



SPECIFICATIONS

DISPLAY

Liquid crystal display with backlight
4 lines, 4 digits per line to show electrical Parameters
5th line, 8 digits to show energy
Bar graph for current indication

LCD INDICATIONS

INT - Integration of energy
PRG - Unit is in configuration menu
- Communication in progress
MAX DMD - Maximum & Minimum Demand Power

WIRING INPUT

3 Ø - 4 wire, 3 Ø - 3 wire, 2 Ø - 3 wire, &
1 Ø - 2 wire system

RATED INPUT VOLTAGE

11 to 300V AC (L-N) ; 19 to 519V AC (L-L)

FREQUENCY RANGE

45-65 Hz

RATED INPUT CURRENT

Nominal 5AAC (Min-11mA, Max-6A)

CT PRIMARY

1A / 5A to 10,000A (Programmable for any Value)

Note: 1A to 10,000A if CT secondary is 1 else CT primary is 5A to 10,000A

CT SECONDARY

1A or 5A (programmable)

PT PRIMARY

100V to 500kV (Programmable for any value)

PT SECONDARY

100 to 500V AC (L-L)(Programmable for any value)

Display update time

1 sec for all parameters

Display Scrolling

Automatic / Manual

AUXILIARY SUPPLY RANGE

MITIM2 : 85 to 270V AC, 50/60Hz

BURDEN : 0.5 VA@5A per phase

TEMPERATURE: Operating: 0 to 50°C

Storage : -20 to 75°C

HUMIDITY : 85% non-condensing

MOUNTING : Panel mounting

WEIGHT : 362gr

OUTPUT

Pulse Output: Voltage range : External 24VDC max.

Current capacity : 100 mA max

Pulse Width : 100 ms $\pm$ 50 ms.

SERIAL COMMUNICATION

Interface standard & protocol	RS485 & MODBUS RTU
Communication address	1 to 255
Transmission mode	Half duplex
Data types	Float and Integer
Transmission distance	500m maximum
Transmission speed	300, 600, 1200, 2400, 4800, 9600, 19200 (in bps)
Parity	None, Odd, Even
Stop bits	1 or 2
Response time	100 ms (max and independent of baud rate)

RESOLUTION

PT Ratio x CT Ratio	kWh/ kVAh/ kVArh	Pulse
<15	0.01K	0.01K
<150	0.1K	0.1K
<1500	1K	1K
<15000	0.01M	0.01M
<150000	0.1M	0.1M
≥ 1500000	1M	1M

NOTE:

- 1) For Voltage, Current, Power, resolution is automatically adjusted
- 2) For power factor, resolution is 0.001
- 3) INT blinks after every 5 seconds, if load is connected on any one of 3 phase

ACCURACY :

Measurement	Accuracy
Voltage V_{L-N}	$\pm 0.5\%$ of Full scale
Voltage V_{L-L}	$\pm 0.5\%$ of Full scale
Current	$\pm 0.5\%$ of Full scale
Frequency	$\pm 0.1\%$ For Voltage >20V L-N, For Voltage >35V L-L
Active Power	Class 1
Apparent power	Class 1
Reactive Power	Class 1
Power factor	± 0.01
Active energy	Class 1
Reactive energy	Class 1
Apparent energy	Class 1
MAX / MIN Active Power	Class 1
MAX / MIN Reactive Power	Class 1
MAX Apparent Power	Class 1

SAFETY PRECAUTIONS

All safety related codifications, symbols and instructions that appear in this operating manual or on the equipment must be strictly followed to ensure the safety of the operating personnel as well as the instrument.
If the equipment is not handled in a manner specified by the manufacturer it might impair the protection provided by the equipment.

CAUTION: Read complete instructions prior to installation and operation of the unit.

CAUTION: Risk of electric shock.

WIRING GUIDELINES

WARNING:

1. To prevent the risk of electric shock power supply to the equipment must be kept OFF while doing the wiring arrangement.
2. Wiring shall be done strictly according to the terminal layout. Confirm that all connections are correct.
3. Use lugged terminals.
4. To eliminate electromagnetic interference use of wires with adequate ratings and twists of the same in equal size shall be made.
5. Cable used for connection to power source, must have a cross section of 1.5mm². These wires shall have current carrying capacity of 6A.

MAINTENANCE

1. The equipment should be cleaned regularly to avoid blockage of ventilating parts.
2. Clean the equipment with a clean soft cloth.
Do not use Isopropyl alcohol or any other cleaning agent.

INSTALLATION GUIDELINES

CAUTION:

1. This equipment, being built-in-type, normally becomes a part of main control panel and in such case the terminals do not remain accessible to the end user after installation and internal wiring.
2. Conductors must not come in contact with the internal circuitry of the equipment or else it may lead to a safety hazard that may in turn endanger life or cause electrical shock to the operator.
3. Circuit breaker or mains switch must be installed between power source and supply terminals to facilitate power 'ON' or 'OFF' function. However this switch or breaker must be installed in a convenient position normally accessible to the operator.
4. Before disconnecting the secondary of the external current transformer from the equipment, make sure that the current transformer is short circuited to avoid risk of electrical shock and injury.

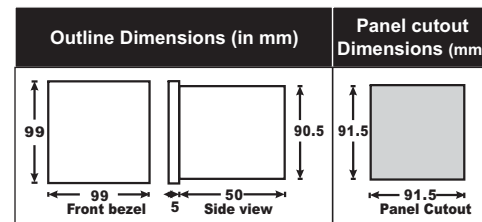
CAUTION:

1. The equipment shall not be installed in environmental conditions other than those mentioned in this manual.
2. The equipment does not have a built-in-type fuse.
Installation of external fuse of rating 275VAC/1Amp for electrical circuitry is highly recommended.

MECHANICAL INSTALLATION

For installing the meter

1. Prepare the panel cutout with proper dimensions as shown below :



2. Push the meter into the panel cutout. Secure the meter in its place by pushing the clamp on the rear side. The screws of the panel of the clamp must be in the farthest forward slot.
3. For proper sealing, tighten the screws evenly with required torque.

CAUTION:

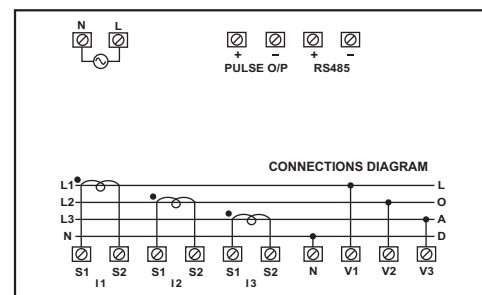
The equipment in its installed state must not come in close proximity to any heating sources, caustic vapors, oils, steam, or other unwanted process by-products.

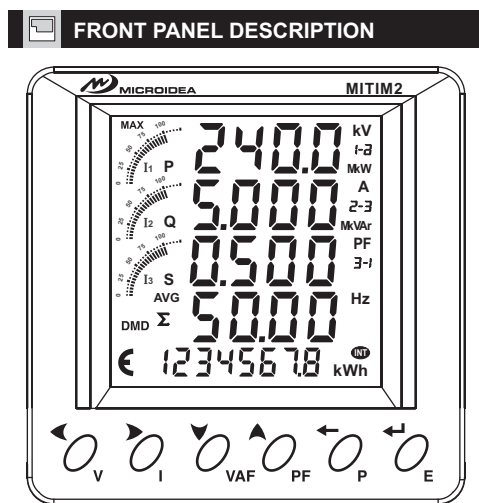
EMC Guidelines:

1. Use proper input power cables with shortest connections and twisted type.
2. Layout of connecting cables shall be away from any internal EMI source.

TERMINAL CONNECTIONS

MITIM2





ONLINE PAGE DESCRIPTION

There are 6 dedicated keys labelled as V, I, VAF, PF, P, E. Use these 6 keys to read meter parameters. Simply press these keys to read the parameters.

KEY	ONLINE PAGE DESCRIPTION
Press "V"	The first screen: Displays Line to Neutral Voltage of three phase & average Line to Neutral Voltage. The second screen: Displays Line to Line Voltage of three phase & average line to line Voltage. Note: For 3 Ø 3 wire system, only the second screen will be available.
Press "I"	The first screen: Displays phase Current of three phase & average phase Current.
Press "VAF"	The first screen: Displays Voltage, Current, Power factor of first phase & Frequency. The second Screen: Displays Voltage, Current, Power factor of second phase & Frequency. The third Screen: Displays Voltage, Current, Power factor of third phase & frequency. The fourth Screen: Displays Average, Value of Voltage, Current, & Power factor of three phase & Frequency.
Press "PF"	The first screen: Displays Power factor of three phase & average Power factor. Note: For 3 Ø 3 wire system, only average Power factor will be available on this screen.

KEY	ONLINE PAGE DESCRIPTION
Press "P"	The first screen: Displays Active power of three phase & total Active Power. The second screen: Displays Reactive Power of three phase & total Reactive Power. The third screen: Displays Apparent Power of three phase & total Apparent Power. The fourth screen: Displays Active, Reactive, Apparent power & Power factor of first phase. The fifth screen: Displays Active, Reactive, Apparent power & Power factor of second phase. The sixth screen: Displays Active, Reactive, Apparent power & Power factor of third phase. The seventh screen: Displays total Active, Reactive, Apparent power & average Power factor of three phase. The eighth screen: Displays maximum Active power demand, Reactive power demand & Apparent power demand. The ninth screen: Displays minimum Active power demand & Reactive power demand. Note: For 3 Ø 3 wire system, only seventh, eighth and ninth screen will be available.
Press "E"	The first screen: Displays Active energy of three phase. The second screen: Displays Apparent energy of three phase. The third screen: Displays Reactive energy of three phase.

AUTOMATIC / MANUAL MODE DESCRIPTION

Press E () button for 3 seconds to toggle between Automatic & Manual mode.

Note: By default unit operates in automatic mode. In automatic mode online pages scroll automatically at the rate of 5 seconds per page. In automatic mode when any key is pressed, unit temporarily switches to manual mode and the appropriate page is displayed, also if no key is pressed for 5 sec, unit resumes automatic mode.

CONFIGURATION

There are 6 dedicated keys with symbols marked as , , , , , use these 6 keys to enter into configuration menu / change setting.

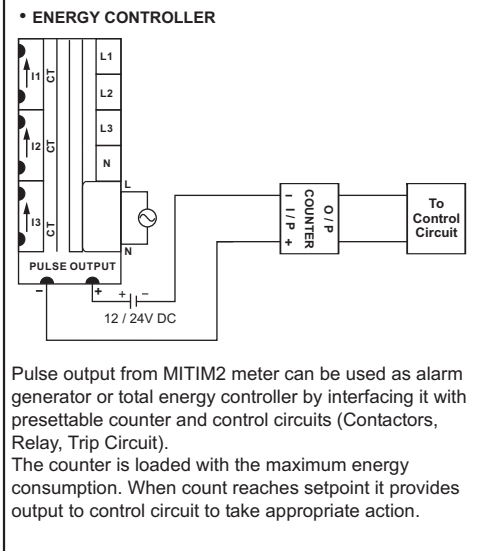
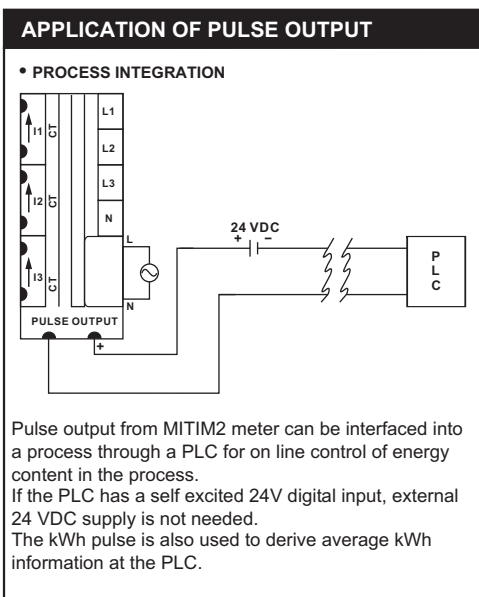
Note: The settings should be done by a professional, after going through this users manual and after having understood the application situation.

For the configuration setting mode:

- Use + keys for 3 sec to enter or exit from the configuration menu.
- Use or keys to move cursor left or right by one digit each time.
- Use or keys for increasing or decreasing parameters value.
- Use key to go back to previous page.
- Use key to save the setting and move on to next page.

Config page.	Function	Range or Selection	Factory Setting
	Password	0000 to 9999	1000
1	Change Password	No / Yes	No
1.1	New Password	0000 to 9999	1000
2	Network Selection	3P3W and 3P4W	3P4W
3	CT Secondary	1A or 5A	5
4	CT Primary	1A, 5A to 10,000A (10.0 kA)	5
5	PT Secondary	100V to 500V	350
6	PT primary	100V to 500kV	350
7	Slave Id	1 to 255	1
8	Baud Rate	300, 600, 1200, 2400, 4800, 9600 & 19200	9600
9	Parity	None, Even, Odd	None
10	Stop Bit	1 or 2	1
11	Back Light	0 to 7200 sec.	0000
12	Demand interval method	Sliding / Fixed	Sliding
13	Demand interval duration	1 to 30	15
14	Demand interval length	1 to 30 min	1
15	Max Page Auto	1 to 17	17
16	Change Page Sequence	No / Yes	No
16.01	Page sequence 1	_____	1
16.02	Page sequence 2	_____	2
16.03	Page sequence 3	_____	3
16.04	Page sequence 4	_____	4
16.05	Page sequence 5	_____	5
16.06	Page sequence 6	_____	6
16.07	Page sequence 7	_____	7
16.08	Page sequence 8	_____	8
16.09	Page sequence 9	_____	9
16.10	Page sequence 10	_____	10
16.11	Page sequence 11	_____	11
16.12	Page sequence 12	_____	12
16.13	Page sequence 13	_____	13
16.14	Page sequence 14	_____	14
16.15	Page sequence 15	_____	15
16.16	Page sequence 16	_____	16
16.17	Page sequence 17	_____	17
17	Factory Default	No / Yes	NO
18	Reset Energy & Max Demand	No / Yes	NO
• 18.1	Password	0001 To 9999	1001
18.01	Reset Active Energy	No / Yes	NO
18.02	Reset Reactive Energy	No / Yes	NO
18.03	Reset Apparent Energy	No / Yes	NO
18.04	Reset Max Active Power	No / Yes	NO
18.05	Reset Min Active Power	No / Yes	NO
18.06	Reset Max Reactive Power	No / Yes	NO
18.07	Reset Min Reactive Power	No / Yes	NO
18.08	Reset Max Apparent Power	No / Yes	NO

• For resetting energy parameters user will be prompted the password. If correct password is entered, the user will be able to reset all energy parameters. This password will be value which will be greater than the configuration password by 1.



Pulse output from MITIM2 meter can be used as alarm generator or total energy controller by interfacing it with presettable counter and control circuits (Contactors, Relay, Trip Circuit). The counter is loaded with the maximum energy consumption. When count reaches setpoint it provides output to control circuit to take appropriate action.

MODBUS REGISTER ADDRESSES LIST

MODBUS register addresses list					
Readable parameters:					
Address	Hex Address	Parameter	Length (Register)	Data Structure	
30000	0x00	Voltage V1N	2	Float	
30002	0x02	Voltage V2N	2	Float	
30004	0x04	Voltage V3N	2	Float	
30006	0x06	Average Voltage LN	2	Float	
30008	0x08	Voltage V12	2	Float	
30010	0x0A	Voltage V23	2	Float	
30012	0x0C	Voltage V31	2	Float	
30014	0x0E	Average Voltage LL	2	Float	
30016	0x10	Current I1	2	Float	
30018	0x12	Current I2	2	Float	
30020	0x14	Current I3	2	Float	
30022	0x16	Average Current	2	Float	
30024	0x18	kW1	2	Float	
30026	0x1A	kW2	2	Float	
30028	0x1C	kW3	2	Float	
30030	0x1E	kVA1	2	Float	
30032	0x20	kVA2	2	Float	
30034	0x22	kVA3	2	Float	
30036	0x24	kVAr1	2	Float	
30038	0x26	kVAr2	2	Float	
30040	0x28	kVAr3	2	Float	
30042	0x2A	Total kW	2	Float	
30044	0x2C	Total kVA	2	Float	
30046	0x2E	Total kVAr	2	Float	
30048	0x30	PF1	2	Float	
30050	0x32	PF2	2	Float	
30052	0x34	PF3	2	Float	
30054	0x36	Average PF	2	Float	
30056	0x38	Frequency	2	Float	
30058	0x3A	kWh	2	Float	
30060	0x3C	kVAh	2	Float	
30062	0x3E	kVArh	2	Float	
30064	0x40	kW MAX Active Power	2	Float	
30066	0x42	kW MIN Active Power	2	Float	
30068	0x44	kVAr MAX Reactive Power	2	Float	
30070	0x46	kVAr MIN Reactive Power	2	Float	
30072	0x48	kVA MAX Apparent Power	2	Float	

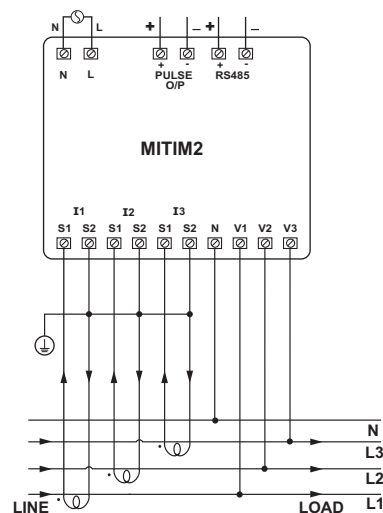
Readable / writable parameters :						
Address	Hex Address	Parameter	Range		Length (Register)	Data Structure
			Min value	Max value		
40000	0x00	Password	0	9998	1	Integer
			Value	Meaning		
40001	0x01	N/W selection	0	3P-4W	1	Integer
			1	3P-3W	1	Integer
			Min value	Max value		
40002	0x02	CT Secondary	1	5	1	Integer
40003	0x03	CT primary (CT Secondary = 5)	5	10000	1	Integer
		CT primary (CT Secondary = 1)	1	10000		
40004	0x04	PT Secondary	100	500	1	Integer
40005	0x05	PT primary	100	500kV	2	Integer
40007	0x07	Slave id	1	255	1	Integer

MODBUS register addresses list continued						
Readable / writable parameters:						
Address	Hex Address	Parameter	Range		Length (Register)	Data Structure
			Min Value	Max Value		
			Value	Meaning		
40008	0x08	Baud rate	0x0000	300	1	Integer
			0x0001	600		
			0x0002	1200		
			0x0003	2400		
			0x0004	4800		
			0x0005	9600		
			0x0006	19200		
			Value	Meaning		
40009	0x09	Parity	0x0000	None	1	Integer
			0x0001	Odd		
			0x0002	Even		
			Value	Meaning	1	Integer
40010	0x0A	Stop bit	0x0000	1		
			0x0001	2		
			Min value	Max value		
40011	0x0B	Backlight OFF	0	7200	1	Integer
40012	0x0C	Factory Default	1	Set to factory setting range	1	Integer
			Value	Meaning		
40013	0x0D	Reset kWh	1	Reset Total Active Energy	1	Integer
40014	0x0E	Reset kVAh	1	Reset Total Apparent Energy	1	Integer
40015	0x0F	Reset kVArh	1	Reset Total Reactive Energy	1	Integer
			Page No	Meaning		
40016	0x10	Auto Mode Pages	1- 17		1	Integer
40017	0x11	Page Address Sequence	1- 17	1- First Page ; 17-Last Page	1	Integer
			Value	Meaning		
40018	0x12	Page Address Sequence	1- 17	1- First Page ; 17-Last Page	1	Integer
40019	0x13	Page Address Sequence	1- 17	1- First Page ; 17-Last Page	1	Integer
40020	0x14	Page Address Sequence	1- 17	1- First Page ; 17-Last Page	1	Integer
40021	0x15	Page Address Sequence	1- 17	1- First Page ; 17-Last Page	1	Integer
40022	0x16	Page Address Sequence	1- 17	1- First Page ; 17-Last Page	1	Integer
40023	0x17	Page Address Sequence	1- 17	1- First Page ; 17-Last Page	1	Integer
40024	0x18	Page Address Sequence	1- 17	1- First Page ; 17-Last Page	1	Integer
40025	0x19	Page Address Sequence	1- 17	1- First Page ; 17-Last Page	1	Integer
40026	0x1A	Page Address Sequence	1- 17	1- First Page ; 17-Last Page	1	Integer
40027	0x1B	Page Address Sequence	1- 17	1- First Page ; 17-Last Page	1	Integer
40028	0x1C	Page Address Sequence	1- 17	1- First Page ; 17-Last Page	1	Integer
40029	0x1D	Page Address Sequence	1- 17	1- First Page ; 17-Last Page	1	Integer
40030	0x1E	Page Address Sequence	1- 17	1- First Page ; 17-Last Page	1	Integer
40031	0x1F	Page Address Sequence	1- 17	1- First Page ; 17-Last Page	1	Integer
40032	0x20	Page Address Sequence	1- 17	1- First Page ; 17-Last Page	1	Integer
40033	0x21	Page Address Sequence	1- 17	1- First Page ; 17-Last Page	1	Integer
			Value	Meaning		
40034	0x22	Demand Interval Method	0X0000	Sliding	1	Integer
			0X0001	Fixed		
40035	0x23	Demand Interval Duration	MIN Value : 1	MAX Value : 30	1	Integer
40036	0x24	Demand Interval Length	MIN Value : 1	MAX Value : 30	1	Integer
40037	0x25	Reset max kW	1	Reset max Active power	1	Integer
40038	0x26	Reset min kW	1	Reset min Active power	1	Integer
40039	0x27	Reset max kVAr	1	Reset max Reactive power	1	Integer
40040	0x28	Reset min kVAr	1	Reset min Reactive power	1	Integer
40041	0x29	Reset max kVA	1	Reset max Apparent power	1	Integer

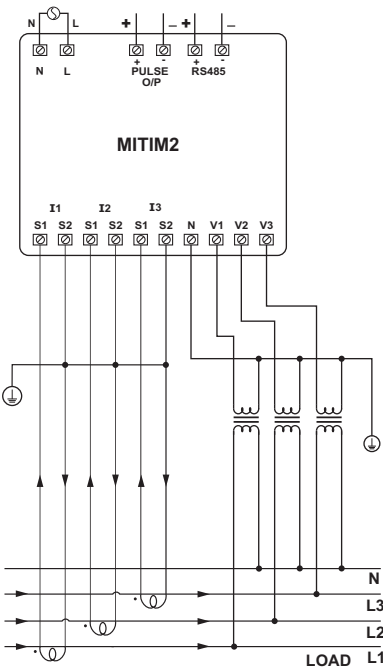
TYPICAL WIRING DIAGRAM

3 PHASE 4-WIRE (COMMONLY USED)

3 Ø - 4 WIRE, 3 CT'S

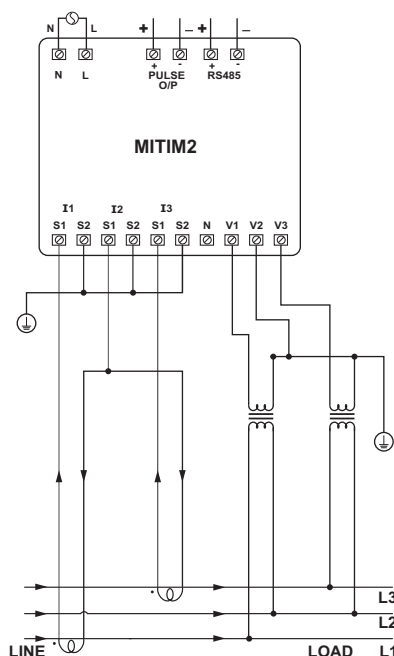


3 Ø - 4 WIRE, 3 CT'S & 3 PT'S

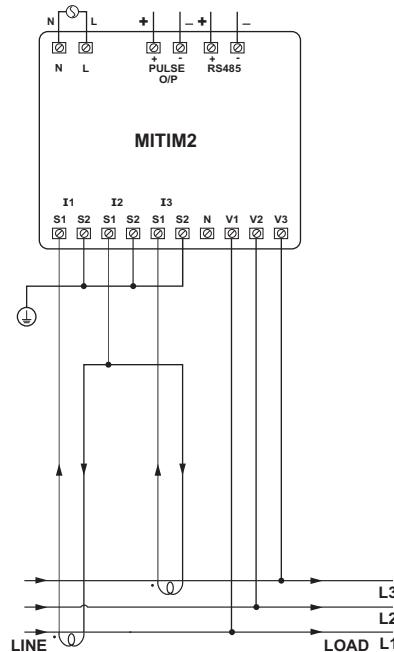


3 PHASE 3-WIRE

3 Ø - 3 WIRE, 2 CT'S & 2 PT'S

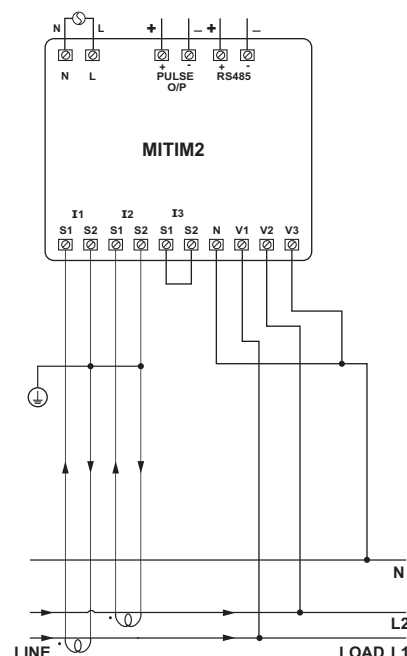


3 Ø - 3 WIRE, 2 CT'S

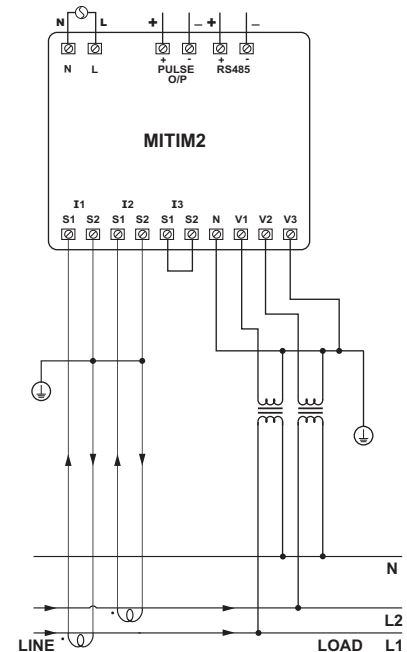


2 PHASE - 3 WIRE

2 Ø - 3 WIRE, 2 CT'S

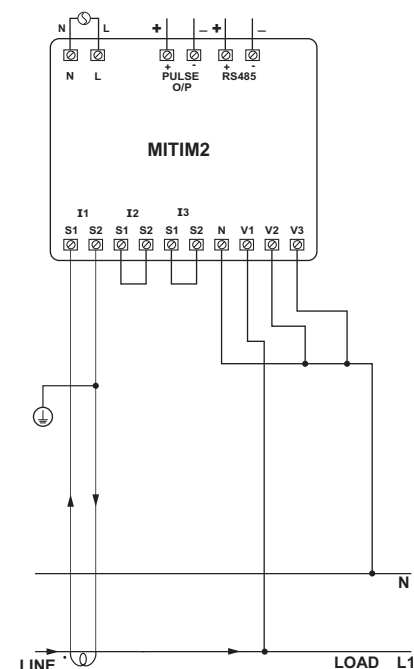


2 Ø - 3 WIRE, 2 CT'S & 2 PT'S

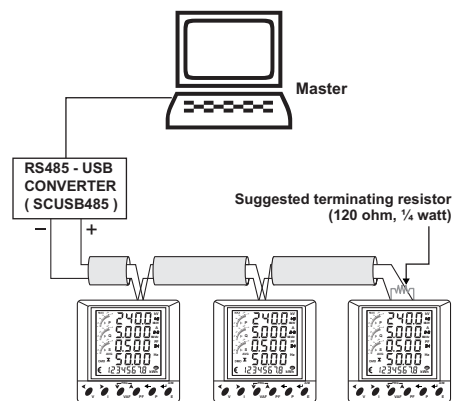


1 PHASE - 2 WIRE

1 Ø - 2 WIRE, 1 CT



CONNECTION DIAGRAM FOR COMMUNICATION



(Specifications subject to change as development is a continuous process).