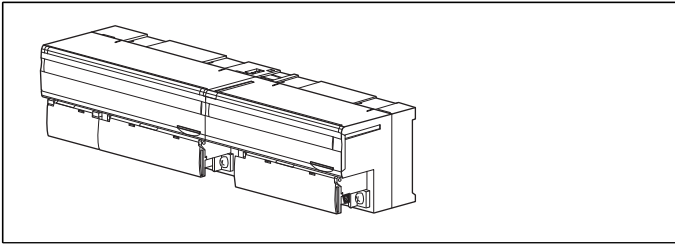


Remote I/O R7 Series

MULTI POWER MONITORING MODULE

(Clamp-on current sensor CLSE, Modbus)



ORDERING INFORMATION

- Basic module: R7MWTU-2[1]1-AD4[2]
Specify a code from below for each of [1] and [2].
(e.g. R7MWTU-221-AD4/Q)
- Specify the specification for option code /Q
(e.g. /C01/SET)
- Extension module: R7MWTU-EA8[1]
(e.g. R7MWTU-EA8/Q)
Specify a code from below for [1].
- Specify the specification for option code /Q
(e.g. /C01)

BASIC MODULE: R7MWTU-2[1]1-AD4[2]

CONFIGURATION

- 2: Single phase / 2-wire and 3-wire,
3-phase / 3-wire and 4-wire

[1] NO. OF SYSTEMS

- 1: 1 system, Di / Pi x 4 (internal power 5 V)
(no connection with extension module)
2: 2 systems

INPUT

- 1: 240 V AC / CLSE

POWER INPUT

Universal

- AD4:** 100 - 240 V AC / 110 - 240 V DC (universal)
(Operational voltage range 85 - 264 V AC, 50 - 60 Hz /
99 - 264 V DC, ripple 10 %p-p max.)

[2] OPTIONS

blank: none

- /Q: With options (specify the specification)

EXTENSION MODULE: R7MWTU-EA8[1]

I/O TYPE

EA8: Di / Pi, 8 points (internal power 5 V)

[1] OPTIONS

blank: none

- /Q: Option other than the above (specify the specification)

SPECIFICATIONS OF OPTION: Q (multiple selections)

COATING (For the detail, refer to our web site.)

/C01: Silicone coating

/C02: Polyurethane coating

/C03: Rubber coating

EX-FACTORY SETTING

/SET: Preset according to the Ordering Information Sheet (No. ESU-7816)

(The ordering information sheet is available only for the basic module.)

FUNCTIONS & FEATURES

The R7MWTU is a Multi Power Monitoring Module for Modbus.

The R7MWTU uses clamp-on current sensors, there is no need of current transformers.

Current sensors are easy to install in existing systems. Wide input range of 5 to 600 A is available.

All measured values, counter values, display mode, setting data are stored in the non-volatile memory when power is off.

A 'basic' module can be attached with an 'extension' module (except R7MWTU-211-AD4) because of this, it is able to use it as 2-circuit power and 8 discrete inputs module.

RELATED PRODUCTS

- PC configurator software (model: PMCFG)

Downloadable at our web site.

A dedicated cable is required to connect the module to the PC. Please refer to the internet software download site or the users manual for the PC configurator for applicable cable types.

- Clamp-on current sensor (model: CLSE)

The clamp-on current sensors, not included in this product package, must be ordered separately. Required number depends upon the system configuration.

PACKAGE INCLUDES...

- Terminating resistor (110 Ω, 0.25 W)

GENERAL SPECIFICATIONS

Connection: M3 separable screw terminal (torque 0.5 N·m)
Solderless terminal: Refer to the drawing at the end of the section.

Recommended manufacturer: Japan Solderless Terminal MFG.Co.Ltd, Nichifu Co.,Ltd

Applicable wire size: 0.25 to 1.65 mm² (AWG 22 to 16)

Configuration: Single phase/2-wire and 3-wire, 3-phase/3-wire balanced/unbalanced load, 3-phase/4-wire balanced/unbalanced load

Screw terminal: Nickel-plated steel

Housing material: Flame-resistant resin (gray)

Isolation: Sensor core to sensor output or current input or voltage input to discrete input to Modbus or FG to power

Measured variables

Voltage: 1-N, 2-N, 3-N, 1-2, 2-3, 3-1

Current: 1, 2, 3, N

Active / reactive / apparent power: 1, 2, 3, Σ

Power factor: 1, 2, 3, Σ

Frequency

Active energy: Incoming / outgoing

Reactive energy: Incoming / outgoing / lag (inductive) /lead (capacitive)

Apparent energy

Active / reactive / apparent power intervals (demand)

Average (demand) current: 1, 2, 3, N

Harmonic contents: Σ

Voltage: 1-N, 2-N, 3-N, 1-2, 2-3, 3-1

Current: 1, 2, 3, N

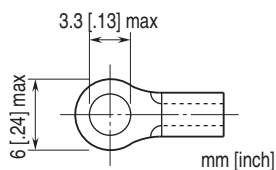
Max. and min. values

Demand history: 1 to 4

Operating mode setting: Configurator software and DIP switch setting; connection, balanced/unbalanced, clamp-on sensor type (refer to the manual for details)

Status indicator LED: PWR

■ Recommended solderless terminal size - M3



MODBUS COMMUNICATION

Communication: Half-duplex, asynchronous, no procedure

Standard: Conforms to TIA/EIA-485-A

Transmission distance: 500 meters max.

Protocol: Modbus - RTU or Modbus - ASCII

Max. number of nodes: 31 (excluding master)

Node address setting: 1 - 99 (with rotary switch) (factory default setting: 00)

Baud rate setting: With rotary switch 38.4 kbps (default)

19.2 kbps, 9600 bps, 4800 bps

Status indicator LED: RUN, ERR, SD, RD

INPUT SPECIFICATIONS

Frequency: 50 / 60 Hz (45 - 65 Hz)

• Voltage Input

Rated voltage

Line-to-line (delta voltage): 240 V

Line-neutral (phase voltage): 138 V (three-phase/4-wire)

Consumption VA: ≤ U_{LN}² / 300 kΩ / phase

Overload capacity: 200 % of rating for 10 sec., 120 % continuous

Selectable primary voltage range: 50 - 400 000 V

• Current Input

CLSE-R5: 0 - 5 A AC

CLSE-05: 0 - 50 A AC

CLSE-10: 0 - 100 A AC

CLSE-20: 0 - 200 A AC

CLSE-40: 0 - 400 A AC

CLSE-60: 0 - 600 A AC

Overload capacity: 120 % continuous, 500 % for 10 sec.

(Note: Use for the circuit not exceed 480 V)

Selectable primary current range: 1 - 20 000 A (only with CLSE-R5, refer to the configurator settings)

Operational range

Current: 0 - 120 % of the rating

Voltage: 10 - 120 % of the rating

Apparent power: ≤ 120 % of the rating

Active/reactive power: ±120 % of the rating

Frequency: 45 - 65 Hz

Power factor: ±1

■ Discrete input

Common: Negative common

Maximum frequency: 10 Hz

Minimum pulse width: 50 msec.

Totalized pulse range: 0 - 999 999 999

Count at overflow: Reset and restart at '1.'

Detecting voltage/current: 5 V DC / 5 mA approx.

Detecting levels: ≤ 5 kΩ / ≤ 2 V for ON;

≥ 100 kΩ / 4 V for OFF

Operation mode: Discrete and pulse counter

INSTALLATION

Power consumption

•AC:

Basic module: < 5 VA

Basic with extension module: < 6 VA

•DC:

Basic module: < 1.5 W

Basic with extension module: < 2 W

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

Storage temperature: -20 to +65°C (-4 to +149°F)

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

Atmosphere: No corrosive gas or heavy dust

Mounting: DIN rail

Weight:

Basic module: 200 g (0.44 lb)

Extension module: 90 g (0.2 lb)

PERFORMANCE

Accuracy (at 10 - 35°C or 50 - 95°F, 45 - 65 Hz)

Add the accuracy of the current sensor for overall values.

Voltage: ±0.5 % of the rating

Current: ±0.5 % of the rating

Power: ±1.0 % of the rating

Power factor: ±1.5 %

Frequency: ±0.1 % of the rating

Energy: ±2.0 % of the rating (range 5 - 100 %, PF 1)

Harmonic contents: ±2.0 % of the rating

The described accuracy levels are ensured at the input 1 % or more for phase 2 current with 3-phase/3-wire unbalanced load, for neutral current with 3-phase/4-wire unbalanced load, and neutral current with 1-phase/3-wire.

Data update period:

Frequency: ≤ 1 sec.

Other: ≤ 500 msec.

Insulation resistance: ≥ 100 MΩ with 500 V DC

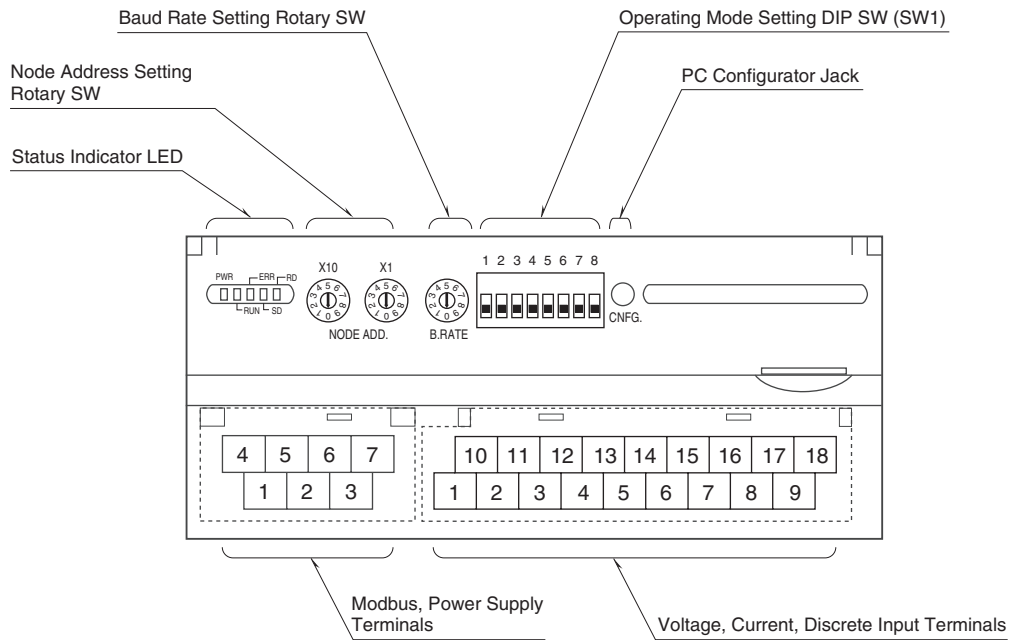
Dielectric strength:

2000 V AC @ 1 minute (current input or voltage input or discrete input to Modbus or FG to input power)

1000 V AC @ 1 minute (current input or voltage input to discrete input)

EXTERNAL VIEW

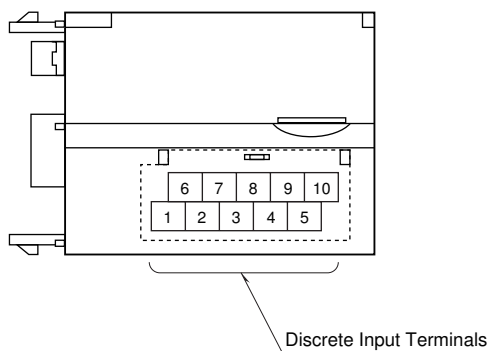
■ BASIC MODULE



■ STATUS INDICATOR LED

LED	COLOR	STATUS	OPERATION
PWR	Red	ON	Normal operating
		Blink ≈0.5 Hz	No input or input overflow
		Blink ≈2 Hz	Setting error or device abnormality
		OFF	Internal power 5V abnormality
RUN	Red	ON	Normal communication
ERR	Red	ON	Receiving data error
SD	Red	ON	Sending data
RD	Red	ON	Receiving data

■ EXTENSION MODULE



TERMINAL CONNECTIONS

System / Application	Terminal	System / Application	Terminal
Single phase / 2-wire		Single phase / 3-wire Three phase / 3-wire unbalanced load (2CT)	
Three phase / 3-wire, balanced load		Three phase / 4-wire, balanced load	
Three phase / 4-wire, unbalanced load			

Note: Use CLSE for CT.
Grounding is unnecessary for low-voltage circuit.

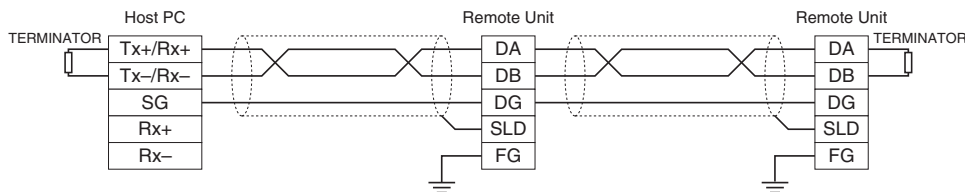
CONNECTION DIAGRAMS

POWER SUPPLY, Modbus TERMINAL ASSIGNMENT

4	5	6	7
DA	DG	U(+)	V(-)
1	2	3	
DB	SLD	FG	

- 1. DB
- 2. SLD
- 3. FG
- 4. DA
- 5. DG
- 6. U (+)
- 7. V (-)

MASTER CONNECTION



Be sure to connect the terminating resistor included in the product package to the unit at both ends of transmission line.
The terminator must be connected across DA and DB.
The Host PC can be located other than at the extreme ends of transmission line.

TERMINAL ASSIGNMENTS

■ BASIC MODULE

• 1 Circuit, 4 point discrete

10	11	12	13	14	15	16	17	18
P3	NC	NC	1K	2K	3K	DI1+	DI3+	COM
1	2	3	4	5	6	7	8	9
P1	P2	N	1L	2L	3L	DI2+	DI4+	COM

PIN No.	ID	FUNCTION	PIN No.	ID	FUNCTION
1	P1	Voltage Input P1	10	P3	Voltage Input P3
2	P2	Voltage Input P2	11	NC	Unused
3	N	Voltage Input N	12	NC	Unused
4	1ch 1L	1ch current input 1L	13	1ch 1K	1ch current input 1K
5	1ch 2L	1ch current input 2L	14	1ch 2K	1ch current input 2K
6	1ch 3L	1ch current input 3L	15	1ch 3K	1ch current input 3K
7	DI2 +	Discrete input 2	16	DI1 +	Discrete input 1
8	DI4 +	Discrete input 4	17	DI3 +	Discrete input 3
9	COM	Discrete input common	18	COM	Discrete input common

• 2 Circuits

10	11	12	13	14	15	16	17	18
P3	NC	NC	1K	2K	3K	1K	2K	3K
1	2	3	4	5	6	7	8	9
P1	P2	N	1L	2L	3L	1L	2L	3L

PIN No.	ID	FUNCTION	PIN No.	ID	FUNCTION
1	P1	Voltage Input P1	10	P3	Voltage Input P3
2	P2	Voltage Input P2	11	NC	Unused
3	N	Voltage Input N	12	NC	Unused
4	1ch 1L	1ch current input 1L	13	1ch 1K	1ch current input 1K
5	1ch 2L	1ch current input 2L	14	1ch 2K	1ch current input 2K
6	1ch 3L	1ch current input 3L	15	1ch 3K	1ch current input 3K
7	2ch 1L	2ch current input 1L	16	2ch 1K	2ch current input 1K
8	2ch 2L	2ch current input 2L	17	2ch 2K	2ch current input 2K
9	2ch 3L	2ch current input 3L	18	2ch 3K	2ch current input 3K

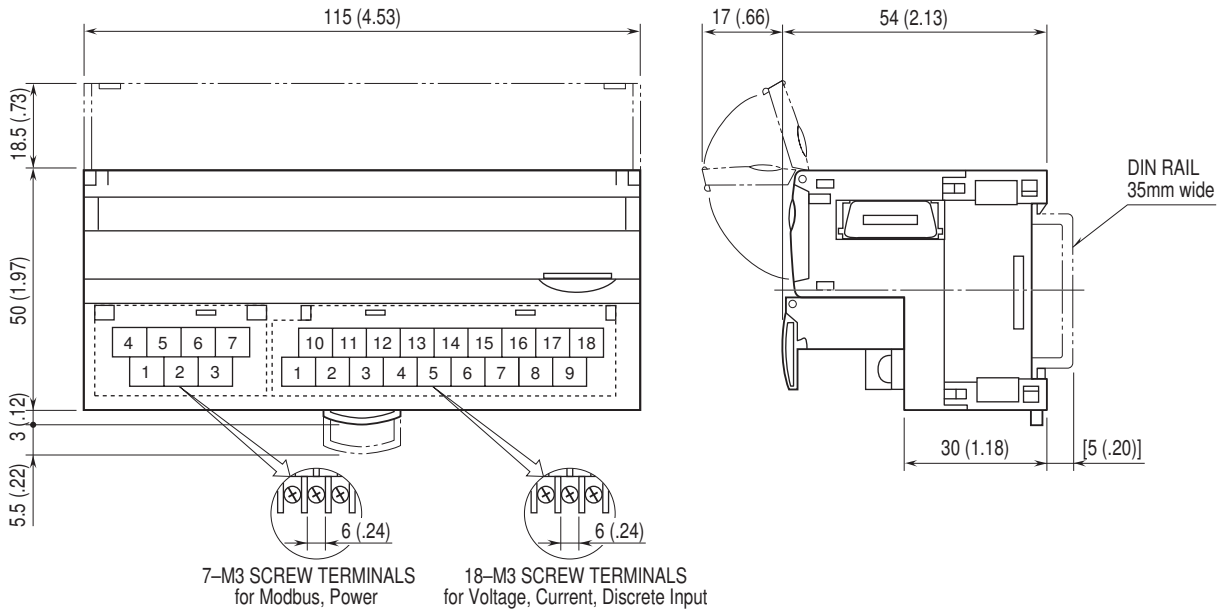
■ EXTENSION MODULE

6	7	8	9	10
COM	DI1+	DI3+	DI5+	DI7+
1	2	3	4	5
COM	DI2+	DI4+	DI6+	DI8+

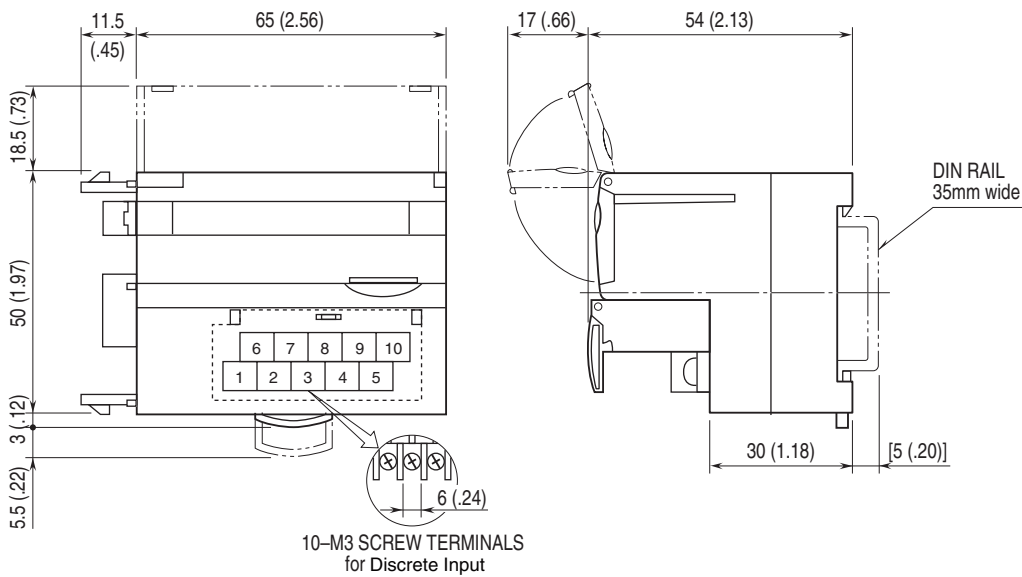
No.	ID	FUNCTION	No.	ID	FUNCTION
1	COM	Common	6	COM	Common
2	DI2 +	Discrete input 2	7	DI1 +	Discrete input 1
3	DI4 +	Discrete input 4	8	DI3 +	Discrete input 3
4	DI6 +	Discrete input 6	9	DI5 +	Discrete input 5
5	DI8 +	Discrete input 8	10	DI7 +	Discrete input 7

EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm [inch]

■ BASIC MODULE



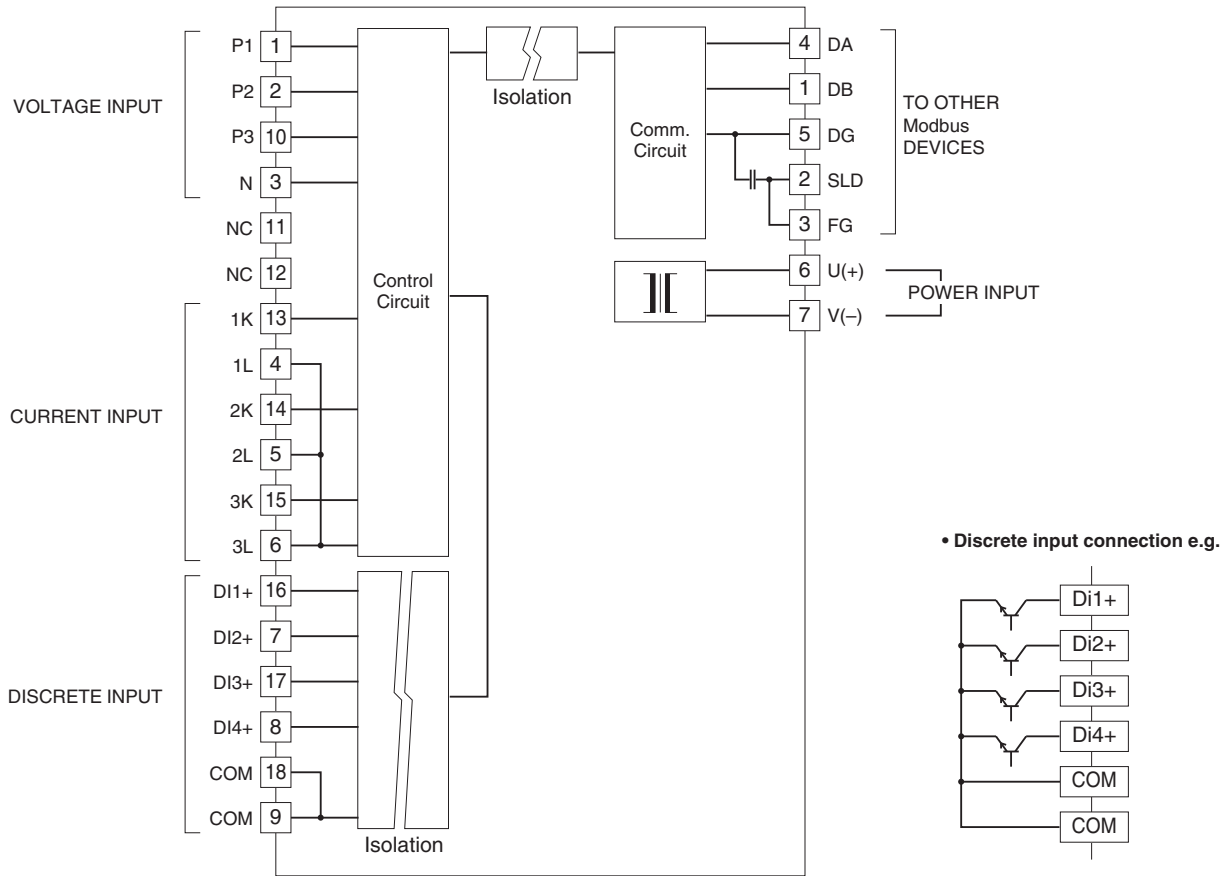
■ EXTENSION MODULES



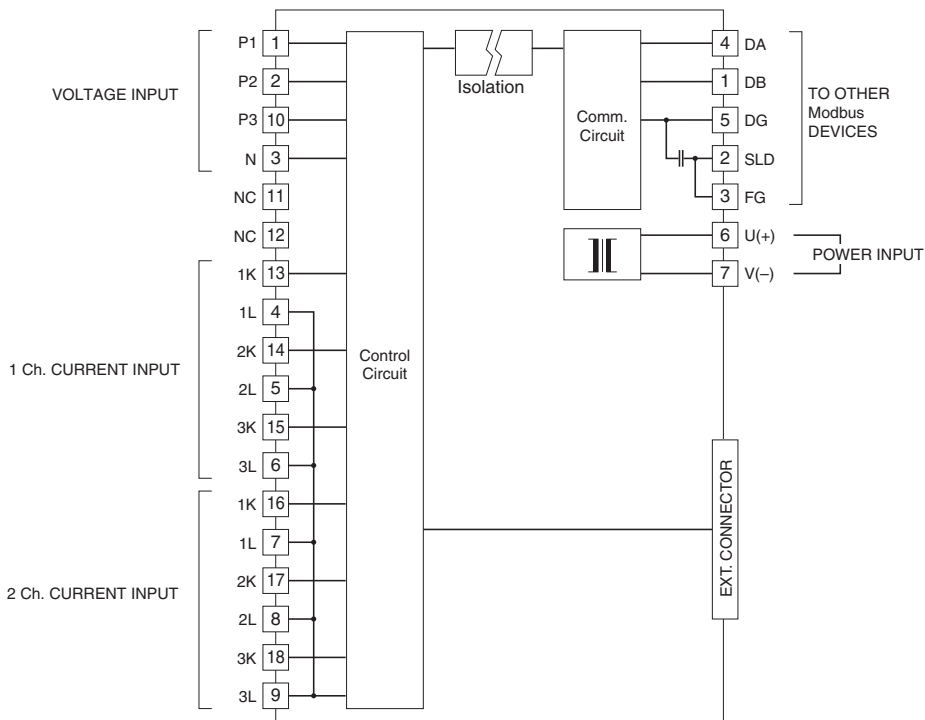
SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM

■ BASIC MODULE

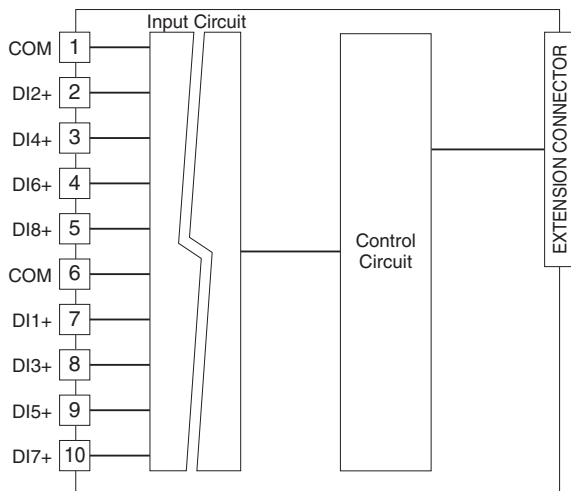
• 1 Circuit, 4-point Discrete Inputs



• 2 Circuits



■ EXTENSION MODULE



Specifications are subject to change without notice.