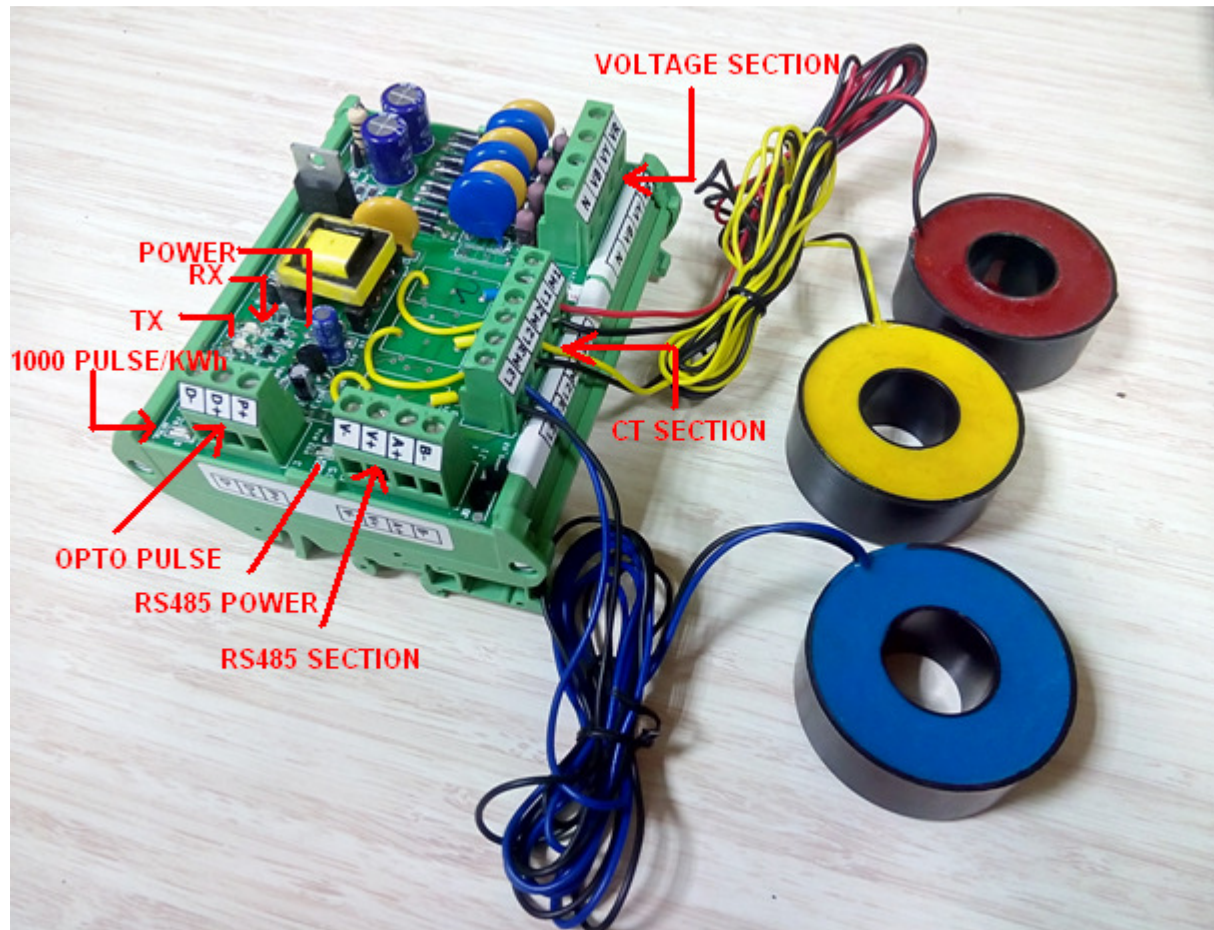


## Blind Measuring Module



BMM (Blind Measuring Module) is multi functional unit which supports only 3P4W installation. BMM take 3 Voltage inputs & 3 Amps inputs for measurement. BMM measures phase wise Voltage, Amps, PF, Power as well as System Power, Energy, Frequency. For demand calculation BMM has Fixed 30 Minute window, based on Real Time Clock for KW as well as KVA. BMM provides one RS485 port with Modbus-RTU protocol to communicate with external world. As BMM receive any data over RS485 then “RxD” led will glow and if BMM is responding over RS485 then “TxD” led will glow. As unit power up, “POWER” led glows. BMM provides pulse on led (1000 Pulse/KWh) as well as on isolated opto coupler.

## Voltage Connection:



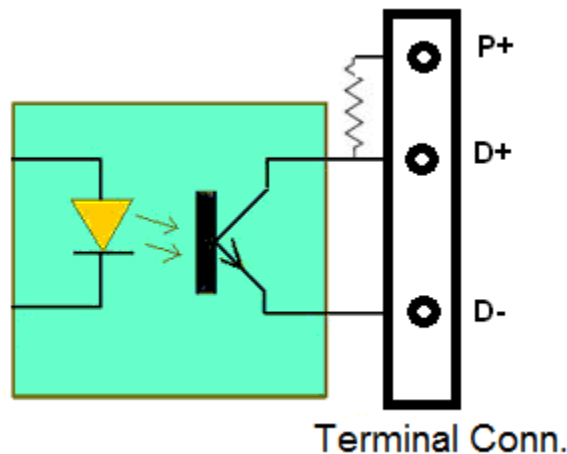
As per PCB, this is a J7. Make ensure that 1 Amps rated fuse should connected on 3 phase voltages to protect hardware from unintentional damage.

## CT Connection:



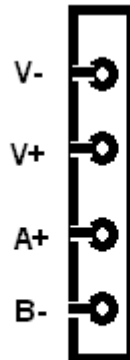
As per PCB, this is a J2. Each CT (Current Transformer) has its own error which differs from each other. To get better accuracy BMM is calibrated with individual CTs. So, during connection make ensure that it should not interchange with other units.

## Opto Terminal Connection:



As per PCB, this is a J3. There is on board 1KΩ (0.125 Watt) register between P+ & D+ Terminal. Maximum Voltage between Collector to Emitter is 20 Volt DC. If don't want to use on board register then ignore P+ terminal.

## RS485 Connection:



As per PCB, this is a J8. RS485 requires external power supply V+(Vcc) & V-(Gnd) (8V to 20V DC). Make ensure that supply connection should not reverse otherwise it can damage the hardware.

Unit has no display so RS485 is very important part to view all measurement data. It supports MODBUS-RTU protocol to connect with SCADA or EMS Software. Each unit should have unique station id over RS485 bus. The data which can be read using MODBUS query # 3 (Read Holding Registers) is provided in an address map.

Communication line parameters: 9600/8/N/1

All addresses are in decimal whose parameters are float (32-bit). If illegal address is sent in query or host, try to read more than 224 bytes of data in one query except message is generated. The parameters name and address are mentioned below.

<b>ADDRESS MAP</b>		
<b>ADDRESS</b>	<b>PARAMETERS</b>	<b>Type</b>
200	VRN	Float – 32 Bit
202	VYN	
204	VBN	
206	AVG.PN	
208	VRY	
210	VYB	
212	VBR	
214	AVG.PP	
216	IR	
218	IY	
220	IB	

222	AVG.AMP
224	KVA_R
226	KVA_Y
228	KVA_B
230	KW_R
232	KW_Y
234	KW_B
236	KVAR_R
238	KVAR_Y
240	KVAR_B
242	PF_R
244	PF_Y
246	PF_B
248	SYS.PF
250	SYS.KVA
252	SYS.KW
254	SYS.KVAR
256	FREQUENCY
258	SYS.KWH
260	SYS.KVAH
262	SYS.KVARH
264	KW_DEMAND
266	MAX_KW_DEMAND
268	MAX_DEMAND_KW_YEAR
270	MAX_DEMAND_KW_MONTH
272	MAX_DEMAND_KW_DATE
274	MAX_DEMAND_KW_HOUR
276	MAX_DEMAND_KW_MINUTE
278	MAX_DEMAND_KW_SEC
280	KVA_DEMAND
282	MAX_KVA_DEMAND
284	MAX_DEMAND_KVA_YEAR
286	MAX_DEMAND_KVA_MONTH
288	MAX_DEMAND_KVA_DATE
290	MAX_DEMAND_KVA_HOUR
292	MAX_DEMAND_KVA_MINUTE
294	MAX_DEMAND_KVA_SEC
296	RTC_YEAR
298	RTC_MONTH
300	RTC_WEEK_DAY
302	RTC_DATE

304	RTC_HOUR	
306	RTC_MINUTE	
308	RTC_SEC	
310	FEATURE USE	

Real Time Clock can be set over RS485 using MODBUS query # 6. Addresses for RTC are shown in below table.

ADDRESS MAP over Query: 06		
ADDRESS	PARAMETERS	RANGE
388	RTC Second	0 to 59
389	RTC Minute	0 to 59
390	RTC Hour	0 to 23
391	RTC Date	1 to 31
392	RTC Month	1 to 12
393	RTC Year	0 to 99
394	RTC Weekday	0 to 6, 0 for Sunday, 6 for Saturday

Each BMM unit should have unique station id to communicate over RS485 bus. To program station id, we are providing utility as shown in screen shot. While applying command "APPLY" make sure that only one unit has jumper at "AMP". Without jumper it will ignore "PROGRAM STATION ID" command. Ensure that at a time only one unit have jumper.

The screenshot shows the BMM software interface with the following configuration details:

- Meter ID: 1
- COM PORT: 1
- CONNECT button
- Voltage**: R-Phase, Y-Phase, B-Phase (input fields)
- Amps**: R-Phase, Y-Phase, B-Phase (input fields)
- PROGRAM STATION ID**: Meter ID: 1, APPLY button, PROG RTC & ID button
- KW**: R-Phase, Y-Phase, B-Phase (input fields)
- KVAR**: R-Phase, Y-Phase, B-Phase (input fields)
- Energy**: KWh, KVAh, KVARh (input fields)
- Others:** Vry, Vyb, Vbr, Avg.VLN, Avg.VLL, Avg.AMPS, PF\_R, PF\_Y, PF\_B, KVA\_R, KVA\_Y, KVA\_B, Sys.PF, Sys.KW, Sys.KVA, Sys.KVAR, Hz, KW-D, KW-MD, KVA-D, KVA-MD (input fields)

## Technical Specifications:

Parameters		
Type	Name	Statistics
INPUT	Three Phases and Neutral of a 3P4W system	
	Voltage	Direct Voltage Input : Up to 300V L-N
		PT Ratio : 1
		Burden : 1 VA
	Current	Secondary Current Input: - -
CT Ratio : 1		
Range of Reading : up to 70 Amps		
Burden : < 1.0VA		
Power Supply	Overload : 75A RMS Continuous	
	Auxiliary Supply: 90 - 270 VAC (P-N), 50-60 Hz. (Power Up from 3 Phase Voltage Input)	
MEASUREMENT	True RMS Basic Parameters	Voltage (Volts L-N & L-L)
		VL-N Accuracy : 0.5% of Reading
		VL-L Accuracy : 1.0% of Reading
	Current (Amps IR, IY, IB)	Accuracy : 1% of Reading
		Line Frequency
Power	Active Power (P)	Accuracy : 1% of Reading (For IPFI>0.5)
	Reactive Power (Q)	Accuracy : 1.5% of Reading (Between 0.5 Lag to 0.8 Lead)

	Apparent Power (S)	Accuracy : 1% of Reading
	Power Factor	For Individual phases and System. Accuracy : 1.0% of Reading ( $IPFI \geq 0.5$ ) Range of Reading : 0.05 to 1.00 Lag/Lead
Energy	Total Active Energy (KWh)	Range of Reading : 0 to 9999999.9 KWh Accuracy : Class 1 as per IS13779
	Total Apparent Energy (KVAh)	Range of Reading : 0 to 9999999.9 KVAh Accuracy : Class 1
	Total Apparent Energy (KVARh)	Range of Reading : 0 to 9999999.9 KVARh Accuracy : Class 1
Demand	Active Power (KW) Demand – 30 Minute Fixed Window	
	Apparent Power (KVA) Demand - 30 Minute Fixed Window	