# MODEL: R7LWTU

Remote I/O R7 Series

MULTI POWER MODULE
(Clamp-on current sensor CLSE, LonWorks)
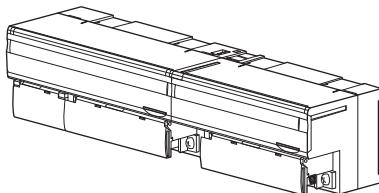
ORDERING INFORMATION
• Basic module: R7LWTU-2[1]1-AD4[2]
Specify a code from below for each [1] and [2].
   (e.g. R7LWTU-221-AD4/Q)
• Specify the specification for option code /Q
   (e.g. /C01)

• Extension module: R7LWTU-EA8[1]
Specify a code from below for [1].
   (e.g. R7LWTU-EA8/Q)
• Specify the specification for option code /Q
   (e.g. /C01)

MODEL: R7LWTU-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: R7LWTU-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
COATING (For the detail, refer to M-System's web site.)
/C01: Silicone coating
/C02: Polyurethane coating
/C03: Rubber coating

FUNCTIONS & FEATURES
The R7LWTU is a Multi Power Module for LonWorks.
The R7LWTU 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 availabe.
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 R7LWTU-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)
• XIF File (Device Interface File)
XIF file is used to define a LonWorks device when programmed on LonMaker.
The XIF files and Software are downloadable at M-System's web site.
To connect the module to a PC a dedicated cable is required (refer to M-System's web site or instruction manual).
• 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.

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 mm^2 (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 LonWorks 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: Σ
  Power factor: Σ
  Frequency
  Active energy: Incoming
  Reactive energy: Incoming

Status indicator LED: PWR

■ Recommended solderless terminal size - M3

3.3 (.13) max
6 (.24) max
mm (inch)

LonWorks COMMUNICATION

Neuron Chip: FT3150
(NeuronID printed in numbers and bar code [peel-off code 39 format])

Transceiver: FT-X1 (equivalent to FTT10A)
  Transmission speed: 78 kbps
  Twisted-pair cable
  Distance, free topology: 500 meters
  Max. 64 nodes/channel

LNS: Ver. 3.0 Service Pack 8 or higher

Status indicator: ONLINE, ERR, TX/RX, SVCE (service)

Operation switch: Service, reset

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

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 % continous, 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

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 - 9 999 999

Count at overflow: Reset and restart at '0.'

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 %
  Energy: ±2.0 % of the rating (range 5 - 100 %, PF 1)
  Frequency: ±0.1 % 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 and for 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 LonWorks or FG to input power)
1000 V AC @ 1 minute (current input or voltage input to discrete input)

EXTERNAL VIEW

■ BASIC MODULE
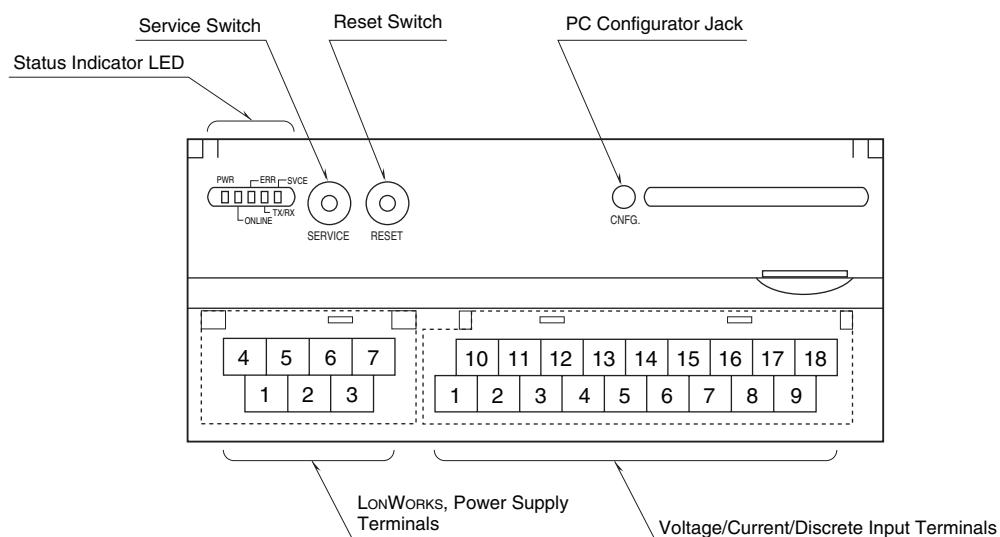
■ STATUS INDICATOR LED

ID	STATUS	COLOR	FUNCTION
PWR	ON	Green	Internal power 5V normal operating
	OFF		Internal power 5V abnormality
ONLINE	ON	Green	Online
	Blink ≈2 Hz		Wink message recived
	OFF		Abnormality
ERR	ON	Red	Writing in non-volatile memory
	Blink ≈ 0.5 Hz		No input or input overflow
	Blink ≈2 Hz		Abnormality
	OFF		Normal operating
TX/RX	ON	Green	In communication
	OFF		No connection
SVCE	ON	Green	Internal program error
	Blink ≈0.5 Hz		No network service
	OFF		Normal operating

■ EXTENSION MODULE

Discrete Input Terminals
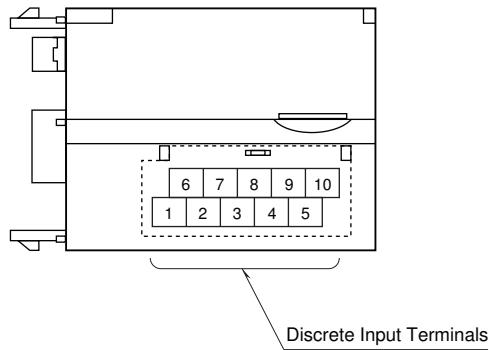
TERMINAL CONNECTIONS

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, LONWORKS TERMINAL ASSIGNMENT

4 NET1	5 NET2	6 U (+)	7 V (−)
1 NET1	2 NET2	3 FG	

NO.	ID	FUNCTION, NOTES
1	NET1	LONWORKS communication 1
2	NET2	LONWORKS communication 2
3	FG	FG
4	NET1	LONWORKS communication 1
5	NET2	LONWORKS communication 2
6	U (+)	Power input
7	V (−)	Power input

Note: LONWORKS wiring must be paired between NET1 terminals and/or NET2 terminals.

■ HOST PC CONNECTION
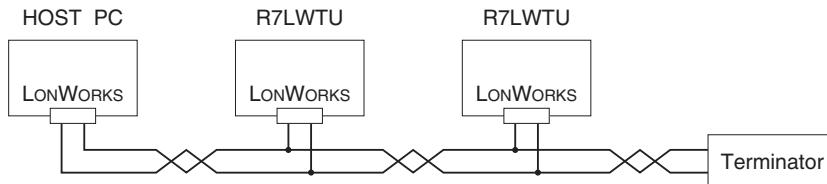
TERMINAL ASSIGNMENTS

■ BASIC MODULE

• 1 Circuit, 4 point discrete

10 P3	11 NC	12 NC	13 1ch 1K	14 1ch 2K	15 1ch 3K	16 DI1+	17 DI3+	18 COM
1 P1	2 P2	3 N	4 1ch 1L	5 1ch 2L	6 1ch 3L	7 DI2+	8 DI4+	9 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 P3	11 NC	12 NC	13 1ch 1K	14 1ch 2K	15 1ch 3K	16 2ch 1K	17 2ch 2K	18 2ch 3K
1 P1	2 P2	3 N	4 1ch 1L	5 1ch 2L	6 1ch 3L	7 2ch 1L	8 2ch 2L	9 2ch 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 COM	7 DI1+	8 DI3+	9 DI5+	10 DI7+
1 COM	2 DI2+	3 DI4+	4 DI6+	5 DI8+
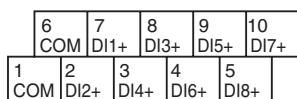
No.	ID	FUNCTION	No.	ID	FUNCTION
1	COM	Common	6	COM	Common
2	DI2 +	Discrete input 2	7	DI1 +	Discrete input 1
3	DI4 +	Discrete input 4	8	DI3 +	Discrete input 3
4	DI6 +	Discrete input 6	9	DI5 +	Discrete input 5
5	DI8 +	Discrete input 8	10	DI7 +	Discrete input 7

EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm (inch)

■ BASIC MODULE

7–M3 SCREW TERMINALS
for LONWORKS, Power

18–M3 SCREW TERMINALS
for Voltage, Current, Discrete Input

■ EXTENSION MODULES

10–M3 SCREW TERMINALS
for Discrete Input
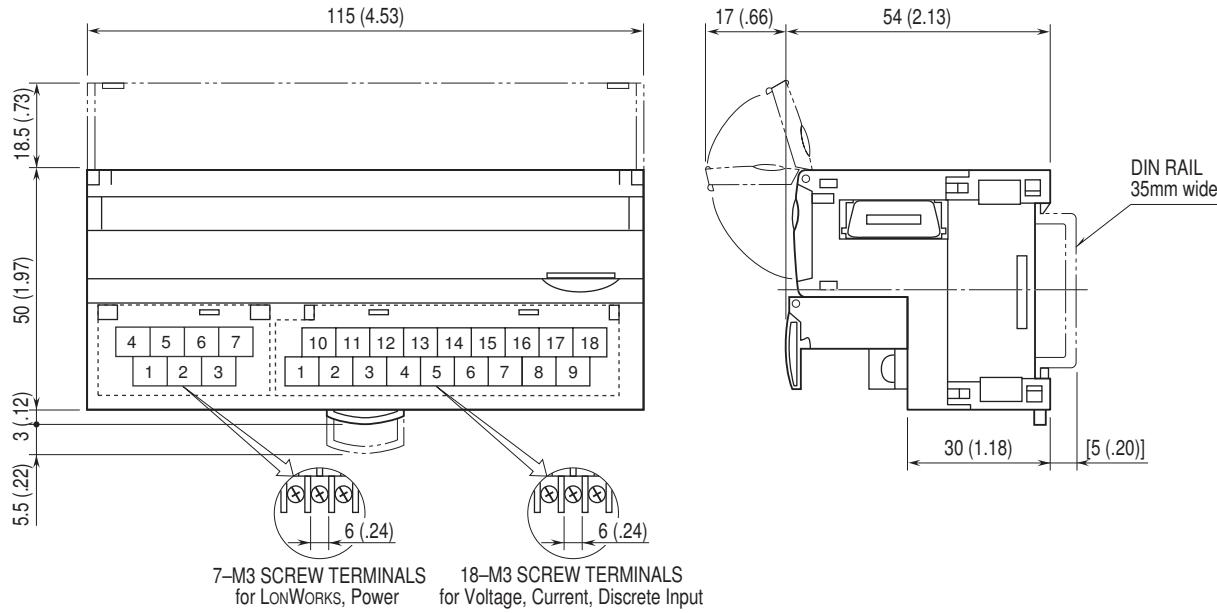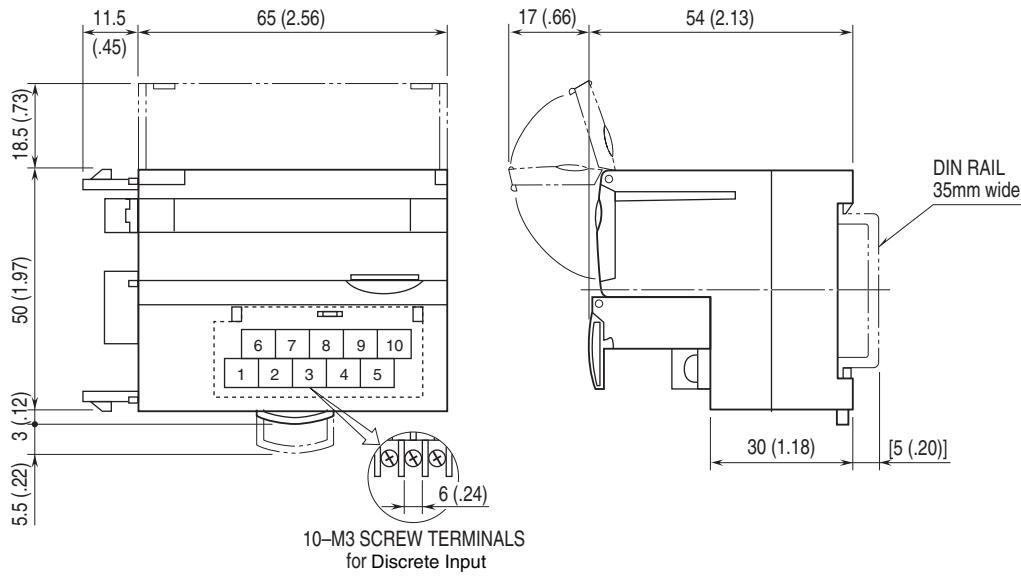
SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM

■ **BASIC MODULE**
• **1 Circuit, 4-point Discrete Inputs**

VOLTAGE INPUT
P1	1
P2	2
P3	10
N	3

NC | 11 |
NC | 12 |

CURRENT INPUT
1K	13
1L	4
2K	14
2L	5
3K	15
3L	6

DISCRETE INPUT
DI1+	16
DI2+	7
DI3+	17
DI4+	8
COM	18
COM	9

Isolation

Control Circuit

Comm. Circuit

4	NET1	LONWORKS
1	NET1	
5	NET2	LONWORKS
2	NET2	
3	FG
6	U (+)	POWER INPUT
7	V (−)	
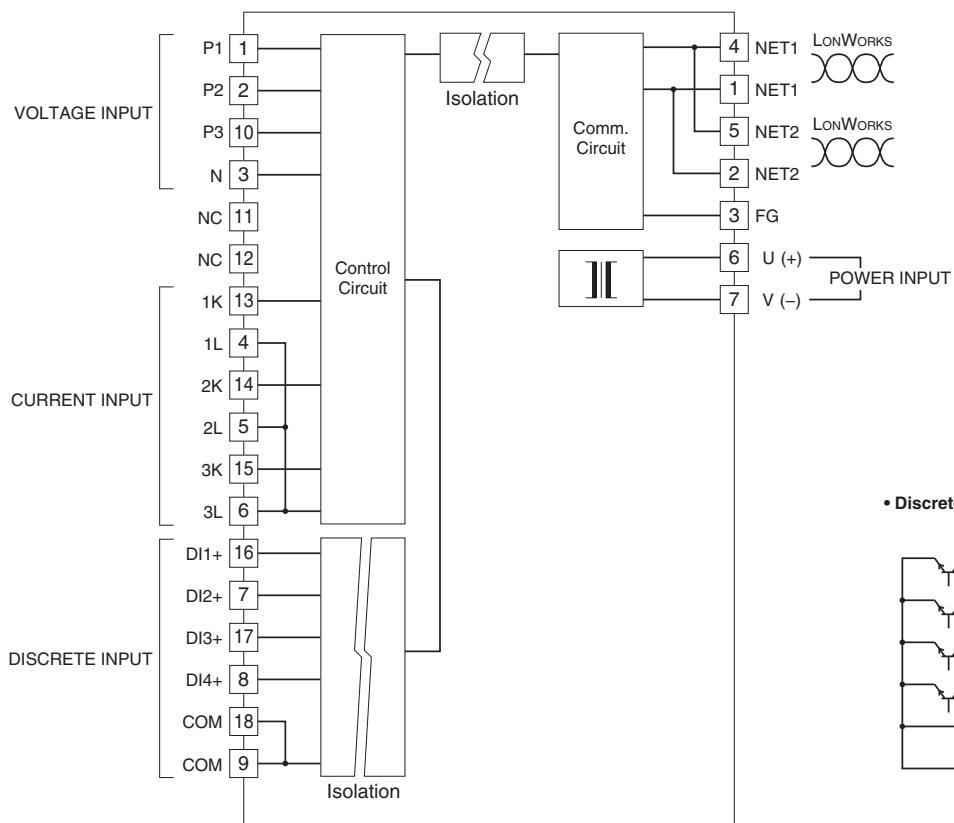
• **Discrete input connection e.g.**

| Di1+ |
| Di2+ |
| Di3+ |
| Di4+ |
| COM |
| COM |

• **2 Circuits**

VOLTAGE INPUT
P1	1
P2	2
P3	10
N	3

NC | 11 |
NC | 12 |

1 Ch. CURRENT INPUT
1K	13
1L	4
2K	14
2L	5
3K	15
3L	6

2 Ch. CURRENT INPUT
1K	16
1L	7
2K	17
2L	8
3K	18
3L	9

Isolation

Control Circuit

Comm. Circuit

EXTENSION CONNECTOR

4	NET1	LONWORKS
1	NET1	
5	NET2	LONWORKS
2	NET2	
3	FG
6	U (+)	POWER INPUT
7	V (−)	

■ **EXTENSION MODULE**

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

Input Circuit

Control Circuit

EXTENSION CONNECTOR
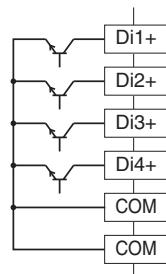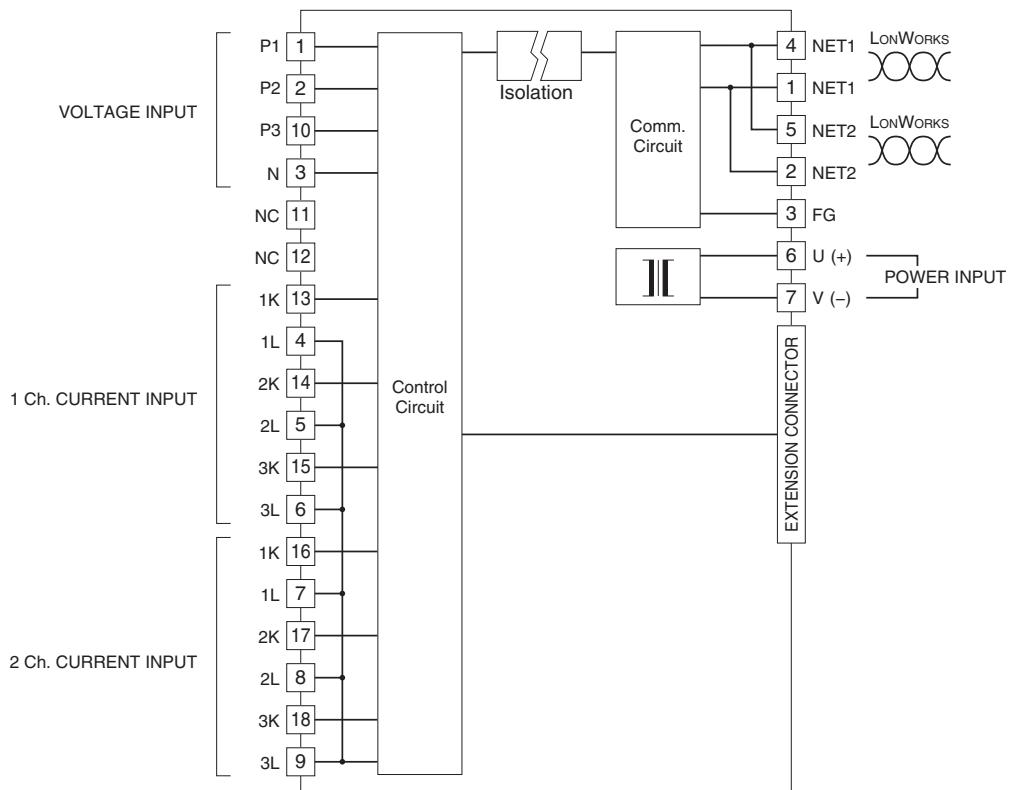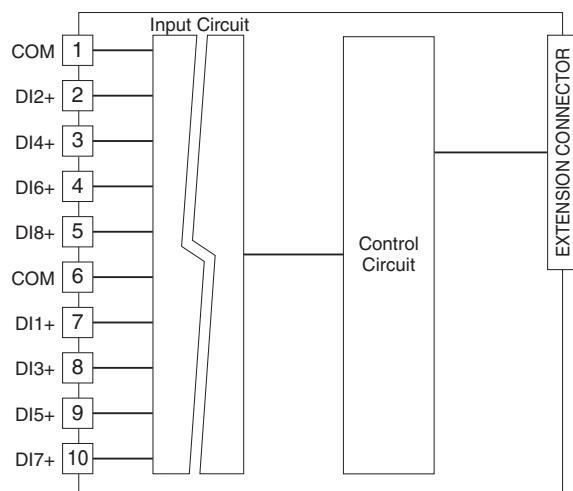
⚠ Specifications are subject to change without notice.