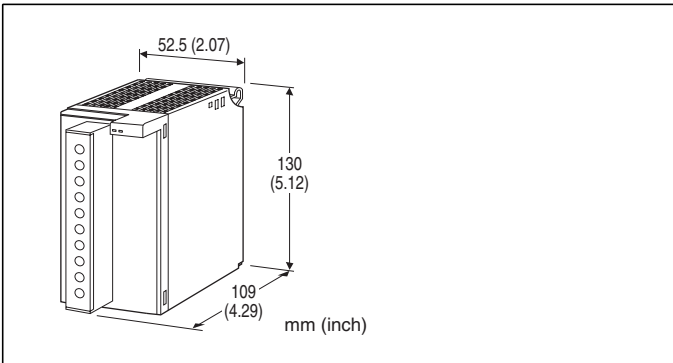


Remote I/O R3 Series

MULTI POWER INPUT MODULE

(clamp-on current sensor type CLSB use)



MODEL: R3-WT1B[1][2][3][4]

ORDERING INFORMATION

- Code number: R3-WT1B[1][2][3][4]
Specify a code from below for each of [1] through [4].
(e.g. R3-WT1B11W/Q)
- Specify the specification for option code /Q
(e.g. /C01)

NO. OF SYSTEMS

1B: 1, Sensor type CLSB

[1] CONFIGURATION

- 1: 3-phase / 3-wire
- 2: Single-phase / 2-wire
- 3: Single-phase / 3-wire

[2] INPUT (unbalanced load)

- 1: 110 V AC / 50 A
- 2: 110 V AC / 100 A
- 5: 220 V AC / 50 A
- 6: 220 V AC / 100 A
- A: 100 V / 200 V AC / 50 A (single-phase/3-wire)
- B: 100 V / 200 V AC / 100 A (single-phase/3-wire)

[3] COMMUNICATION MODE

- S: Single
- W: Dual

[4] OPTIONS

- blank: none
- /Q: With options (specify the specification)

SPECIFICATIONS OF OPTION: Q

COATING (For the detail, refer to M-System's web site.)

- /C01: Silicone coating
- /C02: Polyurethane coating
- /C03: Rubber coating

RELATED PRODUCTS

- PC configurator software (model: R3CON)
The R3CON is used to set up the software setting of this module. Downloadable at M-System's web site.
 - Clamp-on current sensor (model: CLSB-05)
 - Clamp-on current sensor (model: CLSB-10)
- Note: The clamp-on current sensor, not included in the product package of the R3 module, must be ordered separately. Refer to the data sheet for the sensor for more information such as applicable wire diameter.

GENERAL SPECIFICATIONS

Connection

- Internal bus:** Via the Installation Base (model: R3-BSx)
- Input:** M3.5 screw terminals (torque 0.8 N·m)
- Internal power:** Via the Installation Base (model: R3-BSx)

Screw terminal: Nickel-plated steel

Isolation: Sensor core to sensor output or current input or internal bus or internal power to voltage input

DIP switch settings:

- Computation methods
- Count Reset (Disable/Enable)
- Others

Refer to the instruction manual for details.

RUN indicator: Bi-color (red/green) LED;
Red when the bus A operates normally;
Green when the bus B operates normally;
Amber when both buses operate normally.

ERR indicator: Bi-color (red/green) LED;
Red with input abnormality;
Green in normal operating conditions.

Power ON timer: Starts conversion in 10 seconds after the power is turned on.

Low-end cutout: Converted data forced to 0 % for 2 % or less input. (Selectable by using R3CON)

Computation

Active power, reactive power: Time division multiplication

Power factor: Calculated with active power (P) and reactive power (Q)

$$\frac{P}{\sqrt{P^2 + Q^2}}$$

Frequency: One-shot

INPUT SPECIFICATIONS

Frequency: 50 or 60 Hz

• **Voltage Input**

Operational range: 0 – 120 % of rating

Overload capacity: 150 % of rating for 10 sec., 120 % continuous

• **Current Input**

Range

CLSB-05: 0 – 50 A AC

CLSB-10: 0 – 100 A AC

Operational range: 0 – 115 % of rating

Be sure that the input voltage is of 440 V or less.

■ **Power Factor Input Range:**

-1 – lag 0 – 1 – lead 0 – -1

Data range: -1000 – 0 – 1000 – 0 – -1000 with SW2-1 set to OFF

A device which employs different measuring methods may show different outputs from that of M-System's.

■ **Frequency Input Range:** 45 – 65 Hz

Data range: 4500 – 6500

■ **ACTIVE / REACTIVE POWER INPUT RANGE**

• **Single-phase/2-wire**

INPUT	USABLE RANGE	VT BURDEN (VA)
110V / 50A	±5500W	0.2/phase
110V / 100A	±11000W	
220V / 50A	±11000W	0.4/phase
220V / 100A	±22000W	

• **Single-phase/3-wire**

INPUT	USABLE RANGE	VT BURDEN (VA)
200V / 50A	±10000W	0.2/phase
200V / 100A	±20000W	

• **3-phase/3-wire**

INPUT	USABLE RANGE	VT BURDEN (VA)
110V / 50A	±9526W / ^{lead} _{lag} 9526 var	0.2/phase
110V / 100A	±19050W / ^{lead} _{lag} 19050 var	
220V / 50A	±19050W / ^{lead} _{lag} 19050 var	0.4/phase
220V / 100A	±38100W / ^{lead} _{lag} 38100 var	

Reactive power data in Lead: Positive, Lag: Negative

Note: Invalid in single-phase systems.

Choose VT ratio so that the calibration range calculated by the following equation is within the usable range in the above table.

$$\text{Calibration Range [W]} = \frac{\text{Measuring Wattage [W]}}{(\text{VT Ratio}) \times (\text{Current Rating})}$$

INSTALLATION

Operating temperature: -10 to +55°C (14 to 131°F)

Operating humidity: 30 to 90 %RH (non-condensing)

Atmosphere: No corrosive gas or heavy dust

Mounting: Installation Base (model: R3-BSx)

Weight: 300 g (0.66 lb)

PERFORMANCE

Accuracy

(at 23°C ±10°C or 73.4°F ±18°F, 45 – 65 Hz) (Except the sensor's accuracy.)

Active / reactive power: ±2 % (Add sensor's accuracy for overall performance)

Power factor: ±4 % (Add sensor's accuracy for overall performance)

Frequency: ±1 %

Active / reactive energy: ±2 % (Add sensor's accuracy for overall performance)

Magnetic field (ext. origin) effect: ± 0.5 % (400 A/m)

Conversion rate: 100 msec.

Conversion data: 16 bits / 32 bits

Data allocation: 4, 8 or 16 selectable

Current consumption: 150 mA

Response time: ≤ 2 sec. (0 – 100 % ±1 %)

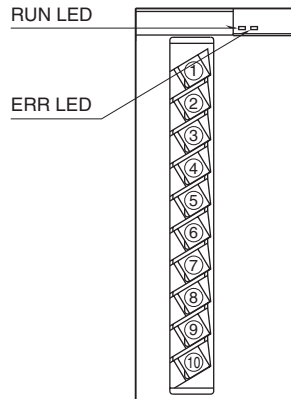
Insulation resistance: ≥ 100 MΩ with 500 V DC

Dielectric strength: 2000 V AC @ 1 minute (voltage input to current input or internal bus or internal power)

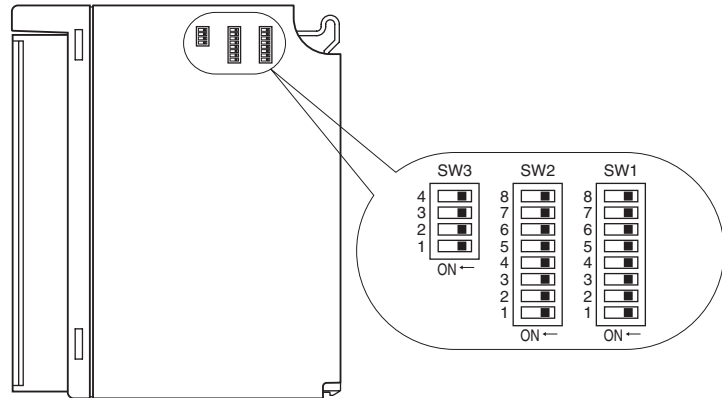
2000 V AC @ 1 minute (power input to FG; isolated on the power supply module)

EXTERNAL VIEW

■ FRONT VIEW



■ SIDE VIEW



TRANSMISSION DATA DESCRIPTIONS

ADDRESS	CONTENTS
n	Active power * 2
n + 1	Reactive power * 2
n + 2	Power factor * 2
n + 3	Frequency * 2
n + 4	Incoming active energy (lower bits)] * 3
n + 5	Incoming active energy (upper bits)] * 3
n + 6	Outgoing active energy (lower bits)] * 3
n + 7	Outgoing active energy (upper bits)] * 3
n + 8	LAG reactive energy (lower bits)] * 3
n + 9	LAG reactive energy (upper bits)] * 3
n + 10	LEAD reactive energy (lower bits)] * 3
n + 11	LEAD reactive energy (upper bits)] * 3
n + 12	0
n + 13	0
n + 14	0
n + 15	0
R3CON type ID	WT1B***
Network module data allocation mode example *1	4, 8, 16

n = I/O address on the installation base

Factory setting = 1 kWh and 1 kvarh per bit.

Data address depends upon the data allocation mode as indicated below:

4 (n thr. n+3)

8 (n thr. n+7)

16 (n thr. n+15)

*1. Fixed at 16 for the R3-NPx.

*2. 16-bit data

*3. 32-bit data

I/O DATA DESCRIPTIONS

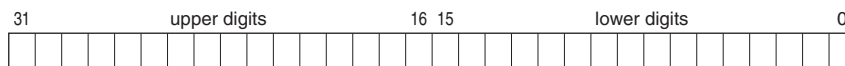
■ 16-BIT DATA

16-bit binary data. Minus values are represented in 2's complements.

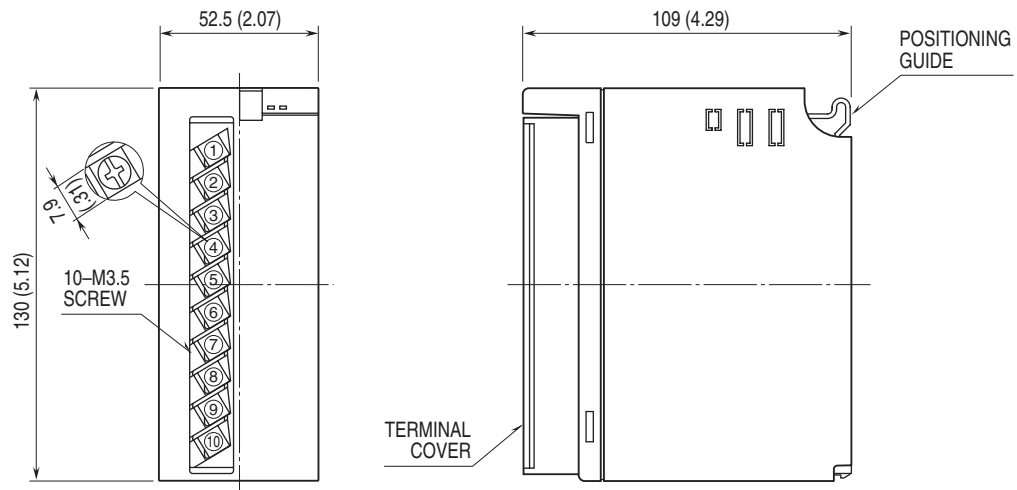


■ 32-BIT DATA

32-bit binary data. Minus values are represented in 2's complements.

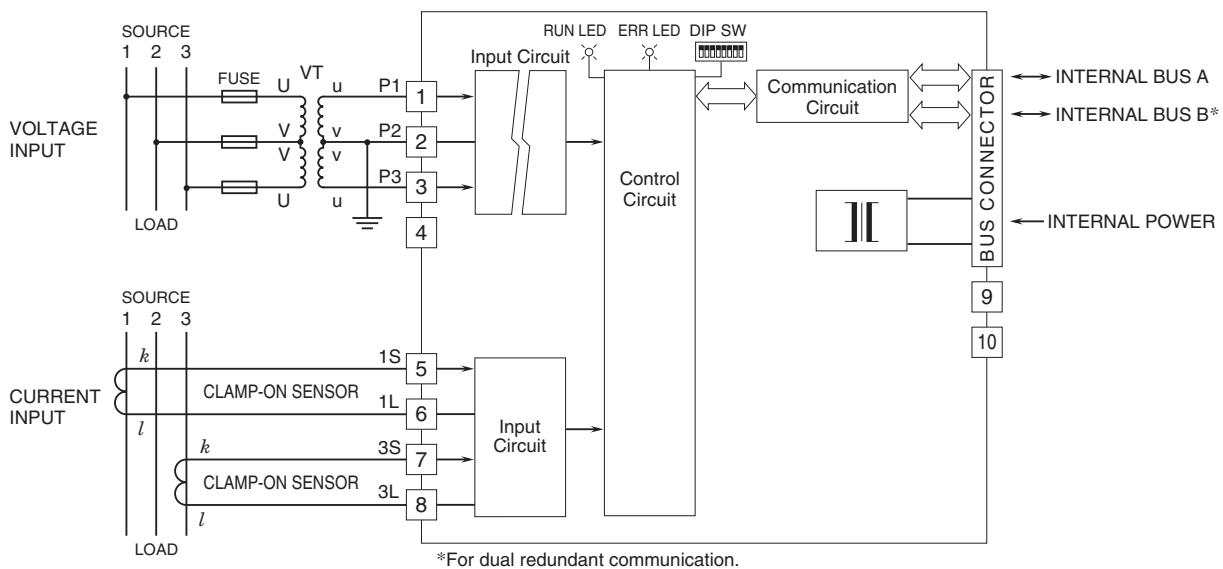


EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm (inch)

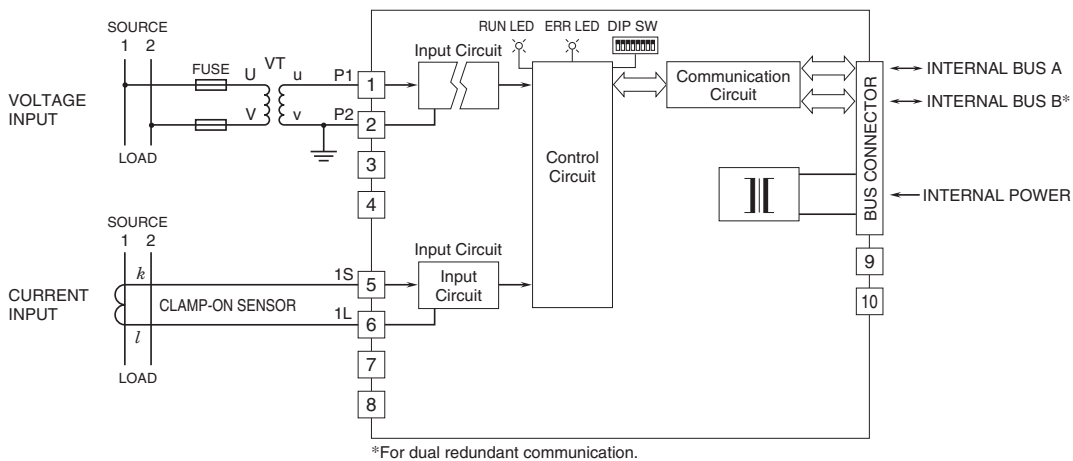


SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM

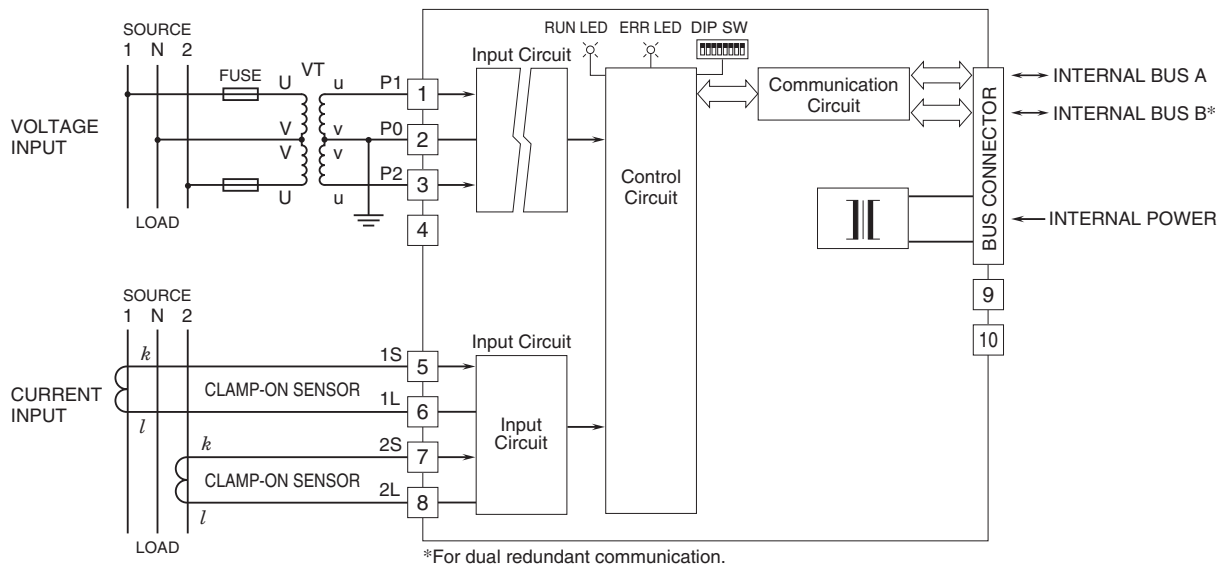
■ 3-PHASE/3-WIRE



■ SINGLE-PHASE/2-WIRE



■ SINGLE-PHASE/3-WIRE



Specifications are subject to change without notice.