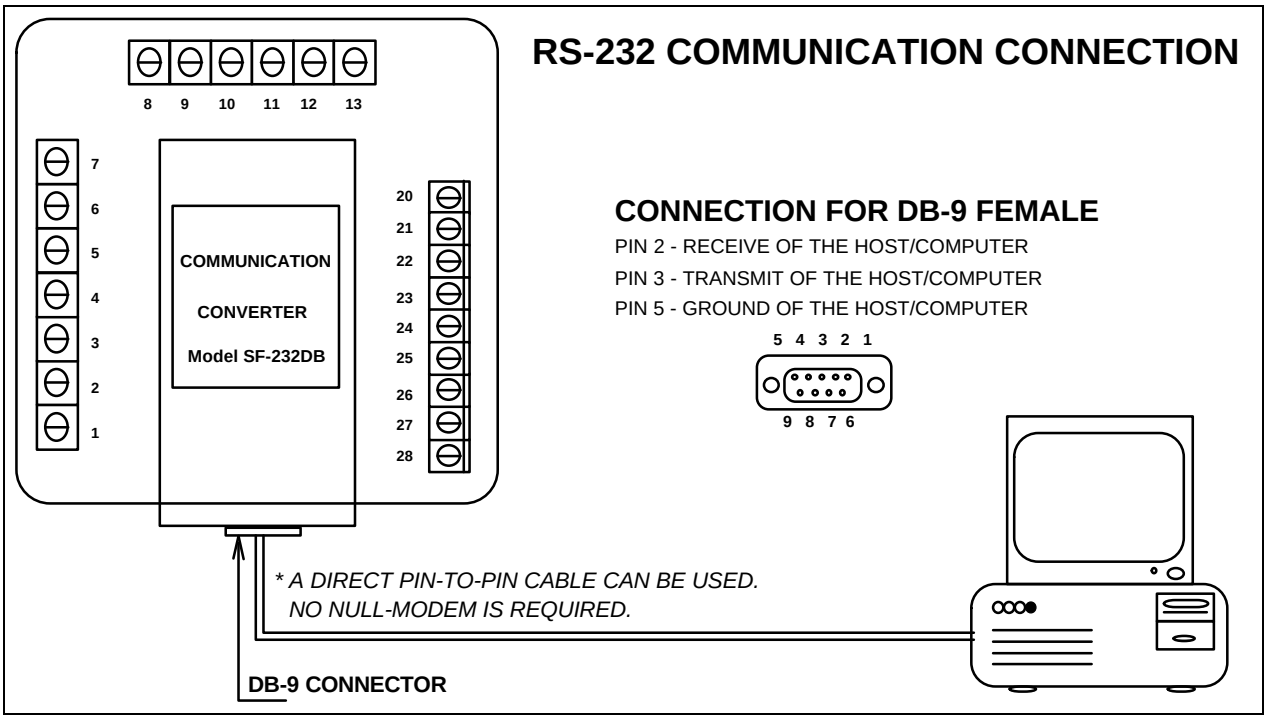


Figure 3.1 *RS-232C Communication Connection Installation*

NOTE: TO AVOID GROUND LOOPS, THE NEUTRAL AND SAFETY GROUND (PIN 3) SHOULD BE CONNECTED TOGETHER AT ONLY ONE POINT.

3.2 RS-485

NOTE: THIS SECTION APPLIES ONLY IF A COMMUNICATION OPTION WAS ORDERED.

Each DMVA100-PS has an unique address up to four digits long. This allows the user to communicate with up to 10,000 instruments. Standard baud rates are available up to 4800 baud. To select the proper baud rate, apply the following rules:

> *The unit operates up to 4800. For a smaller number of instruments over a long distance, use a lower baud. Optimal recommended baud rate is 1200 baud if noisy conditions exist.*

RS-485 is used to parallel multiple instruments on the same link. Its operating capability is up to 4000 feet.

- When only 2 wires are used (on the RS-485), the link can include up to 30 instruments, (Figure 3.2).
- When using all 4 wires, the link can include up to 60 instruments, (Figure 3.3).

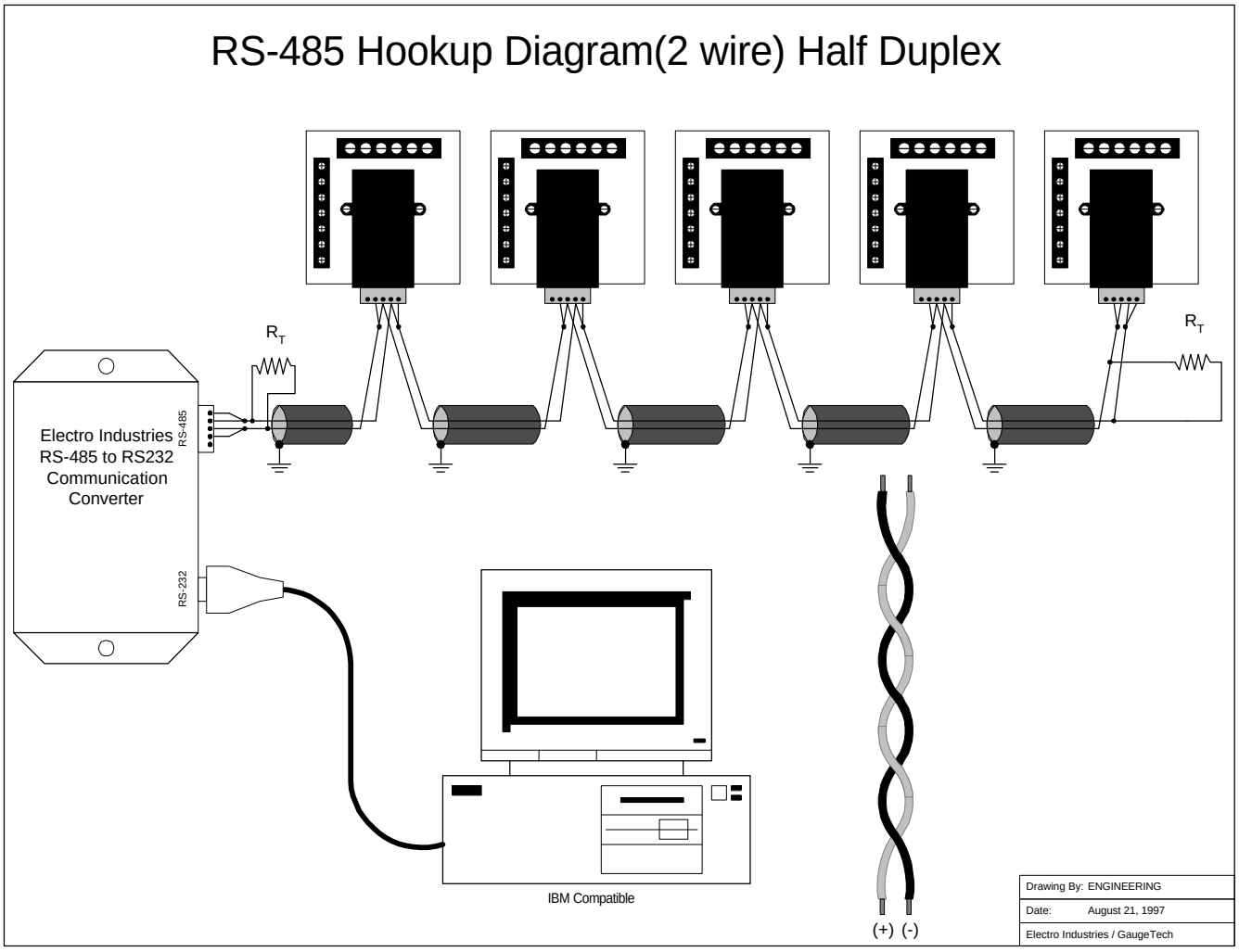


Figure 3.2 *2Wire RS-485 Communication Connection Installation Half Duplex*

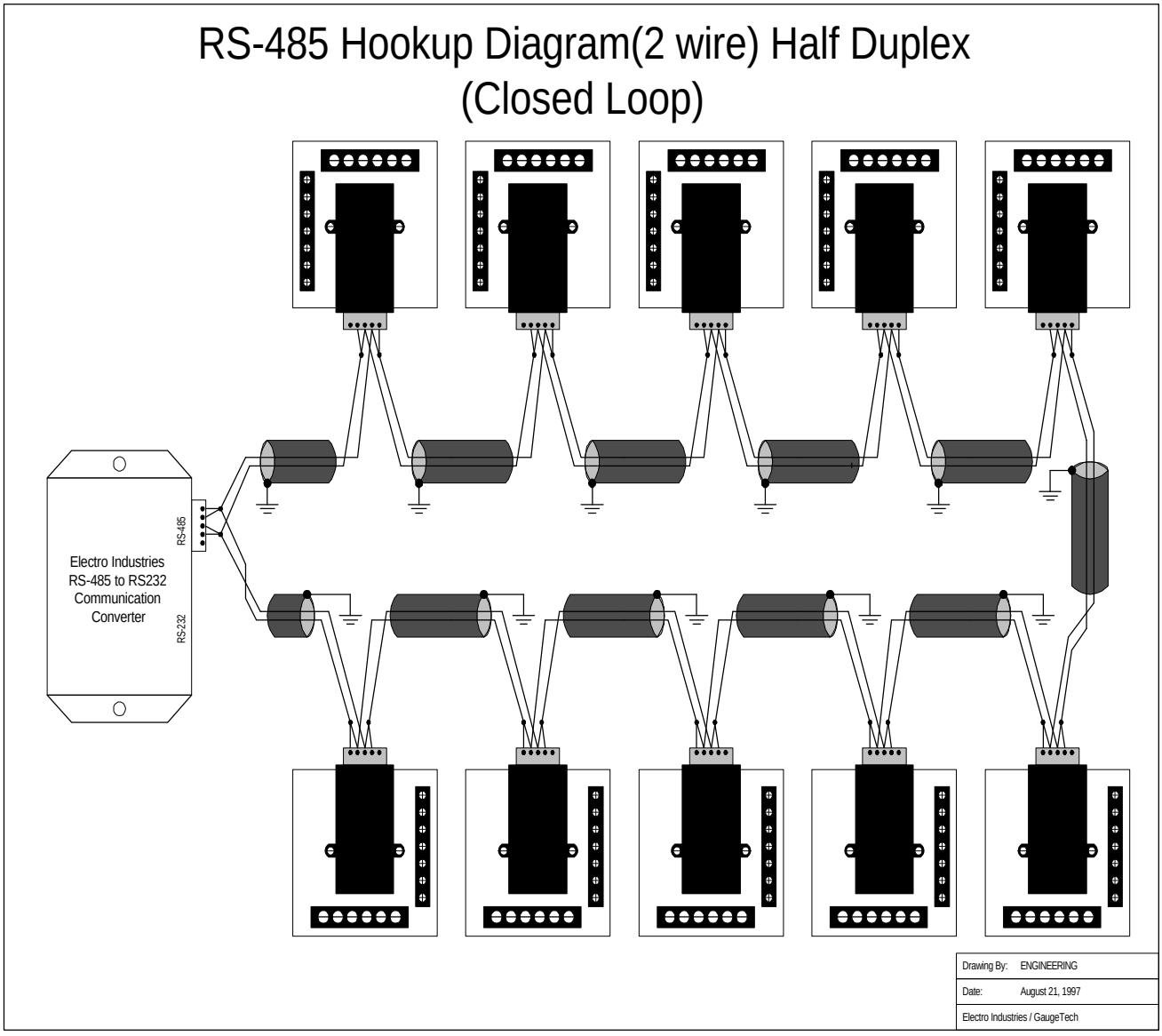


Figure 3.3 *2-Wire RS-485 Communication Connection Installation Half Duplex (closed loop)*

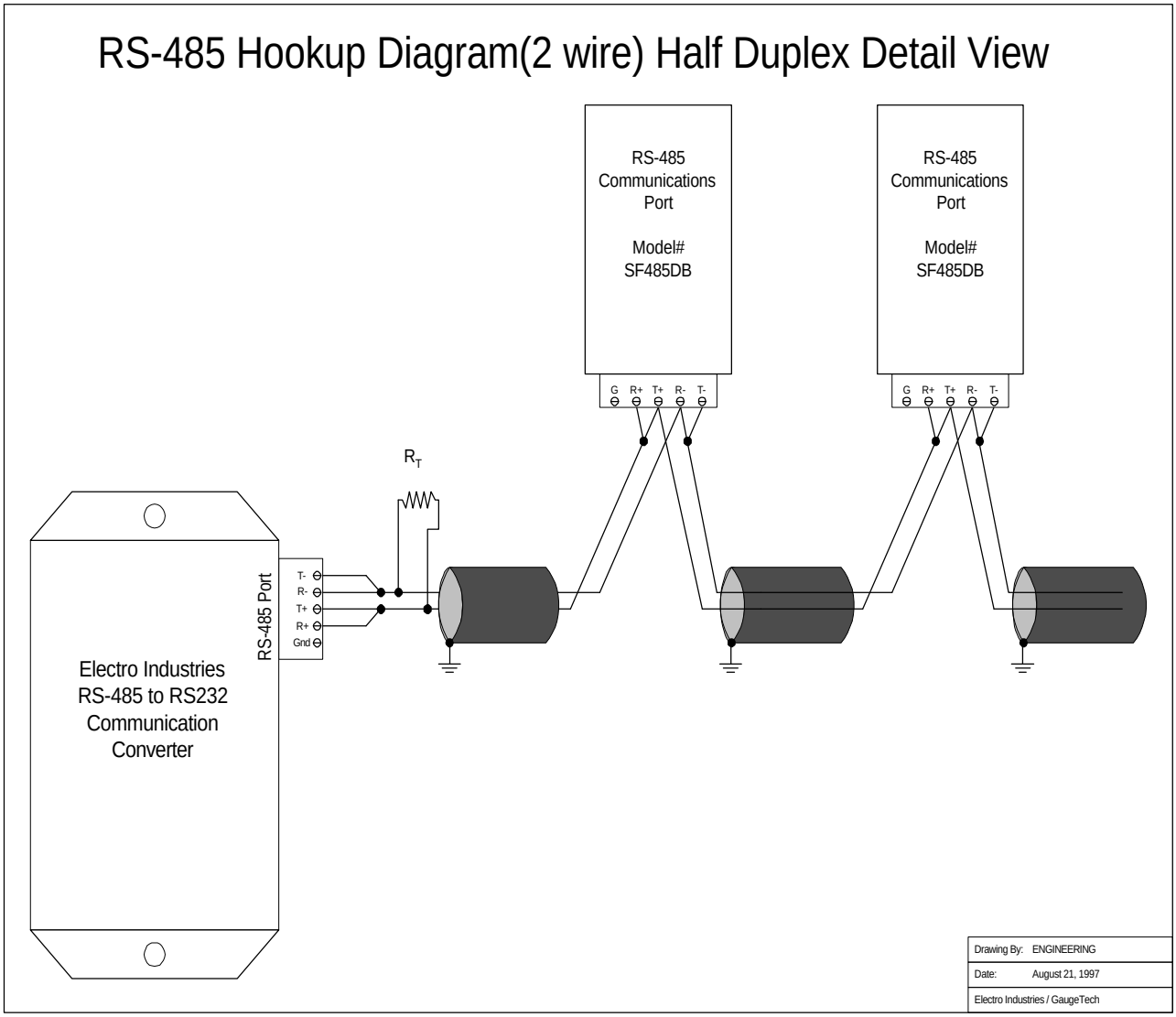


Figure 3.4 *2-Wire RS-485 Communication Connection Installation Half Duplex Detail View*

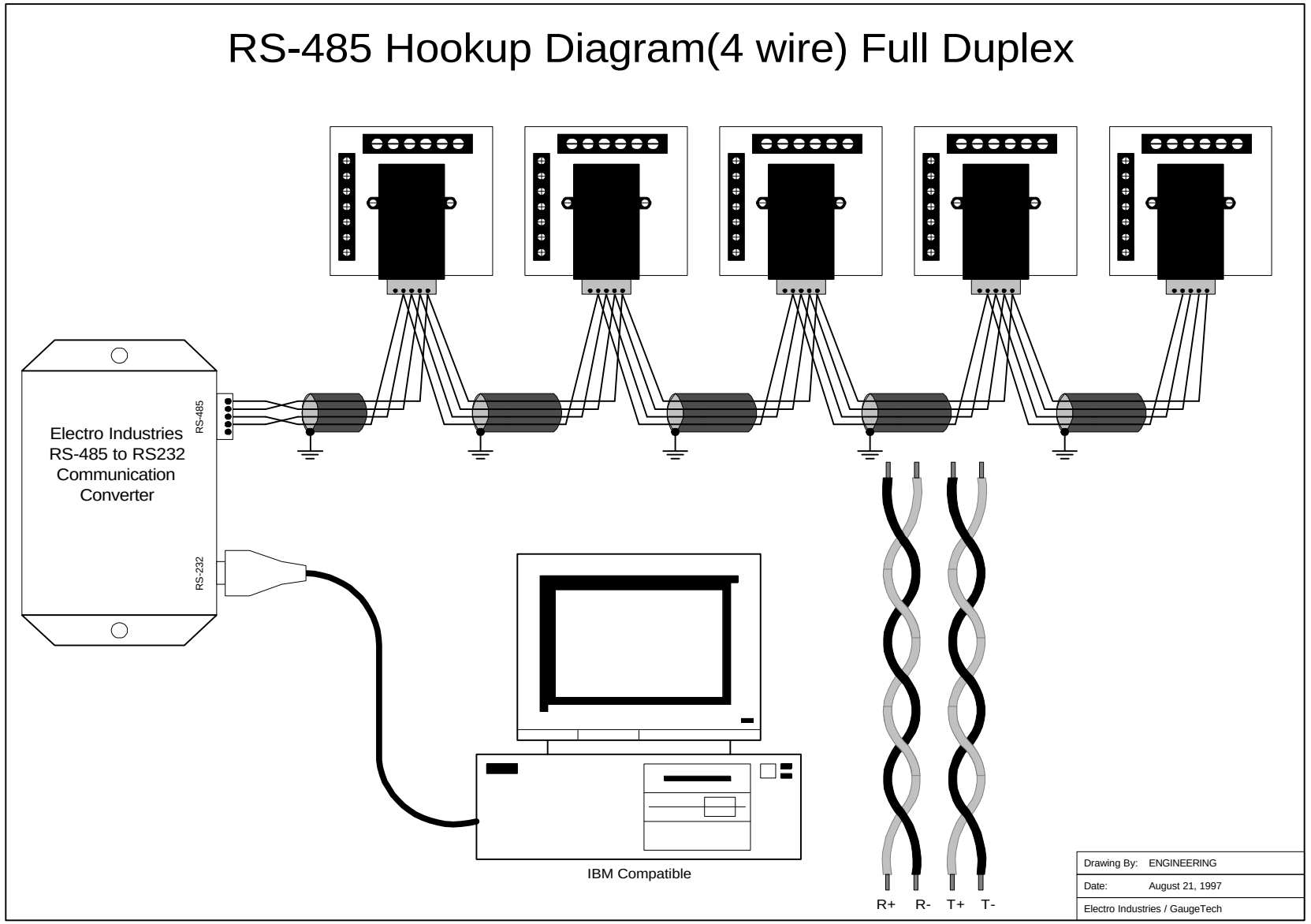


Figure 3.5 *4-Wire RS-485 Communication Connection Installation Full Duplex*

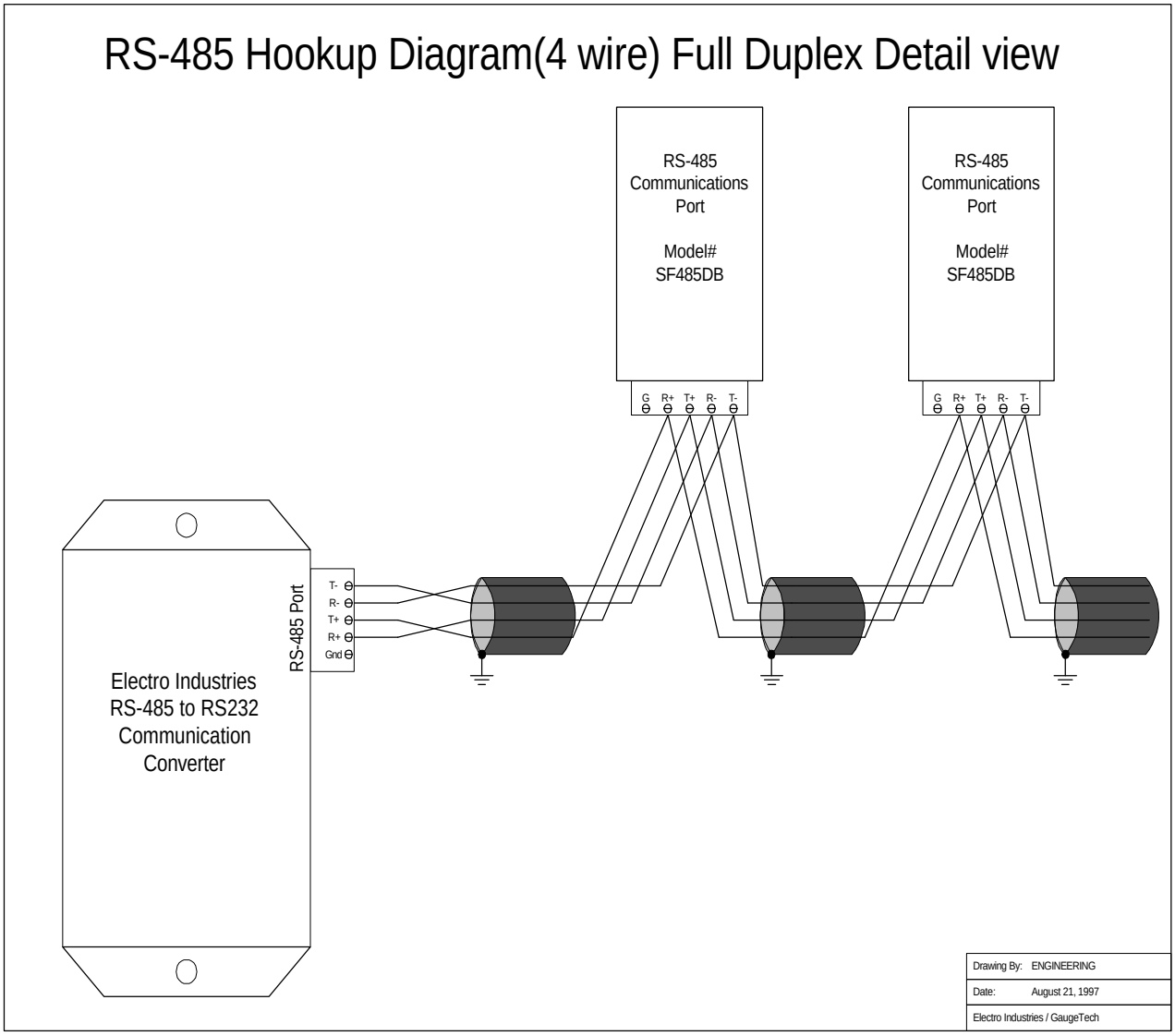


Figure 3.6 *4-Wire RS-485 Communication Connection Installation full duplex detail view*

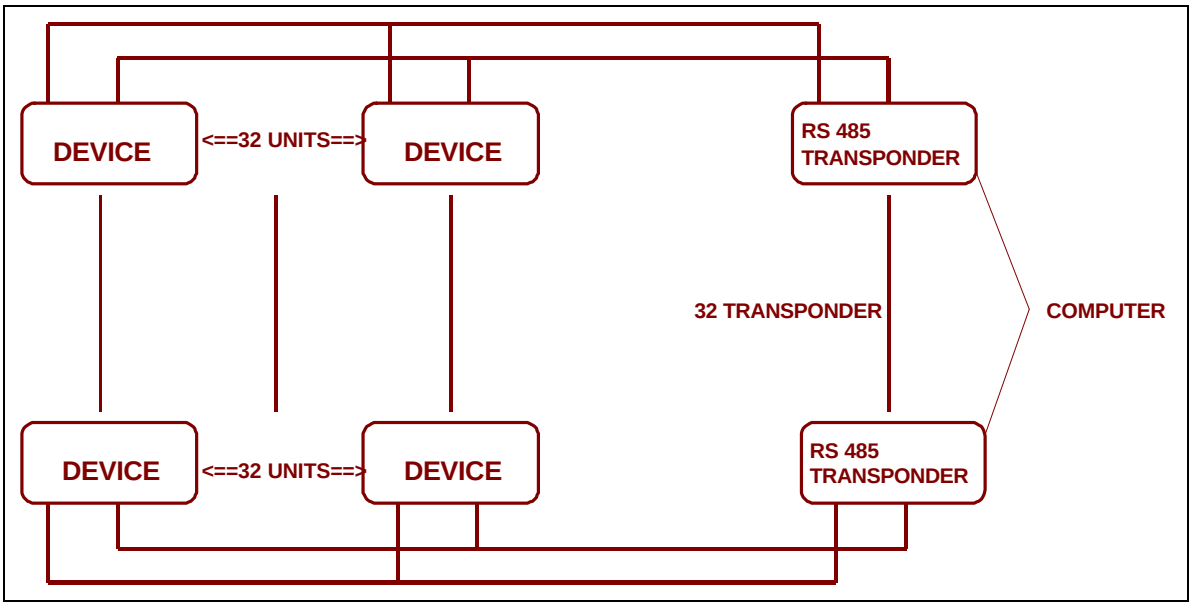


Figure 3.7 *2-Wire RS-485 Communication Installation Connection with Transponder*

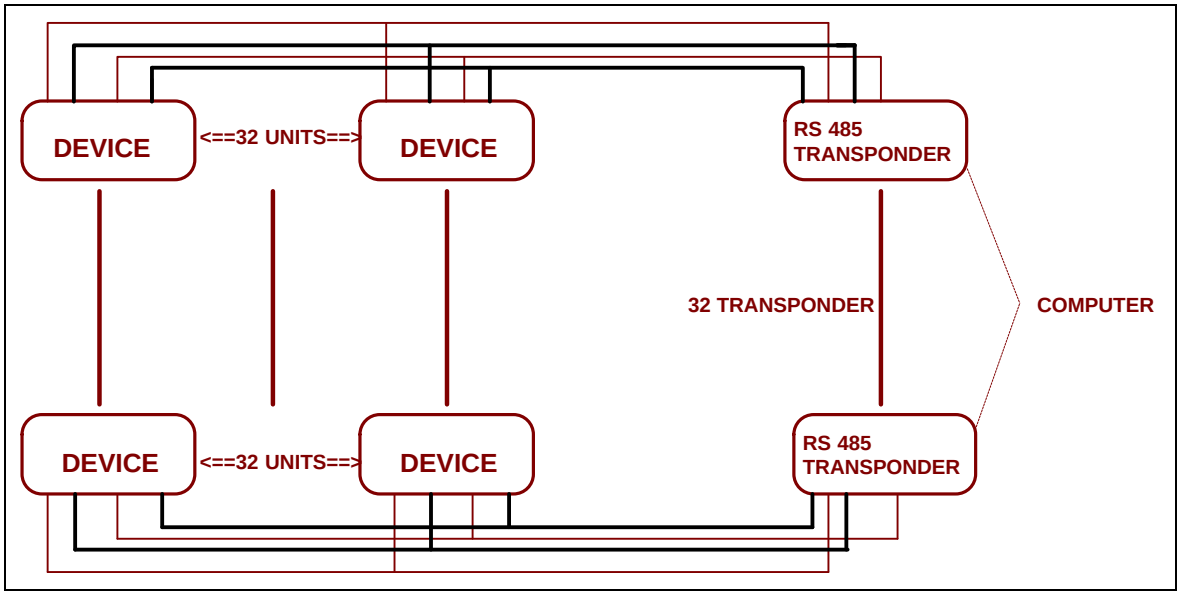


Figure 3.8 *4-Wire RS-485 Communication Installation Connection with Transponder*

3.3 Network of Instruments and Long Distance Communication

The RS-485 Transponder is required for a large network of instruments.

- In a two-wire connection, a maximum of 900 instruments can be included in the same network, (Figure 3.4).
- Meanwhile, in a four-wire connection, a maximum of 3600 instruments can be included in the same link, (Figure 3.5).

Use modems (dedicated or dial-up) when the instruments are located at great distances. However, set the modem to auto answer at the recommended value of 1200 baud rate if noise conditions exist. Also, flow control must be disabled.

CHAPTER 4
DMVA 100-PS OVERVIEW

The DMVA100-PS measures 10 electrical parameters. Values for each parameter are accessed through the keypad on the meter's front panel (See **Figure 4.1**).

VOLTAGE PRIMARY AND SECONDARY
A-B
B-C
C-A

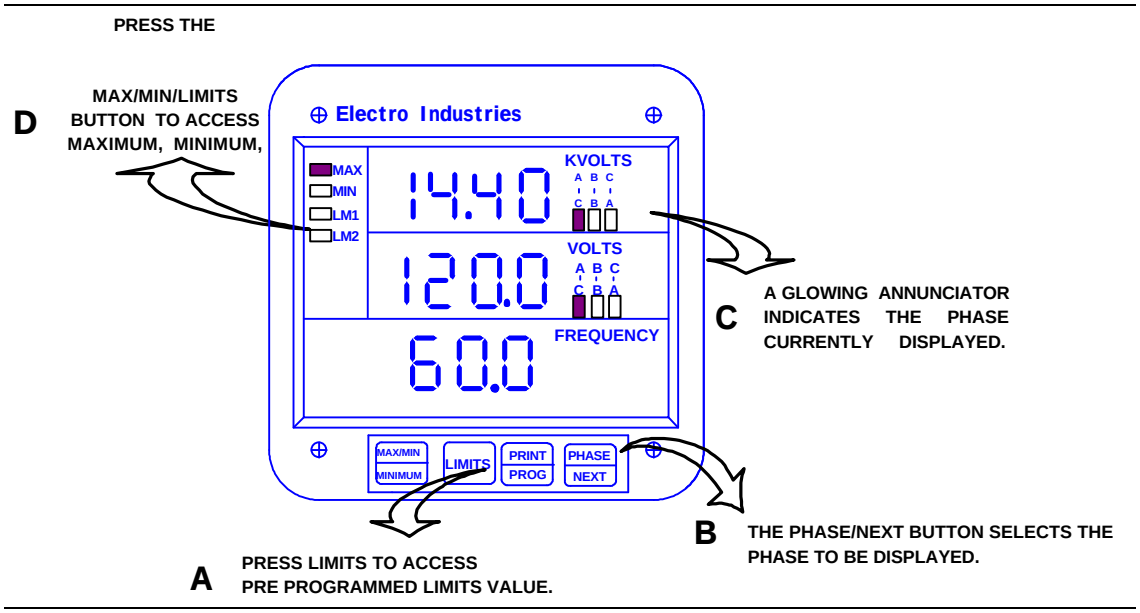
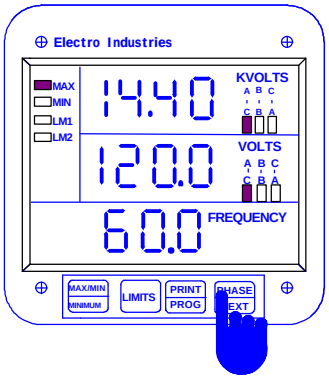


Figure 4.1
The DMVA100-PS front panel with display and keypad

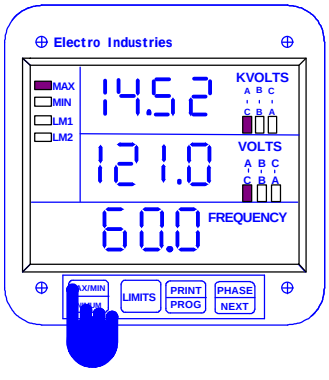
4.1 ACCESSING MAX/MIN VALUES FROM OPERATING MODE

The max/min values represent the highest and lowest average demand over a user programmable time period, know as the **INTEGRATION INTERVAL**. The readings are calculated using a rolling average technique. Each second, a new reading is used to calculate the max/min and the last reading of the interval is dropped.

⇨To **ACCESS MAX/MIN VALUES**, follow these steps:



Step 1:
a. Press ***PHASE/ NEXT*** until the desired phase is selected.



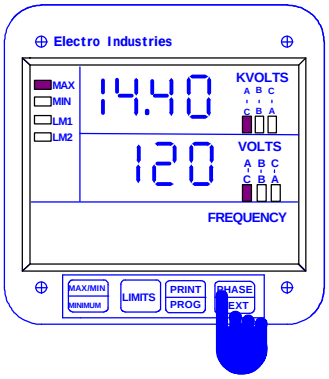
Step 2:
a. Press ***MAX/MIN/ LIMITS***:
⇨ONCE for max of VOLT A-N
⇨TWICE for min of VOLTS A-N

4.2 RESETTING VALUES FROM OPERATING MODE

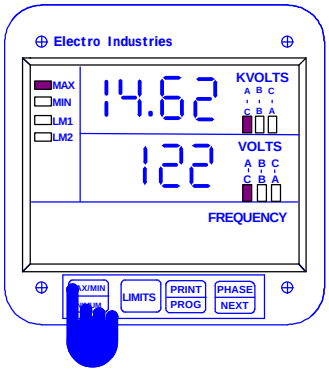
Use the reset function if a new value is desired. It is available in two different modes:
The standard factory settings is the unprotected mode.

1. **UNPROTECTED MODE:** allows quick and easy resetting of max/min values.
2. **PROTECTED MODE:** prevents unauthorized personnel from resetting the max/min.
3.

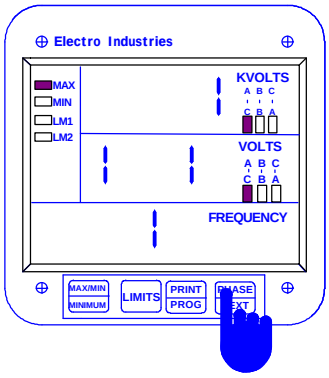
❑ **UNPROTECTED RESET**



Step 1:
a. Press ***PHASE/ NEXT*** until the desired phase is selected.



Step 2:
a. Press ***MAX/MIN/ LIMITS***:
⇨ONCE for max
⇨TWICE for min

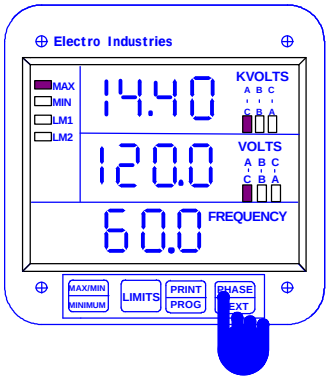


Step 3:
a. Press *PHASE/NEXT* to reset.

⇒ The display blanks and a checkmark appears confirming successful reset.

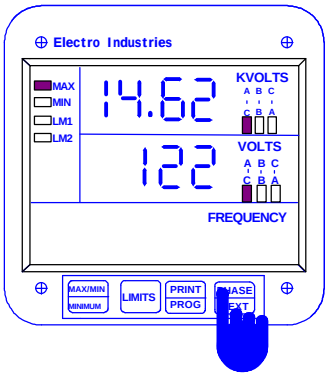
❑ **PROTECTED RESET**

NOTE: IF THE METER WAS PROGRAMMED TO HAVE A PROTECTED RESET, A PASSWORD MUST BE ENTERED BEFORE ANY READINGS MAY BE RESET. THE PASSWORD IS ***005*.**



Step 1:
a. Press ***PHASE/NEXT*** to select the desired phase.

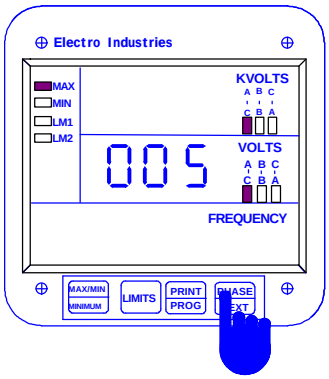
b. Press ***MAX/MIN/LIMITS:***
⇨ONCE for max
⇨TWICE for min

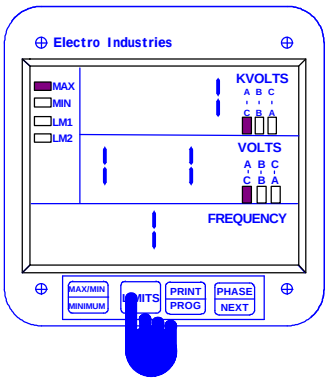


Step 2:
a. Press ***PHASE/NEXT*** to commence the Protected reset.

⇨The display blanks, three dashes appear in lower display and digits begin scrolling in upper display.

⇨The password required is ***005***.





Step 3:
a. Press ***PHASE/NEXT*** twice to enter two zeros and press again when the counter reaches the number five.

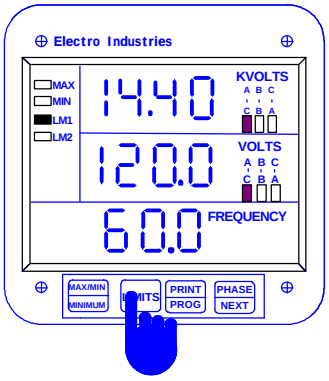
Step 4:
⇨Upon entering the correct password, the display blanks and a checkmark appears, confirming successful reset.

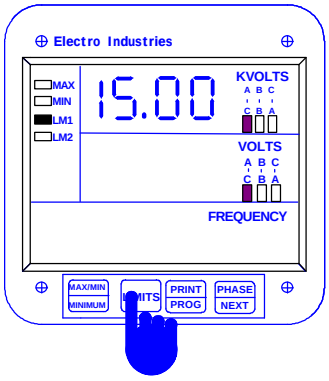
4.3 ACCESSING THE LM1/LM2 SET LIMITS FROM OPERATING MODE

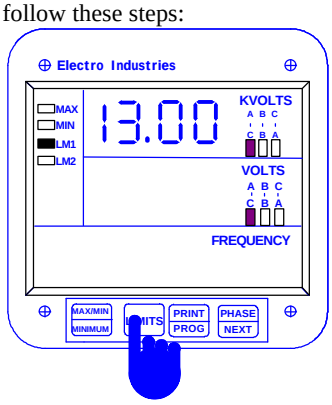
The DMVA100-PS is designed with two manual set limits. The set limits monitor the instantaneous readings, warning the user of abnormal conditions. Each limit can detect readings above or below the set level. **SET LIMITS:** the point when the relay changes position, if the DMVA100-PS is equipped with the Relay Option (Suffix -NL).

If a limit is exceeded, the annunciator LM1 and/or LM2 indicator glow and the display flashes, alternating between the instantaneous reading.

⇨To **VIEW THE SETUP OF THE LM1/LM2 SET LIMITS OF THE FUNCTIONS**, follow these steps:







Step 1:
a. To access the set limit, press ***LIMITS:***
⇨**ONE** times for LM1
⇨**TWO** times for LM2

Step 2:
a. Press ***PHASE/NEXT*** when the LM1 annunciator glows.

⇨The annunciators that glow are out-of-limits in LM1.

Step 3:
a. Press ***PHASE/NEXT*** when the LM2 annunciator glows.

⇨The annunciators that glow are out-of-limits in LM2.

ACCESS MODE

Sections **4.6**, **4.7** and **4.8** allow the user to access specific operation tasks (see table below).

ACCESS	OPERATION
1	Print Operating Data
2	Print Programming Data
3	Enter Programming Mode (see Programming Section)
4	LED Test/ View Firmware Version

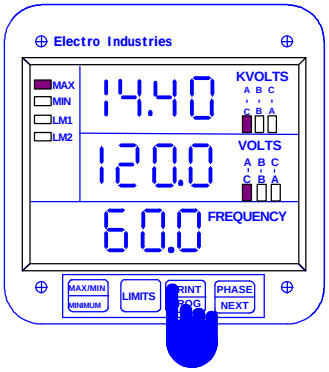
NOTE: PRINT COMMANDS 1 AND 2 ARE ONLY AVAILABLE IF ENABLED IN THE PROGRAMMING MODE AND ARE NOT RECOMMENDED WHEN USING THE MULITMETER CONNECTION RS485.

4.4 PRINTING OPERATING DATA FROM OPERATING MODE

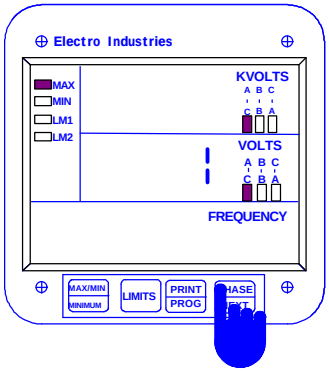
NOTE: THIS FUNCTION APPLIES ONLY IF A SERIAL PRINTER IS CONNECTED TO THE DMVA 100-PS VIA AN RS232C COMMUNICATION CONVERTER.

This function sends the data to a serial printer. This allows hard copy of the instantaneous and max/min data of all the functions to compile without manually copying the data.

⇨To **PRINT THE OPERATING DATA**, follow these steps:

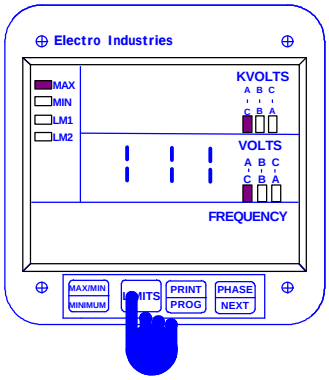


Step 1:
a. Press ***PRINT/PROG*** to begin the special printing sequence.



Step 2:
a. The display blanks and ***1*** appears.

b. Press ***PHASE/NEXT*** to select.



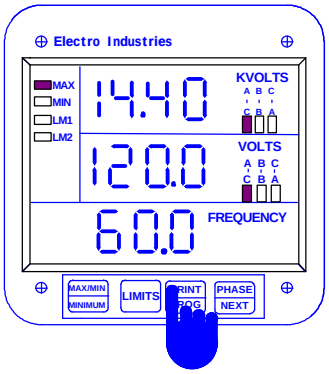
⇨***111*** appears confirming a successful print command.

4.5 PRINTING PROGRAMMING DATA FROM OPERATING MODE

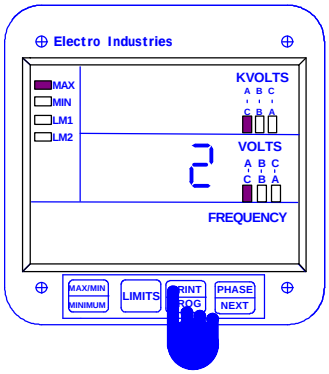
NOTE: THIS FUNCTION APPLIES ONLY IF A SERIAL PRINTER IS CONNECTED TO THE DMVA 100 VIA AN RS232C COMMUNICATION CONVERTER.

This function sends the programming data (or the meter setup) to a serial printer for verification and quick reference.

⇨To **PRINT THE PROGRAMMING DATA**, follow these steps:



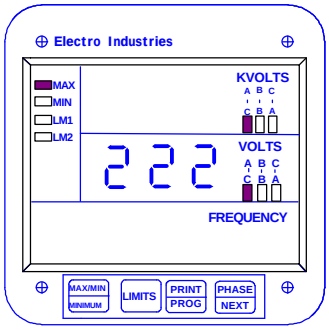
Step 1:
a. Press ***PRINT/PROG*** to enter the access mode.



Step 2:
⇨The display blanks.

a. Press ***PRINT/PROG*** until ***2*** appears.

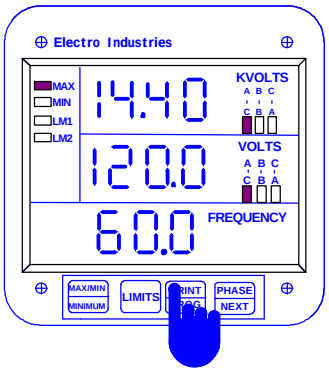
b. Press ***PHASE/NEXT*** to select.



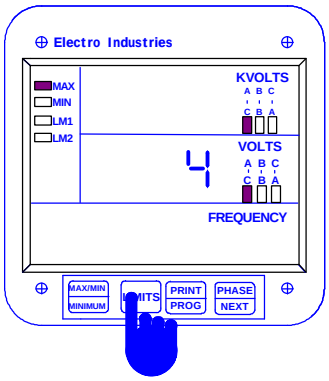
⇨***222*** appears confirming a successful print command.

4.6 LED TEST FROM OPERATING MODE

The DMVA100-PS is equipped with an LED test to check if the LEDs and annunciators are functioning properly.

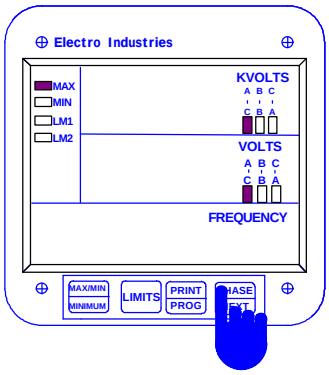


Step 1:
a. Press ***PRINT/PROG*** to enter the Access Mode.



Step 2:
⇨The display blanks.

a. Press ***PRINT/PROG*** until ***4*** appears.

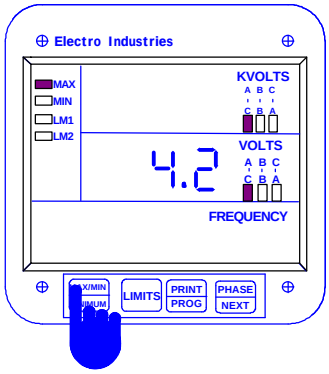


Step 3:
a. Press ***PHASE/NEXT*** for the LED test.

⇨All segments and annunciators glow.

4.7 ACCESSING FIRMWARE VERSION FROM OPERATING MODE

The DMVA100-PS is equipped with a function to access the firmware version.



Step 1:
a. Disconnect power to the meter.

b. Press ***MAX/MIN/LIMITS*** upon power up.

⇨Upper display indicates the version number.

OR

Press *PRINT/PROG* until a 4 appears and press *MAX/MIN*.

PROGRAMMING YOUR DMVA 100-PS

CHAPTER 1

GENERAL PROCEDURE OVERVIEW

1.1 HOW TO USE THIS PORTION OF THE MANUAL

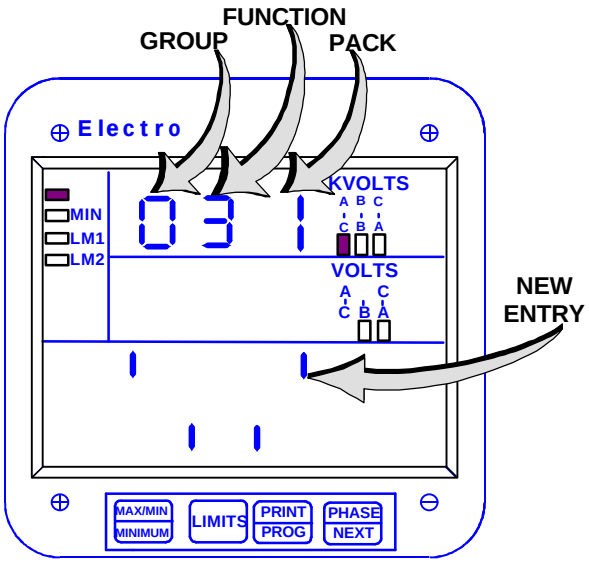
This manual contains programming for basic operation, available options and parameters. Using the Table of Contents or "Quick Reference Guide", find the programming feature location and read that chapter.

Programming tasks are arranged into nine major GROUPS. Within each GROUP are the specific meter FUNCTIONS. Outlined is the general approach to alter programming mode values.

1. Enter the Programming Mode.
2. Select the desired GROUP.
3. Select a FUNCTION within the GROUP.
4. After the FUNCTION selection, proceed with DATA ENTRY of the new value for the desired parameter.
5. Proceed to program another location and/or exit the programming mode.

IMPORTANT: THE FULL EXITING PROCEDURE MUST BE FOLLOWED TO STORE ANY NEW PROGRAMMING.

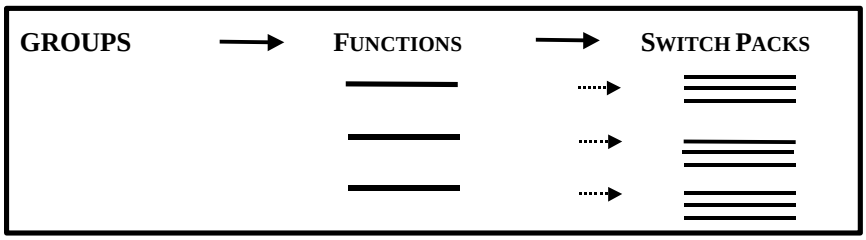
1.2 SWITCH PACKS



GROUPS, Functions, and Switch PACKS:

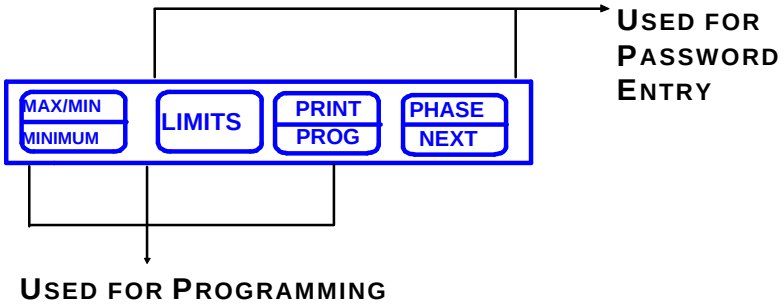
- GROUPS are the main category.
- Functions are sub categories of GROUPS.
- Switch PACKS are sub categories of Functions.

THE DIAGRAM BELOW ILLUSTRATES THE ARRANGEMENT OF THE THREE CATEGORIES:



NOTE: THESE ARE VERY SIMILAR TO DIP SWITCH CONCEPT.

1.3 PROGRAMMING MODE ENTRY

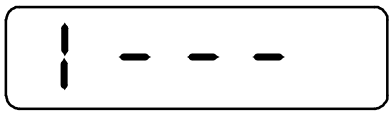


BUTTON	FUNCTION	DESCRIPTION
MAX/MIN	ADVANCE	Scrolls groups, functions, and advances to exit point from function and group level.
LIMITS	CHANGE VALUE	Scrolls packs, digit counters, and changes Switch PACK position UP or DOWN.
PRINT/PROG	STORE	Activates new data entry, stores digits, and enters or exits from group or function level.

1.4 STANDARD NUMERIC DATA ENTRY

Programmable FUNCTION values are always three digit numeric fields designed to accept any value between 000 and 1999. When entering the value of a function enter all three digits, leading zero's included. For instance, to enter 25, enter: 025.

When activating the Data Entry Sequence, certain Functions allow for a four digit entry. The display indicates a blank followed by three dashes (see diagram). The first digit may only be a ***1*** or a ***blank*** (*the blank signifying* ***0***). Press ***PRINT/PROG*** ONCE for ***0***, TWICE for ***1***.



CHAPTER 2
ENTERING THE PROGRAMMING MODE

2.1 CHECKSUM ERROR - PROTECTIVE MECHANISM

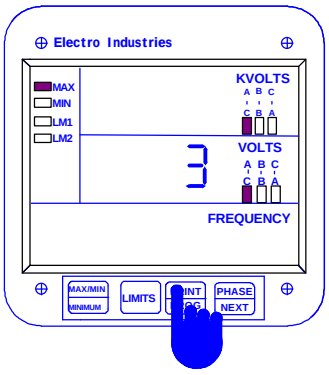
If the control power is interrupted while in Programming Mode or the user does not fully exit, the meter enters a checksum mode. The display blanks, except for the max LED. Press ***PRINT/PROG*** for several seconds and the unit recovers. Follow the procedure to enter the Programming Mode to check program data, then exit.

2.2 PASSWORD ENTRY

The DMVA 100-PS is password protected. To enter the programming mode, key in the following password. The password is ***555***.

NOTE: THE METER WILL NOT STORE ANY PROGRAMMING UNLESS PROPERLY EXITED. (SEE CHAPTER 8 TO EXIT).

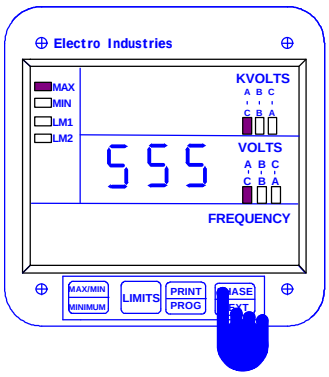
⇨ENTERING THE PROGRAMMING MODE:



Step 1:
a. Press ***PRINT/PROG*** until ***3*** appears in lower display.

b. Press ***PHASE/NEXT*** to select.

c. ***333*** appears in lower display.

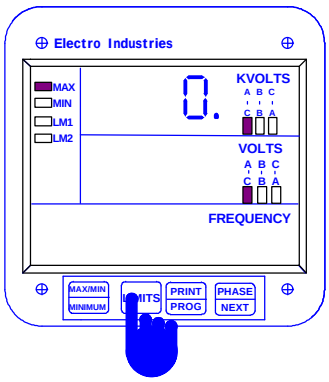


Step 2:
⇨Digits begin scrolling in upper display.

⌦The password is **555**.

a. Press ***PHASE/NEXT*** each time **5** appears.

⇨The selected digits appear in lower display.



⇨Display blanks and **PPP** flashes in upper display, confirming a correctly entered password.

⇨**PPP** is replaced by ***0.*** and the meter is now in the Programming Mode, GROUP 0.

CHAPTER 3

PROGRAMMING GROUP 0: GLOBAL METER SETUP

The Global Meter Setup includes Functions ***0*** through ***5*** that control configuration and basic operation. Below is an outline of GROUP 0 to assist in locating a feature. FUNCTION 3 System Configuration contains Switch PACKS with various options, including open delta installation and communications.

TABLE 3-1: GROUP 0 PROGRAMMING FORMAT

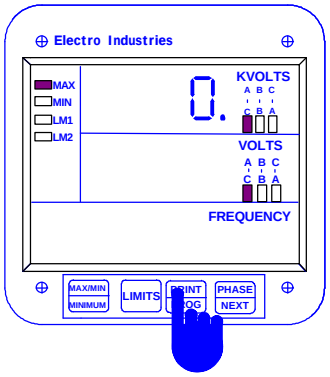
FUNCTION NUMBER	FUNCTION
0.	Integration Interval
1.	Meter Address for Communication
2.	Baud Rate for Communication
3.	System Configuration
4.	Relay 1 Set-up/Time Delay
5.	Relay 2 Set-up/Time Delay
E.	Exit Programming GROUP 0

3.1 GROUP 0, FUNCTION 0 - THE INTEGRATION INTERVAL

INTEGRATION INTERVAL: The time over which all instantaneous readings are averaged to obtain a maximum and minimum demand. The Integration Interval is entered in seconds. When entering 15 minutes, enter: 0900 seconds.

⇨To change the **INTEGRATION INTERVAL**, follow these steps:

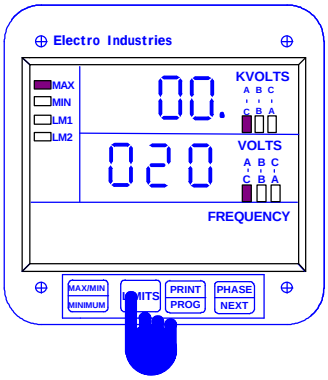
NOTE: PRESS ***MAX/MIN/LIMITS***, AT ANY TIME, TO CANCEL BEFORE STORING THE LAST DIGIT OR SWITCH.



Step 1:
a. Enter Group Level of Programming Mode, (see Chp. 2).

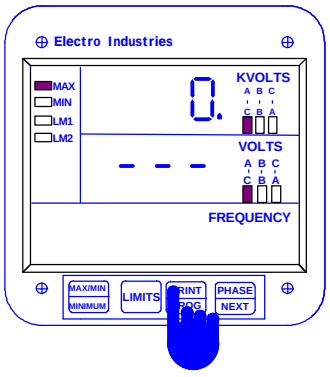
b. ***0.*** appears in upper display.

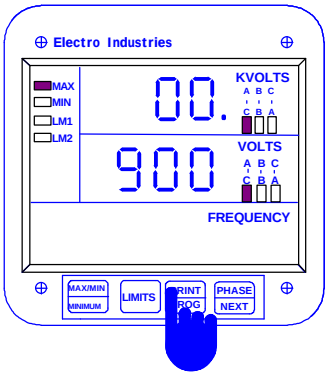
c. Press ***PRINT/PROG*** to activate the GROUP.



⇨***00.*** appears in upper display, indicating current Group and Function number.

⇨Lower display indicates current Interval setting.





Step 2:
a. Press ***PRINT/PROG*** to begin Data Entry Sequence.

⇨Three dashes appear in lower display.

b. Press ***LIMITS*** for desired number.
Press ***LIMITS*** once and the blank signifies zero.
Press ***PRINT/PROG*** twice and ***1*** appears for the first digits

c. Press ***PRINT*** to store and move to next digit.

⇨Repeat this procedure until new Integration Interval is entered.

⇨When complete, lower display indicates new Integration Interval.

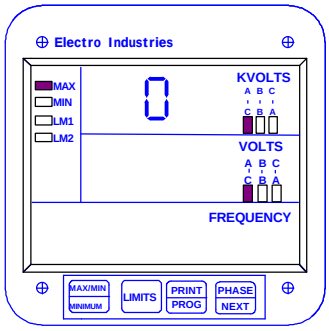
See Chapter 6 to Exit.

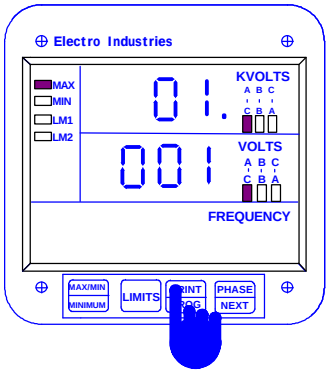
3.2 GROUP *0*, FUNCTION *1* - THE METER ADDRESS

METER ADDRESS: Identifies the meter when communicating with a computer system or an RS485 bus. When numerous meters are at one site, it is essential that each meter have its own address.

⇨To change the **METER ADDRESS**, follow these steps:

NOTE: PRESS ***MAX/MIN/LIMITS***, AT ANY TIME, TO CANCEL BEFORE STORING THE LAST DIGIT OR SWITCH.





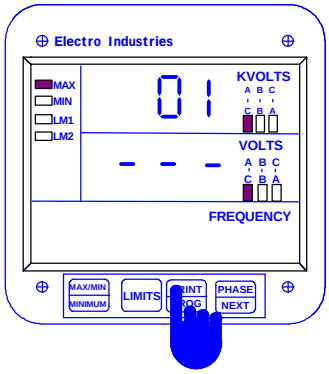
Step 1:
a. Enter Group Level of Programming Mode, (see Chp. 2).

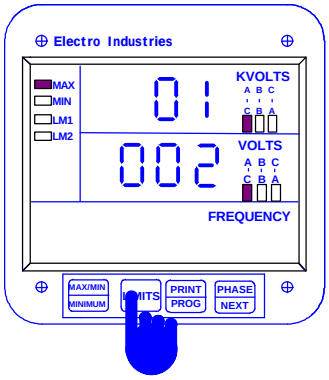
b. ***0.*** appears in upper display.

c. Press ***PRINT*** to activate the GROUP.

⇨***01.*** appears in upper display.

⇨Middle display indicates the current Meter Address.





Step 2:
a. Press ***PRINT*** to activate Data Entry Sequence.

⇨Three dashes appear in Middle display.

b. Press ***LIMITS*** for desired number.
- Press ***LIMITS*** once and the blank signifies a zero.
- Press ***LIMITS*** twice and ***1*** appears.

c. Press ***PRINT*** to store.

⇨Repeat this procedure until new Address is entered.

⇨When complete, lower display indicates new Address.

See Chapter 6 to Exit.

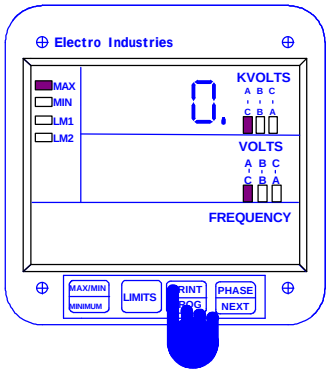
3.3 GROUP *0*, FUNCTION *2* - COMMUNICATION BAUD RATE

BAUD RATE: Speed at which data is transmitted between device and remote computer. The rate programmed into the meter must match the rate used by the remote polling device.

Valid Baud Rates are 1200, 2400, and 4800. When entering a baud rate, the last zero is omitted. Therefore, three digits and a leading zero (or blank) must be entered. Example: to enter a baud rate of 2400, enter 0240.

⇨To change the **COMMUNICATION BAUD RATE**, follow these steps:

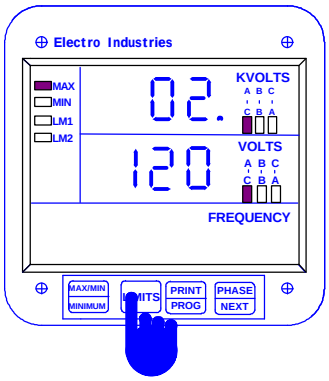
NOTE: PRESS ***MAX/MIN/LIMITS***, AT ANY TIME, TO CANCEL BEFORE STORING THE LAST DIGIT OR SWITCH.



Step 1:
a. Enter Group Level of Programming Mode (see Chp. 2).

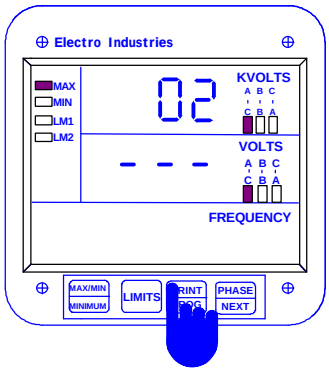
b. Press ***MAX/MIN*** until ***0.*** appears in upper display.

c. Press ***PRINT*** to activate the Group.



⇨***02.*** appears in upper display.

⇨Lower display indicates current Baud Rate.

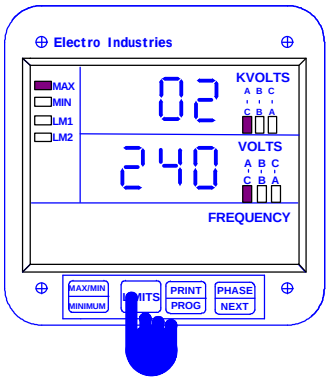


Step 2:
a. Press ***PRINT*** to begin Data Entry Sequence.

b. Three dashes appear in lower display.

c. Press ***LIMIT*** to select.

d. Press ***PRINT*** to store and move to see next digit.



⇨Repeat this procedure until new Communication Baud Rate is entered.

⇨When complete, lower display indicates new Baud Rate.

See Chapter 6 to Exit.

3.4 GROUP *0*, FUNCTION *3* - SYSTEM CONFIGURATION

The System Configuration Function is used to set basic meter operational parameters. (This Function utilizes Switch PACKS).

FUNCTION *3* contains six Switch PACKS, *0* - *5*. Each PACK contains three individual UP/DOWN (toggle) switches.

- Toggling the segment ***UP*** and ***DOWN***, toggles the switch ***ON*** and ***OFF*** respectively, or chooses between two options.
- The meter displays one Switch PACK at a time.

⇨Press ***PRINT/PROG*** to scroll from PACK to PACK.

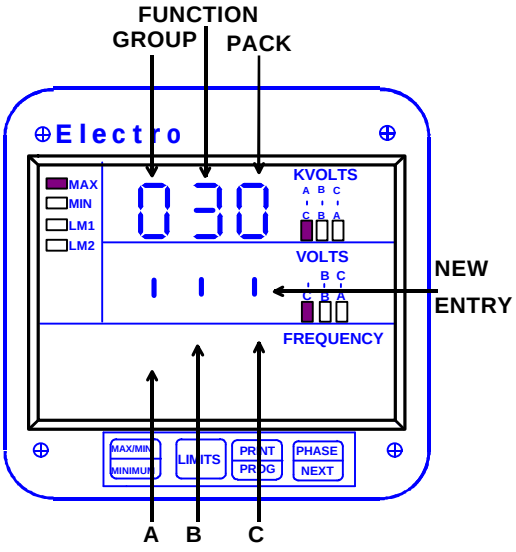


TABLE 3-2: SWITCH FEATURES

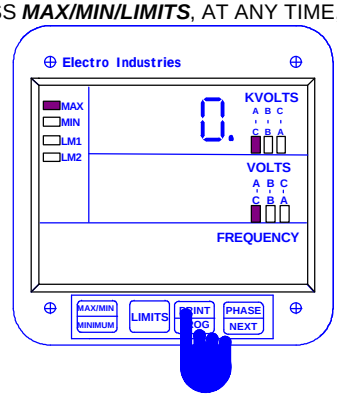
PACK	SWITCH	FEATURE	SEGMENT POSITION
0	A	Reserved	-
	B	Reserved	-
	C	Reserved	-
1	A	Reserved	-
	B	Blank non-significant leading zero(s)	UP ⇨ Enable DOWN ⇨ Disable
	C	Reset Protection (See User's Installation & Operation Section)	UP ⇨ Enable DOWN ⇨ Disable
2	A	Reserved	-
	B	* Three Phase Connections	UP ⇨ Open Delta DOWN ⇨ Wye
	C	Reserved	-
3	A	Reserved	-
	B	Reserved	-
	C	Reserved	-
4	A	Relay Control I	UP ⇨ Alarm Only DOWN ⇨ Computer Control & Alarm
	B	Relay Control II	UP ⇨ Alarm Only DOWN ⇨ Computer Control & Alarm
	C	-	UP ⇨ Comm. DOWN ⇨ Disable Comm. and Print
5	A	-	UP ⇨ Print DOWN ⇨ Disable Print

***** The DMVA 100-PS will only display Phase to Phase Measurements.

3.5 GROUP 0, FUNCTION 3 - PROGRAMMING PROCEDURE

⇨To change the **SYSTEM CONFIGURATION SWITCH** settings, follow these steps:

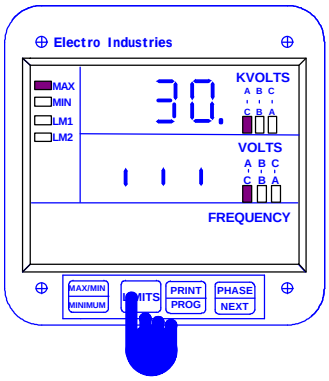
NOTE: PRESS ***MAX/MIN/LIMITS***, AT ANY TIME, BEFORE STORING THE LAST DIGIT OR SWITCH.



Step 1:
a. Enter Group Level of Programming Mode, (see Chapter 2).

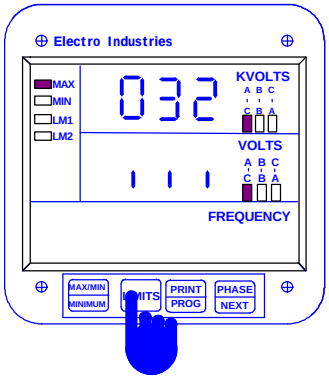
b. Press ***MAX/MIN*** until ***0.*** appears in upper display.

c. Press ***VPRINTOLTS*** to activate the Group.



⇨***03.0*** appears in upper display.

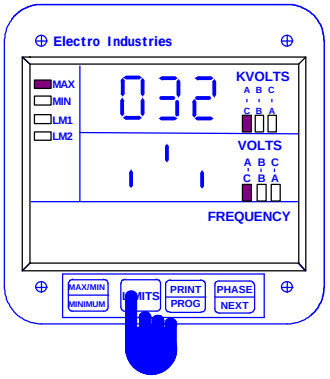
⇨Lower display indicates current PACK 0 Switch Settings.



Step 2:
a. Press ***LIMIT*** until desired PACK appears.

b. Press ***PRINT*** to begin Data Entry Sequence.

⇨Three dashes appear in lower display.



Step 3:
a. Press ***LIMITS*** to toggle the segments UP or DOWN for desired setting.

b. Press ***PRINT*** to store and move to the next switch.

See Chapter 6 to Exit.

CHAPTER 4
PROGRAMMING GROUP 1

4.1 SCALE SELECTIONS AND FULL SCALE SETTINGS

Programming GROUP 1 functions provide a selection of Full Scale Settings to accommodate the different CTs and PTs. The decimal point may be positioned for maximum resolution. The user can perform Scale Selection in each function. The site technician has a choice of Full Scale selection between volts and kilovolts, and amps and kiloamps.

NOTE: DUE TO THE RESOLUTION CAPABILITY, READINGS OVER 2000 COUNTS RESULT IN A LESS STABLE MEASUREMENT.

⇨Tables **4-0** and **4-1** contain Full Scale settings for typical voltages and currents (PT and CT arrangements):

TABLE 4-0

INPUT VOLTAGE	PT RATIO	FULL SCALE
120	100/1	12.00KV
120	120/1	14.40KV

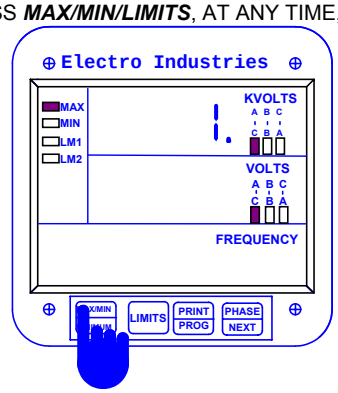
TABLE 4-1: GROUP 1 PROGRAMMING FORMAT

FUNCTION NUMBER	FUNCTION
0.	Full Scale Selection for Primary Voltage
1.	Full Scale Selection for Secondary voltage
E.	Exit Programming GROUP 1

4.2 GROUP 1, FUNCTIONS *0-1*: FULL SCALE SETTINGS, VOLT & AMP CHANNELS, VOLT & AMP DECIMAL PLACEMENT

⇨To change the **VOLT OR AMP FULL SCALE** settings (Function *0* and *1*, respectively), follow these steps:

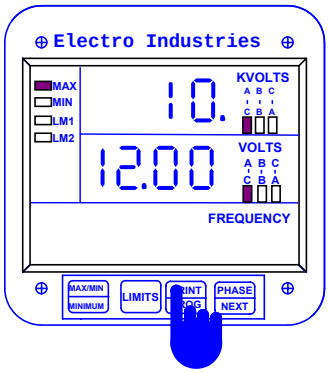
NOTE: PRESS ***MAX/MIN/LIMITS***, AT ANY TIME, TO CANCEL BEFORE STORING THE LAST DIGIT OR SWITCH.



Step 1:
a. Enter Group Level of Programming Mode, (see Chp. 2).

b. Press ***MAX/MIN*** until ***1.*** appears in upper display.

c. Press ***PRINT*** to activate the Group.



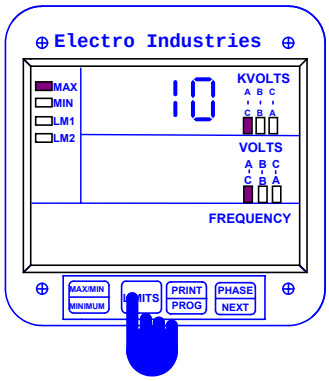
Step 2:
⇨***10.*** appears in upper display.

⇨Lower display indicates Full Scale setting.

⇨A segment appears in upper display.

⇨UP signifies - *Kilovolts*.
⇨DOWN signifies - *Volts*.

a. Press ***PRINT*** to begin Data Entry Sequence.

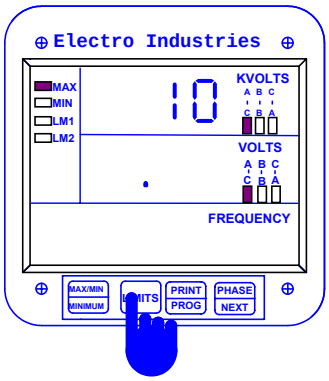


ENTERING THE FULL SCALE FACTOR

Step 3:
⇨A dash appears in lower display.

a. Press ***LIMITS*** to move the segment UP or DOWN.

b. Press ***PRINT*** to store.

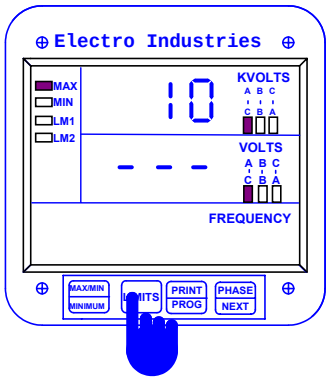


DECIMAL POINT SELECTION

Step 4:
a. Press ***LIMITS*** to begin decimal placement.

b. Press ***PRINTS*** to store

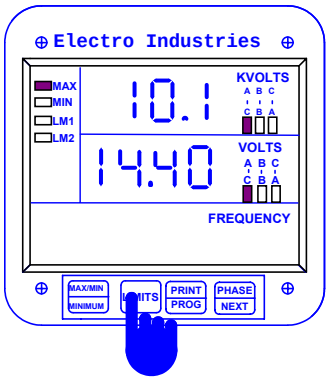
⇨**NOTE**: THE DECIMAL POINT FOR 1999. DOES NOT APPEAR ON THE DISPLAY.



Step 5 :
⇨Three dashes appear in lower display.

a. Press ***LIMITS*** for desired number.
- Press ***LIMTS*** once and the blank signifies a zero.
- Press ***LIMITS*** twice and ***1*** appears.

b. Press ***PRINT*** to store and move to the next digit.



⇨Repeat this procedure until desired value is entered

⇨When complete, lower display indicates new Full Scale setting.

See Chapter 6 to Exit.

CHAPTER 5

PROGRAMMING GROUP 2: METER CALIBRATION

5.1 STANDARD CALIBRATION

WARNING - READ THIS SECTION CAREFULLY BEFORE PROCEEDING

- Calibration does not need to be accomplished to change CT or PT ratios. (See GROUP 1)
- Meter calibration cannot be performed if the meter is installed for service. The sensing must be connected to a power supply with variable voltage and separate current outputs.
- **The calibration procedure requires highly accurate and stable input signals**. Incorrect readings result from improper calibration procedures. If unsure, return unit to the factory for calibration.
- **BEFORE** calibrating any channel, make note of its Full Scale Setting (see Chp. 4). Set the Full Scale in accordance with Table **5-1** for calibration. Restore original Full Scale Setting when calibration is completed.
- The first function in GROUP 2 (STD.CORR) is ***NOT*** to be changed by the user. Please make note of the value here (□□□□) before using any other function in this Group. If the STD.CORR value is inadvertently lost or changed, contact the factory for assistance.

All sensitive electronic measuring devices *drift* slightly over time, requiring periodic calibration. We recommend returning the meter to the factory on a yearly basis.

TABLE 5-0: GROUP 2 PROGRAMMING FORMAT

FUNCTION NUMBER	FUNCTION
P.	Standard Correction. Factory Procedure only.
0.	High End Calibration, VOLTS AN
1.	High End Calibration, VOLTS BN
2.	High End Calibration, VOLTS CN

The Full Scale and Calibration values should be equal during the calibration procedure. The meter may be rescaled without calibrating by changing the full scale in GROUP 1, FUNCTION *0* or *1*. (See Table **5-1**)

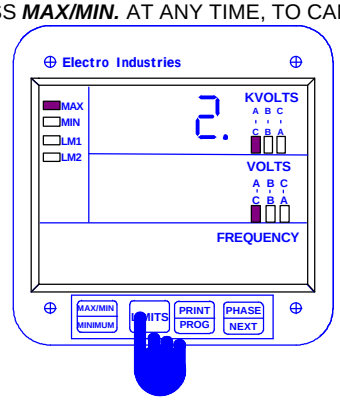
TABLE 5-1: SOURCE, FULL SCALE AND VALUE SETTINGS FOR CALIBRATION

CALIBRATION TYPE/ RANGES	CALIB. SOURCE NECESSARY	FULL SCALE SETTING	CALIBRATION VALUE
VOLTS 120	120V	14.40	14.40

5.2 GROUP 2, FUNCTIONS 0-8: HIGH END CALIBRATION OF VOLTAGE CHANNELS, HIGH & LOW END CALIBRATION OF AMPERAGE CHANNELS

⇨To change the **CALIBRATION**, follow these steps:

NOTE: PRESS ***MAX/MIN.*** AT ANY TIME, TO CANCEL BEFORE STORING THE LAST DIGIT OR SWITCH.



Step 1:
a. Enter Group Level of Programming Mode, (see Chp. 2).

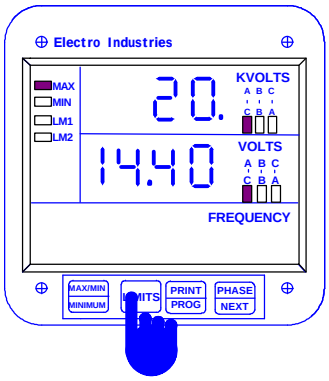
b. Press ***MAX/MIN/LIMITS*** until ***2.*** appears in upper display.

c. Press ***PRINT*** activate the Group.

⇨A one digit password is required to continue.

d. Press ***LIMITS*** until ***5*** appears.

e. Press ***PRINT*** to select.

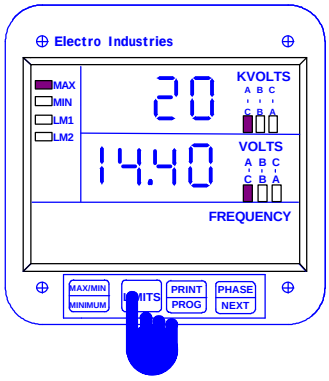


Step 2:
⇨Refer to Table **5-0** for Function Number that corresponds to channel requiring calibration.

a. Press ***PRINT*** (to calibrate VOLTS AN) until ***20.*** appears in upper display.

The correct Value is 981

⇨*(2P is pre-calibrated. This is a factory set value and should not be altered).*



Step 3:
⇨Apply the calibration to the appropriate channel.

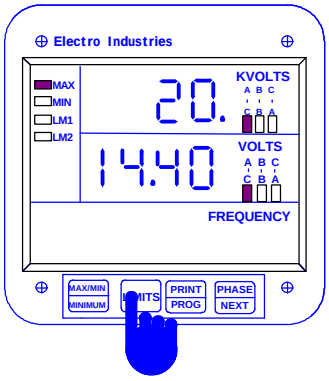
a. Press ***PRINT*** to activate calibration.

b. Press ***LIMITS*** for desired number.

Press ***LIMITS*** once and the blank signifies a zero.
Press ***LIMITS*** twice and ***1*** appears.

c. Press ***PRINT*** to store and move to the next digit

⇨When complete, lower display indicates the calibrated reading after **10-15 seconds**.



Step 4:
a. Press ***MAX/MIN*** to exit calibration sequence.

⇨Proceed to calibrate another function, or exit.

See Chapter 6 to Exit.

❍ **REPEAT THIS PROCEDURE FOR FUNCTIONS 1 AND 2.**

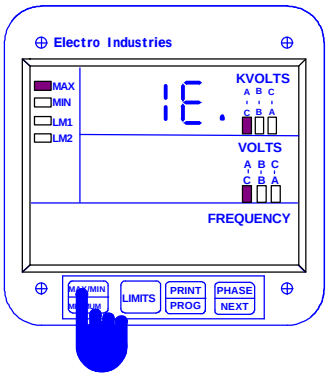
CHAPTER 6

EXITING THE PROGRAMMING MODE

NOTE: STEPS TO EXIT THE PROGRAMMING MODE VARIES AS THE PROGRAMMING STAGE VARY.

Exiting the Programming Mode is **ALWAYS** necessary to store any new changes and to calculate a new checksum. Failure to exit results in a checksum error. The display blanks and the max LED intermittently flashes.

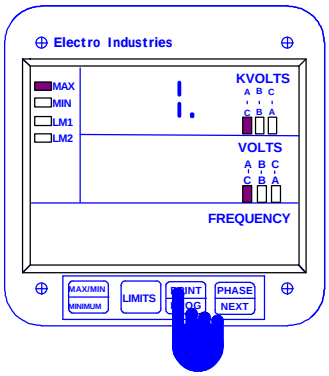
IF YOU ARE LOCATED AT: FUNCTION LEVEL - begin at **Step 1**
GROUP LEVEL - begin at **Step 2**



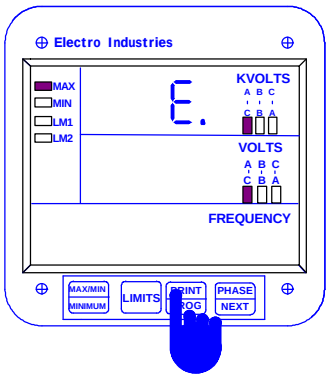
EXITING FROM FUNCTION LEVEL

Step 1:
a. Press ***MAX/MIN*** until the Group number in upper display is followed by ***E.***

⇨The DMVA 100 re-turns to Function Level.



Step 1a:
a. Press ***PRINT*** to exit from Function Level to Group Level.



EXITING FROM GROUP LEVEL

Step 2:
a. Press ***MAX/MIN*** until ***E.*** appears in upper display.

b. Press ***PRINT*** to exit entirely from Programming Mode.

YOU HAVE EXITED THE PROGRAMMING MODE.

AFTER A MOMENT, THE METER RETURNS TO THE OPERATING MODE.