SATEC
Powerful Solutions

Quick Start Guide

EM132-133

expertmeter™

Mechanical Installation

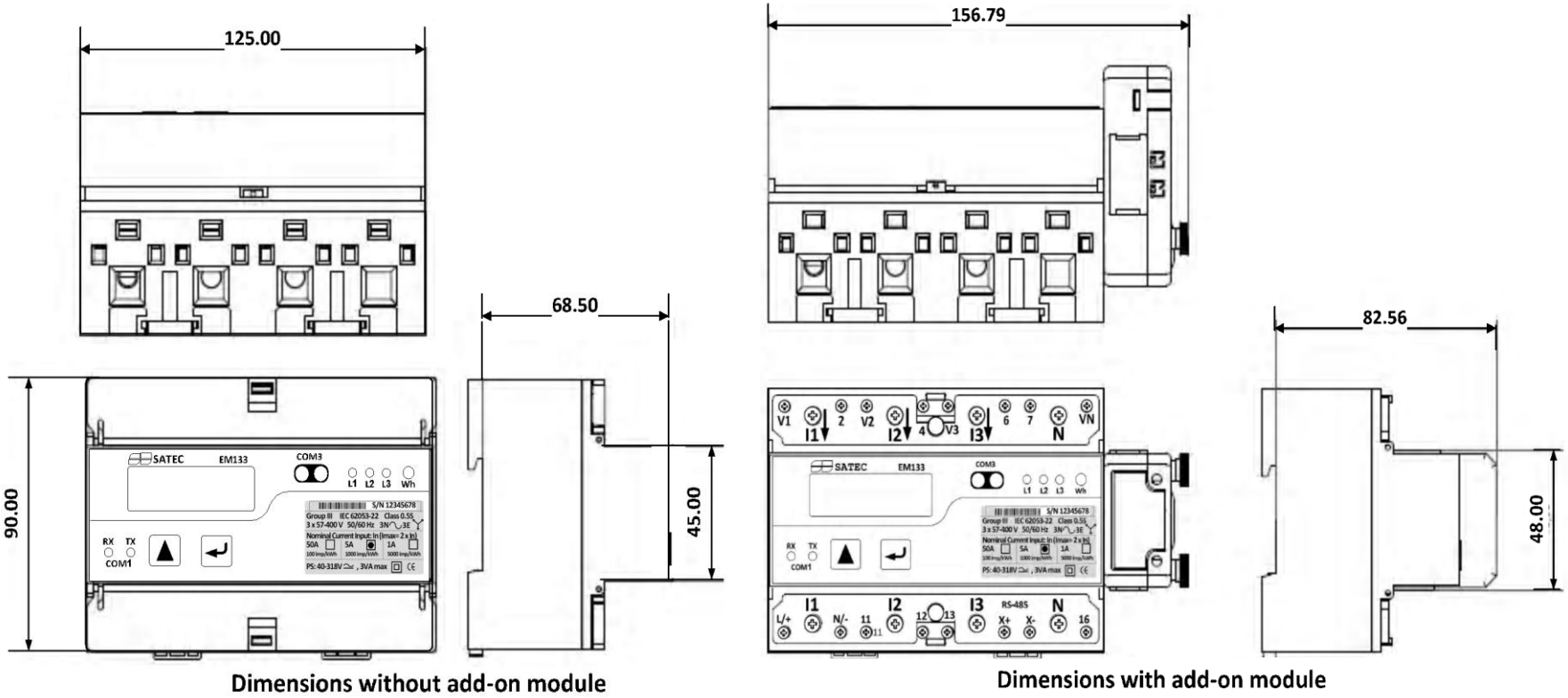


Figure 1: Instrument Dimensions

Mechanical Installation

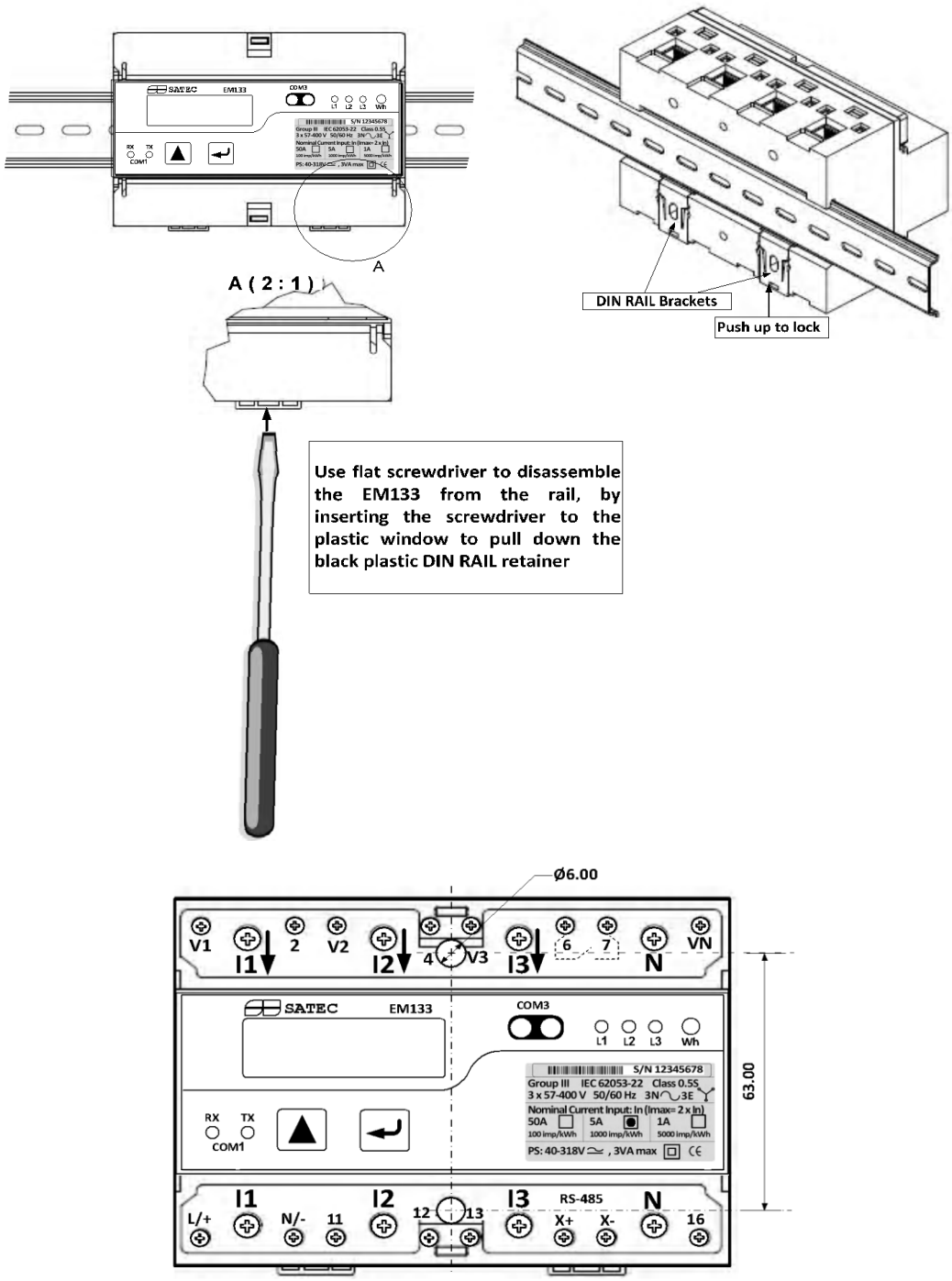


Figure 2: Mounting the EM133 on DIN Rail or on flat surface

IMPORTANT!

Only qualified personnel can perform setup.

All incoming power sources must be turned off during installation. During operation of the Powermeter, hazardous voltages are present on the input terminals. Failure to observe precautions can result in serious or even fatal injury, or damage to equipment.

Please refer to the installation and operation manual for further information.

Typical Electrical Installation

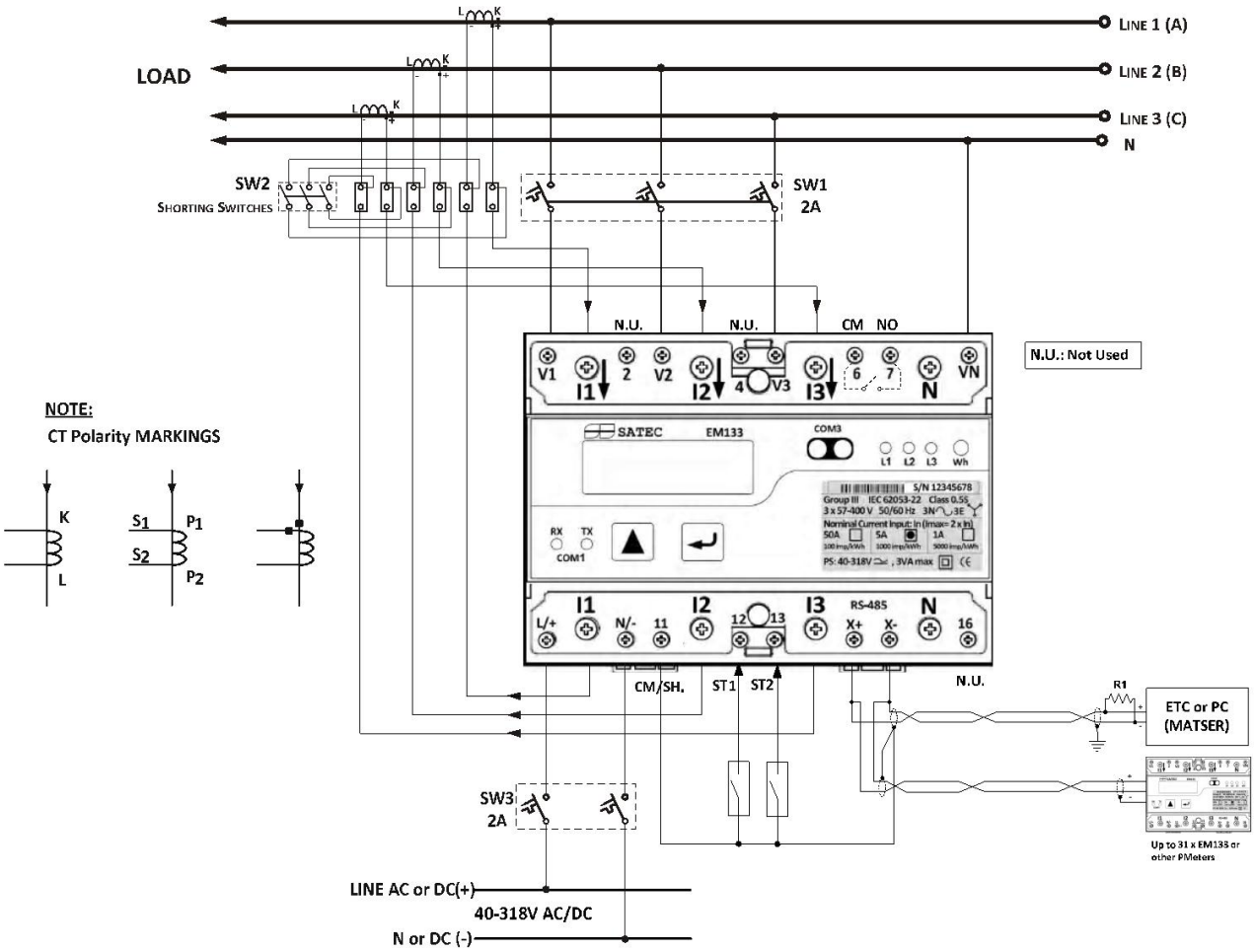


Figure 3:Common Wiring Mode: 4LL3 or 4Ln3

Wiring Configuration	Setup Code
3-wire 2-element Direct connection using 2 CTs	3dir2
4-wire Wye 3-element direct connection using 3 CTs	4Ln3 or 4LL3
4-wire Wye 3-element connection using 3 PTs, 3 CTs	4Ln3 or 4LL3
3-wire 2-element Open Delta connection using 2 PTs, 2 CTs	3OP2
4-wire Wye 2½ -element connection using 2 PTs, 3 CTs	3Ln3 or 3LL3
3-wire 2½ -element Open Delta connection using 2 PTs, 3 CTs	3OP3
4-wire 3-element Delta direct connection using 3 CTs	4Ln3 or 4LL3
3-wire 2½-element Broken Delta connection using 2 PTs, 3 CTs	3bLn3 or 3bLL3

NOTE:

Refer to the Installation and operation manual for the wiring schematics diagrams

Electrical Installation

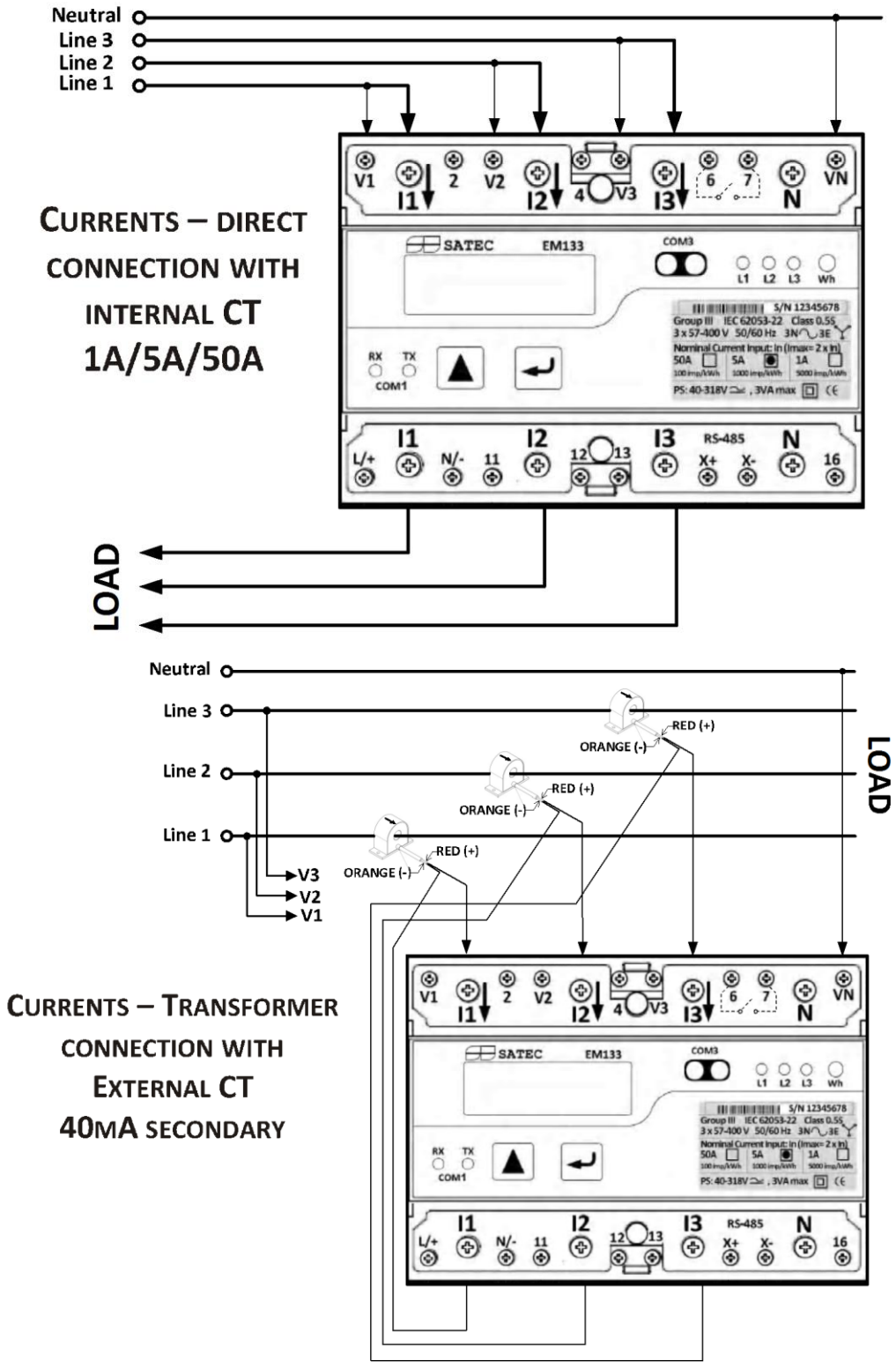


Figure 4: CT Wiring options

MODULE Installation

This section applies to the I/O and Communication modules.

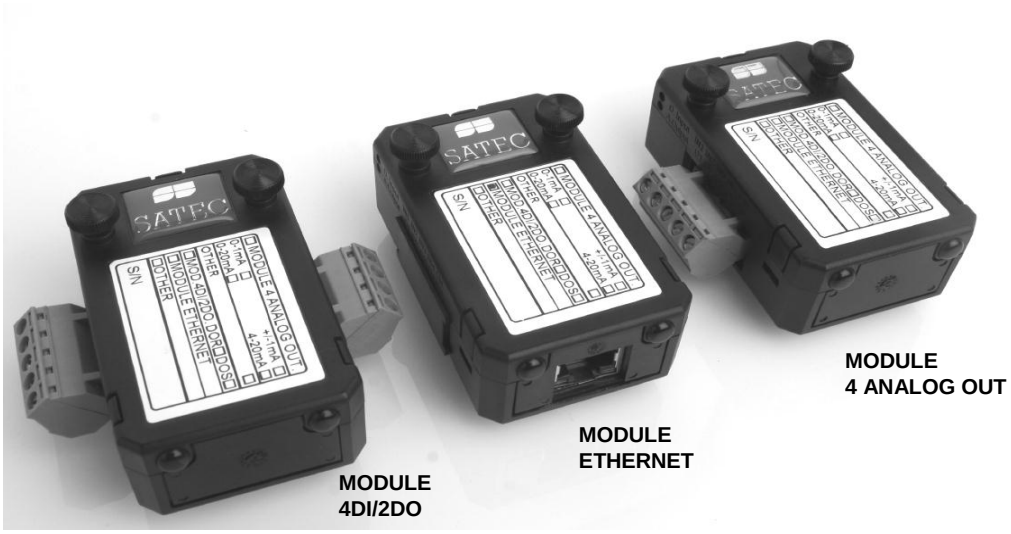


Figure 5: PM130 PLUS modules

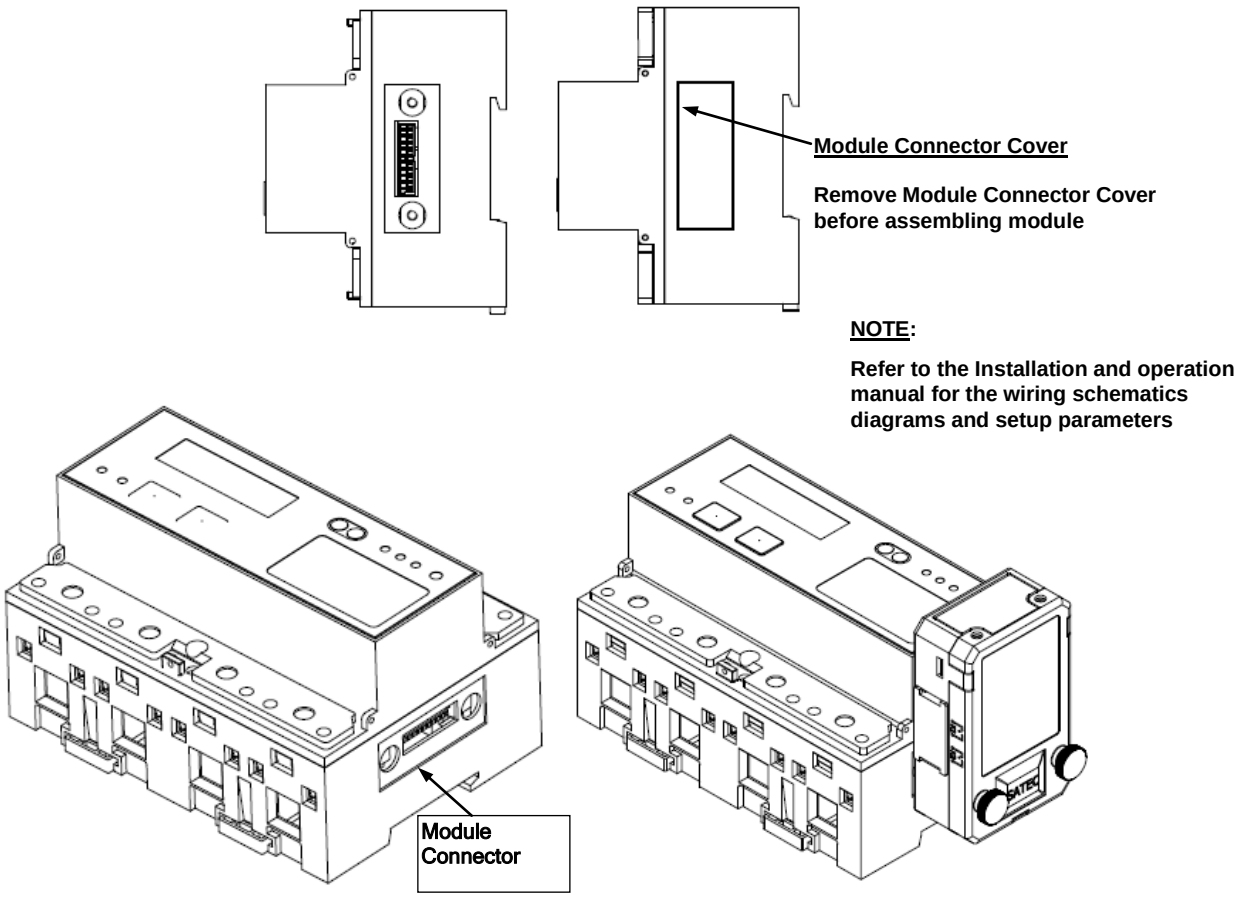


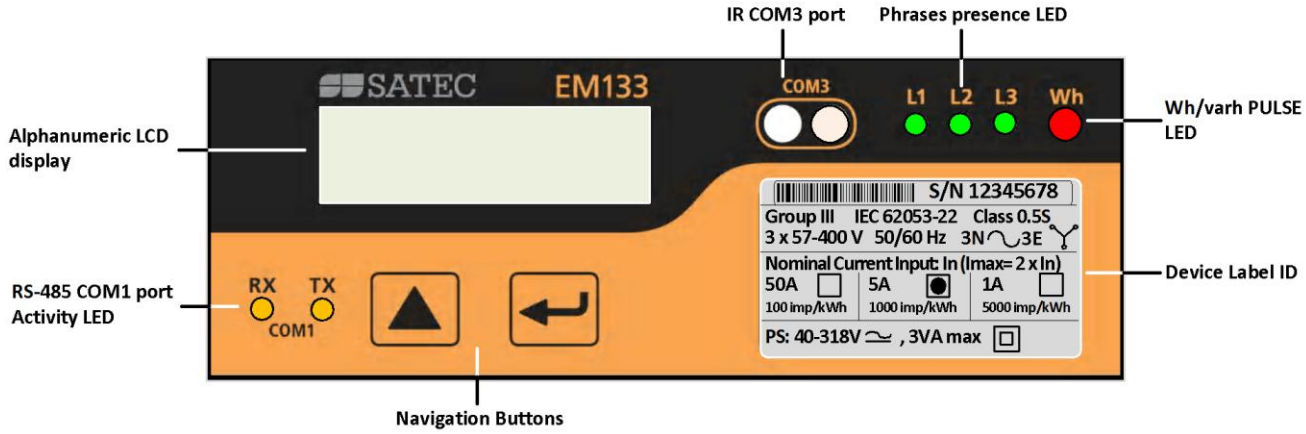
Figure 6: Mounting module

CAUTION!

Before I/O Module installation ensure that all incoming power sources are shut OFF. Failure to observe this practice can result in serious or even fatal injury and damage to equipment.

Basic Setup

All setups can be performed directly from the display panel or via communication ports using PAS communication software, except for Communications and Display setups, which must be performed directly at the instrument panel.

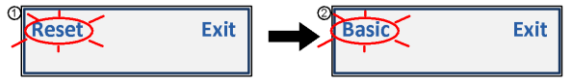


To set the CT Primary current, perform the following steps:

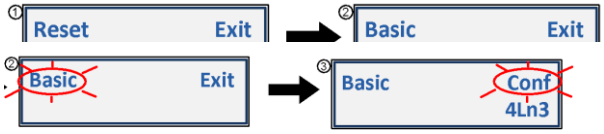
- Press ↵ for 5sec, until password no. blinks:

- Enter Password number using ▲, then press ↵ for 2sec then new display with blinking "Reset"

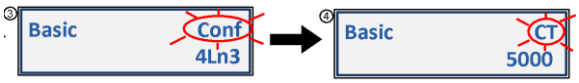
- Navigate by pressing shortly (less than 1sec) ▲ to move to Basic setup



- Press ↵ for 2sec, until "Conf" blinks:



- Navigate by pressing shortly (less than 1sec) ▲ to move to CT setup



- Press ↵ for 2sec, until "5000" blinks, then press shortly using ▲ to the desired value
- Press ↵ for 2sec, until "CT" blinks, then press ↵ for 2sec, until "Basic" blinks, then press ↵ for 2sec, until "Reset" blinks, press shortly using ▲ to move to blinking "Exit" and press ↵ for 2sec to return to initial screen

DATA DISPLAY

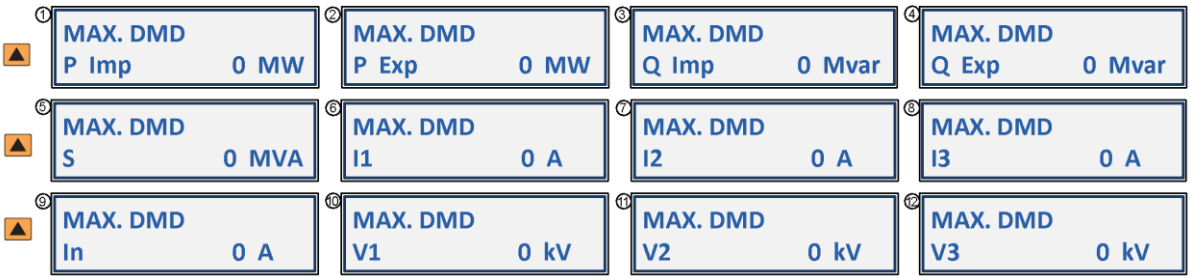
Navigating in Display Mode

The front panel has a simple interface that allows you to display numerous measurement parameters in up to 38 display pages. For easier reading, the parameters are divided into three groups; each group is accessible by pressing the ↵ key and each group page is accessible by pressing the ▲ key.

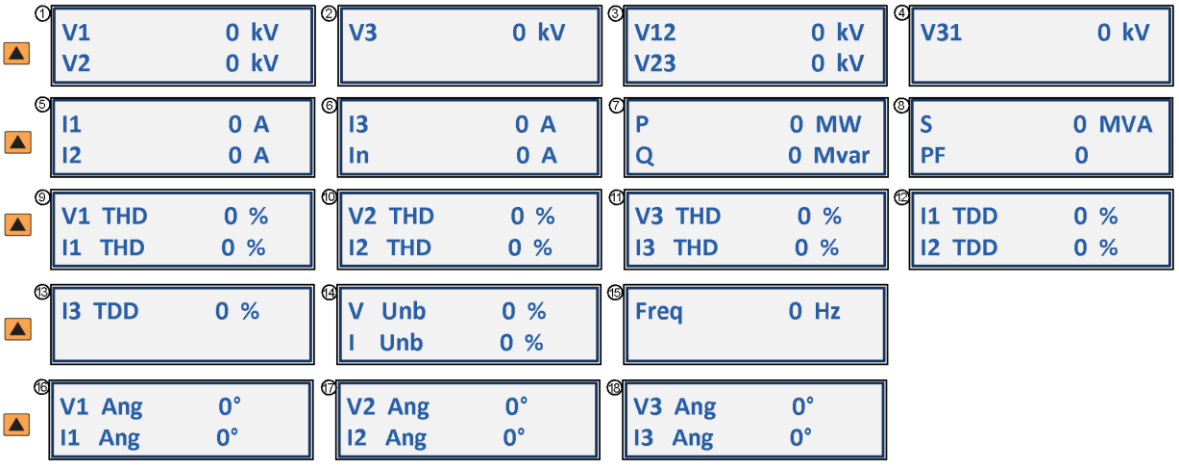
The initial display is as described below:

First push on ↵ will display Energy measurement parameters, by pushing ▲ will navigate to imp., exp. active/reactive, etc …as described below:

Second push on ↵ will display MAX DMD parameters, by pushing ▲ will navigate to MAX DMD P, Q, S, I, etc …as described below:



Third push on ↵ will display Votage/Current measurements, by pushing ▲ will navigate to V (L-N), V (L-L), I, Power, PF, THD, TDD, F, etc …as described below:



Basic Menu

Code	Parameter	Options	Description
ConF	Wiring mode	3OP2	3-wire open delta using 2 CTs
		4Ln3	4-wire Wye using 3 PTs (default)
		3dir2	3-wire direct connection using 2 CTs
		4LL3	4-wire Wye using 3 PTs
		3OP3	3-wire open delta using 3 CTs
		3Ln3	4-wire Wye using 2 PTs
		3LL3	4-wire Wye using 2 PTs
		3bLn3	3-wire Broken delta using 2 PTs, 3 CTs
		3bLL3	3-wire Broken delta using 2 PTs, 3 CTs
Pt Ratio	PT ratio	1.0∗ - 6,500.0	The potential transformer ratio
Pt Factor			
Ct	CT primary current	1-50,000A (5*)	The primary rating of the current transformer
PowDmdPer	Power demand period	1, 2, 5, 10, 15*, 20, 30, 60, E	The length of the period for power demand calculations, **in minutes**. E = external synchronization
Num.Per.	Number of power demand periods	1-15 (1*)	The number of demand periods to be averaged for sliding window demands 1 = block interval demand calculation
ADmdPer.	Ampere/Volt demand period	0-1800 (900*)	The length of the period for volt/ampere demand calculations, **in seconds.** 0 = measuring peak current
Frequency	Nominal frequency	25, 50, 60, 400 (Hz)	The nominal power utility frequency
MaxDmdLd			

- Default setup

Communication Port Menu

COM1 setting

Code	Parameter	Options	Description
Protocol	Communications protocol	ASCII∗, rtu, dnP3	ASCII, Modbus RTU (default) or DNP3.0 protocol
Interface	Interface standard	485	RS-485 interface (default)
Address	Address	ASCII: *0* (default) - *99*, Modbus: *1* (default) *-247*, DNP3.0: *0* (default) *-255*	
Baud Rate	Baud rate	110, 300, 600, 1200, 2400, 4800, 9600 (default), up to 115,200 bps	
Data/Party	Data format	7E, 8E (7/8 bits, even parity), 8n (default) (8 bits, no parity)	
Snd.Delay			

Input and Output Ratings

3 voltage inputs	**57/98-400/690 VAC**	DIRECT INPUT - Nominal: 690V line-to-line voltage, 828V maximum; 400V line-to-neutral, 480V maximum - Burden: <0.5 VA. INPUT USING PT - Burden: <0.15 VA
	Voltage input terminals	4 x Maximum wire section: 2.5 mm² (12 AWG)
3 current nputs (Galvanic isolation*)*	*/5A(10A)*	INPUT VIA CT with 5A secondary output - Burden: <0.2VA, Overload withstands: 20A RMS continuous, 300A RMS for 0.5 second.
	/1A(2A)	INPUT VIA CT with 1A secondary output - Burden: <0.05VA, Overload withstands: 3A RMS continuous, 80A RMS for 0.5 second.
	50A(100A)	INPUT VIA CT with 50A direct connection - Burden: < 0.05VA, Overload withstands: 120A RMS continuous, 2000A RMS for 0.5 second.
	40mA:(optional)	INPUT VIA CT with 40mA secondary output, using external CT – Split Core CT or Solid Core CT – primary 100-1200A maximum rating
	Current input terminals	3 x Maximum wire section: 16 mm²
Communication port COM1	*EIA RS-485 standard*	Optically isolated, max. speed 115.2Kb/s
	COM1 terminals	3 x Maximum wire section: 2.5 mm²
Communication port COM3	*IR COM port*	Infra Red, max. speed 38.4Kb/s
Power Supply (Galvanically isolated)	*40-300V AC/DC (standard)*	50/60 Hz - 9VA
	Power Supply input terminals	3 x Maximum wire section: 2.5 mm²
MODULE 2DI/DO	*DIGITAL INPUT x 2 optically isolated inputs*	Dry contact, internally wetted @ 5VDC
	DIGITAL OUTPUT x 1	0.15A/250 VAC - 400 VDC, 1 contact (SPST Form A)
	2DI/DO terminals	5 x Maximum wire section: 2.5 mm²
MODULE 4DI/2DO (*Optional*)	*DIGITAL INPUT x 2 optically isolated inputs*	Dry contact, internally wetted @ 24VDC
	DIGITAL OUTPUT x 2 *EMR*	5A/250 VAC; 5A/30 VDC, 1 contact (SPST Form A)
	DIGITAL OUTPUT x 2 *SSR*	0.15A/250 VAC - 400 VDC, 1 contact (SPST Form A)
	4DI/2DO terminals	9 x Maximum wire section: 2.5 mm²
MODULE 4 AO *(Optional)*	ANALOG OUT x 4 optically isolated outputs *(4 different options)*	±1 mA, maximum load 5 kΩ (100% overload)
		0-20 mA, maximum load 510 Ω
		4-20 mA, maximum load 510 Ω
		0-1 mA, maximum load 5 k Ω (100% overload)
	4 AO terminals	5 x Maximum wire section: 2.5 mm²
Communication port COM2 *(Optional)*	*Ethernet*	10/100 Base T, auto adaptation speed, Max. speed 100Mb/s
	ETH connector	Shielded RJ45 cable
Communication port COM2 *(Optional)*	*Profibus*	Max. speed 12 Mb/s
	Profibus terminals	5 x Maximum wire section: 2.5 mm2 (12 AWG) or using terminal to DB9 converter: P/N AC0153 REV.A2
Communication port COM2 *(Optional)*	*EIA RS-232-422/485 standard*	Optically isolated, max. speed 115.2Kb/s – *to be connected to GPRS modem if ordered*
	COM2 terminals	5 x Maximum wire section: 2.5 mm² And DB9 connector