ICP DAS iWSN-9603 Series Wireless 3 Phase 2 Loop Intelligent Power Meter User Guide

Contents

ICP DAS iWSN-9603 Series Wireless 3 Phase 2 Loop Intelligent Power Meter

Product Information

Model Name	CT Type	IP Rating
iWSN-9603-160-ME-IP33	Split Core CT	IP33
iWSN-9603-RCT500P-ME-IP33	Rogowski Coil CT	IP33
iWSN-9603-240-ME-IP33	Split Core CT	IP33
iWSN-9603-RCT1000P-ME-IP33	Rogowski Coil CT	IP33
iWSN-9603-360-ME-IP33	Split Core CT	IP33
iWSN-9603-RCT2000P-ME-IP33	Rogowski Coil CT	IP33

Product Usage Instructions

Appearance

The module has the following components:

1. LED panel cover
2. LED indicators
3. Connector protector
4. CT wiring connector
5. Voltage input wiring connector

LED Indicators:

No.	Descriptions	Color
1	Power indicator (PWR)	Red
2	RF data transmission indicator (Tx)	Green
3	Error status indicator (Err)	Yellow

The meanings of the LED actions are described as follows:

- **Red LED is always OFF:** No power
- **Red LED is always ON**: Working power is given
- **Both Green and Yellow LEDs are ON**: The module is initializing
- **Both Green and Yellow flash 5 times per second**: Detecting hardware errors during initializing.
- **Green LED is always ON, Yellow LED flashes quickly and periodically:** Invalid Node ID (Node ID 0 is reserved, and can't be used)
- **Green and Yellow LEDs interactively flash 3 times afterwards turned ON simultaneously:** Detecting 50Hz AC frequency. The 60Hz won't have any indication.
- **Green and Yellow LEDs are OFF, afterwards, Green LED flashes depending on the Tx duty or while receiving an RF command:** The module has finished the initialization and starts to work.
- **Yellow LED flashes twice per second**: Detecting errors during operation.

DIP Switch & Trigger Button:

No.	Definitions	Descriptions
1	L	Switch for configuring the RF channel, Tx period, and AC wiring types.
2	R	Switch for configuring the Node ID, RF group ID, and the PA function.
3	Trigger Button	Button for forcing to transmit data once. Holding it for 5 seconds will reset the module.

The configurations and descriptions of L Switch and R Switch are as follows:

Items	RF Ch	Duty	Period	F1/F2	Wiring Type	Node ID (NID)	Group ID	PA
Descriptions	Up Down	Up Down	1 sec. 10 sec. 30 sec. 60 sec.	Up Down	Pin	Up Down	Up Down	Up Down
Pin	1 2 3 4				7	2 3 4 5		
Values	0-8				0-16			

Packing List
In addition to this guide, the package includes the following items

iWSN-9603 Series

Screw driver

Split Core CT

Rogowski Coil CT

4 M4*16L Mounting Screws

Note: The package of iWSN-9603-PCT-ME-IP33 doesn't include CTs, and the others are described below.

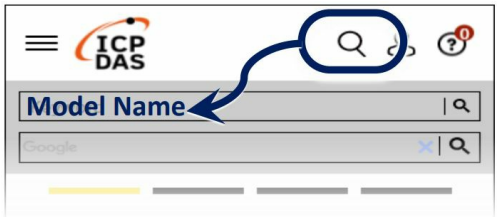
Model Name	iWSN-9603-160-ME-IP33 iWSN-9603-240-ME-IP33 iWSN-9603-360-ME-IP33	iWSN-9603-RCT500P-ME-IP33 iWSN-9603-RCT1000P-ME-IP33 iWSN-9603-RCT2000P-ME-IP33
Split Core CTs	6	None
Rogowski Coil CTs	None	6

Technical Support

- service@icpdas.com
- www.icpdas.com

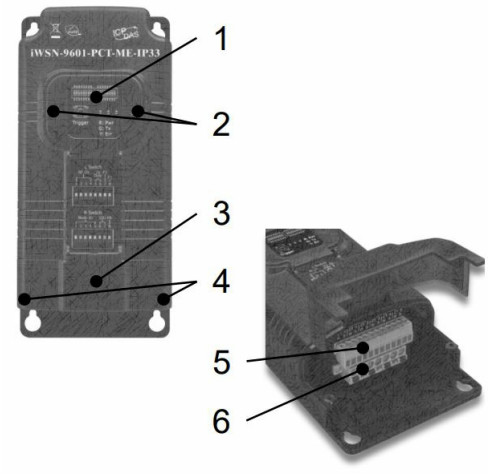
Resources
How to search for drivers, manuals, and spec information on the ICP DAS website.

- For Mobile Website



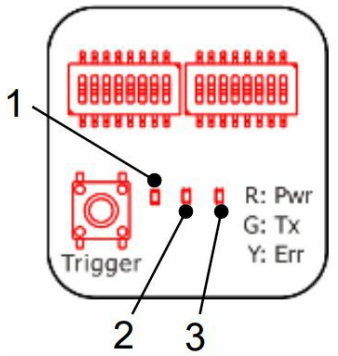
- For Desktop Website

Appearance



No.	Descriptions
1	LED panel cover. The LED statuses are shown here. Loosening two screws and opening the cover can configure th e module with the DIP switches and trigger buttons.
2	The screws for the LED panel cover.
3	Connector protector. Loosening two screws and opening the protector can wire the CTs and voltage input cables into the module.
4	The screws for the connector protector.
5	The connector for CT wiring
6	The connector for voltage input wiring

LED indicators



No.	Descriptions	Color
1	Power indicator (PWR)	Red
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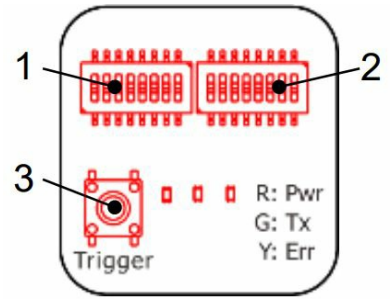
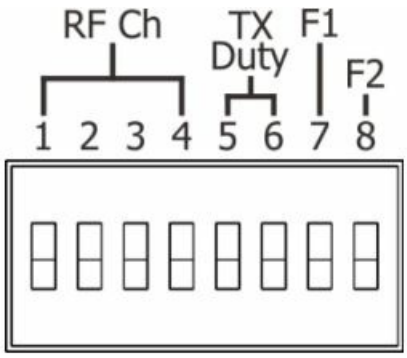
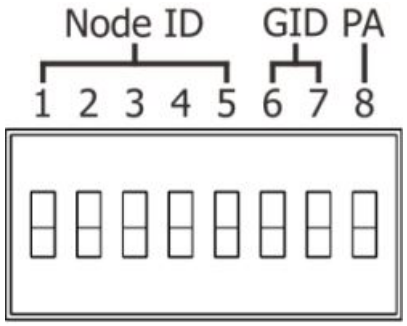
3	Error status indicator (Err)	Yellow

The meanings of the LED actions are described as follows.

LED Actions	Descriptions
Red LED is always OFF	No power
Red LED is always ON	Working power is given
Both Green and Yellow LEDs are ON	Module is initializing
Both Green and Yellow flash 5 times per second	Detecting hardware errors during initializing.
The green LED is always ON, Yellow LED flashes quickly and periodically.	Invalid Node ID (Node ID 0 is reserved, and can't be used)
Green and yellow LEDs interactively flash 3 times afterward turned ON simultaneously.	Detecting 50Hz AC frequency. The 60Hz won't have any indication.
Green and Yellow LEDs are OFF, afterwards Green LED flashes depended on the TX duty or while receiving an RF command.	The module has finished the initialization and started to work.
Yellow LED flashes twice per second	Detecting errors during operation.

DIP switch & trigger button



No.	Definitions	Descriptions
1		L Switch for configuring the RF channel, Tx period, and AC w iring types.
2		R Switch for configuring the Node ID, RF group ID, and the P A function.
3		Trigger button for forcing to transmit data once. Holding it 5 s econds will reset the module.

The Configurations and descriptions of L Switch and R Switch are as follows.

Items	Descriptions
RF Ch ■ : Up □ : Down	See table below
TX Duty ■ : Up □ : Down	See table below

Ch	Pin 1	2	3	4	Ch	Pin 1	2	3	4
0	□	□	□	□	8	□	□	□	■
1	■	□	□	□	9	■	□	□	■
2	□	■	□	□	A	□	■	□	■
3	■	■	□	□	B	■	■	□	■
4	□	□	■	□	C	□	□	■	■
5	■	□	■	□	D	■	□	■	■
6	□	■	■	□	E	□	■	■	■
7	■	■	■	□	F	■	■	■	■

Period	Pin 5	6
1 sec.	□	□
10 sec.	■	□
30 sec.	□	■
60 sec.	■	■

F1/F2

■ : Up
□ : Down

Wiring Type	Pin 7	Pin 8
3 Phase 4 Wire 3CT	□	□
3 Phase 3 Wire 3CT	■	□
Single Phase 2 Wire 1CT	□	■
3 Phase 3 wire 2CT / Single Phase 3 Wire 2CT	■	■

Node ID (NID)

■ : Up
□ : Down

NID	Pin 1	2	3	4	5	NID	Pin 1	2	3	4	5
0	□	□	□	□	□	16	□	□	□	□	■
1	■	□	□	□	□	17	■	□	□	□	■
2	□	■	□	□	□	18	□	■	□	□	■
3	■	■	□	□	□	19	■	■	□	□	■
4	□	□	■	□	□	20	□	□	■	□	■
5	■	□	■	□	□	21	■	□	■	□	■
6	□	■	■	□	□	22	□	■	■	□	■
7	■	■	■	□	□	23	■	■	■	□	■
8	□	□	□	■	□	24	□	□	□	■	■
9	■	□	□	■	□	25	■	□	□	■	■
10	□	■	□	■	□	26	□	■	□	■	■
11	■	■	□	■	□	27	■	■	□	■	■
12	□	□	■	■	□	28	□	□	■	■	■
13	■	□	■	■	□	29	■	□	■	■	■
14	□	■	■	■	□	30	□	■	■	■	■
15	■	■	■	■	□	31	■	■	■	■	■

Group ID

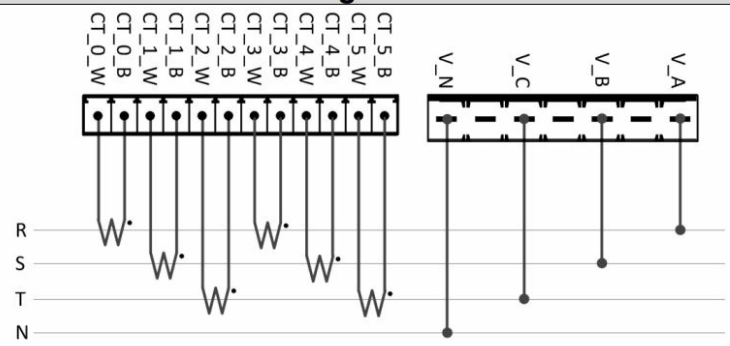
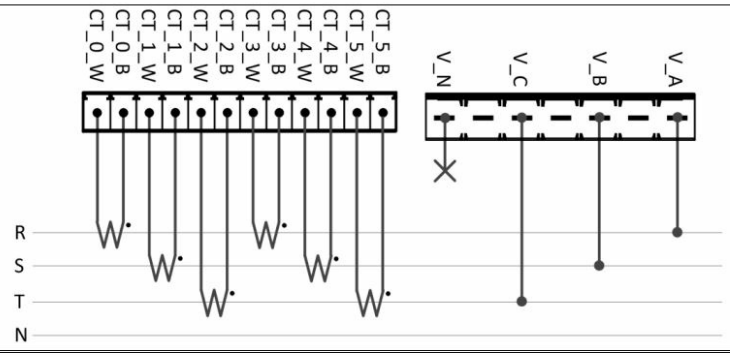
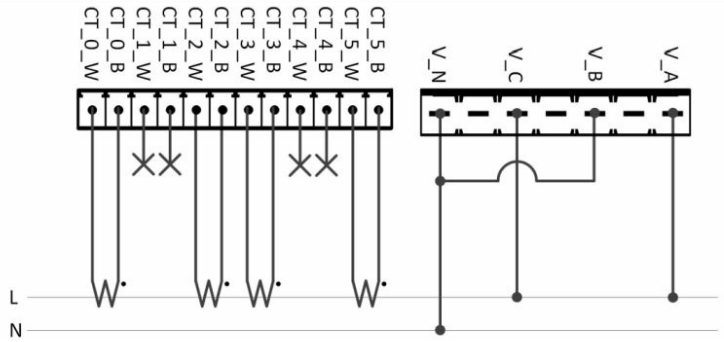
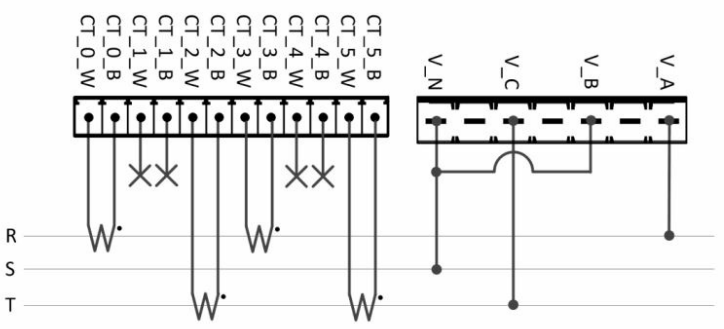
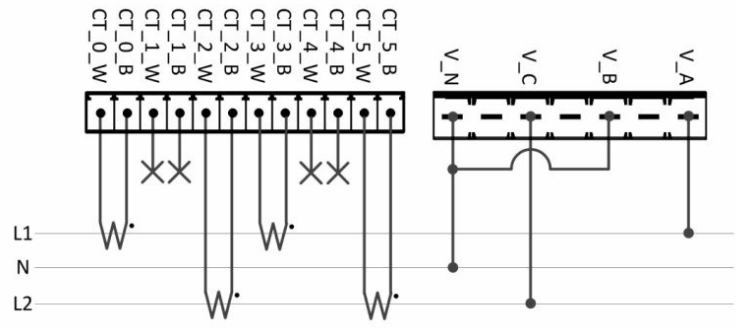
■ : Up
□ : Down

RF Group ID	Pin 6	Pin 7
0	□	□
1	■	□
2	□	■
3	■	■

PA

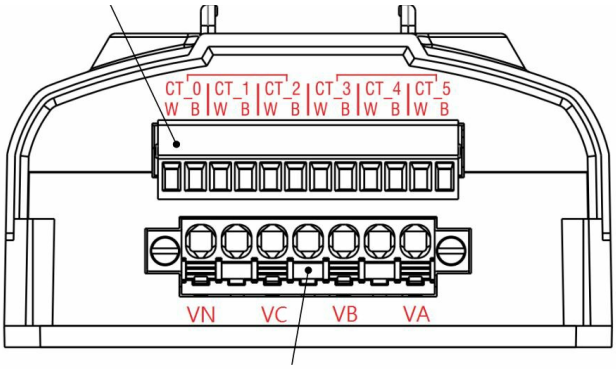
■ : Up
□ : Down

PA Function	Pin 8
Enable (only for factory test)	■
Disable	□

Wiring Types	Wiring Methods
3 Phase 4 Wire 3CT ■ : Up □ : Down Pin: 7 □ 8 □	
3 Phase 3 Wire 3CT ■ : Up □ : Down Pin: 7 ■ 8 □	
Single Phase 2 Wire 1CT ■ : Up □ : Down Pin: 7 □ 8 ■	
3 Phase 3 wire 2CT ■ : Up □ : Down Pin: 7 ■ 8 ■	
Wiring Types	**Wiring Methods**
Single Phase 3 Wire 2CT ■ : Up □ : Down Pin: 7 ■ 8 ■	

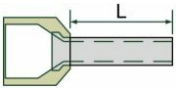
Pin assignments

CT input connector: The CT_0/1/ 2 and CT_3/4/5 are for two 3-phase AC circuits, which the pins marked with characters ‘W’ and ‘B’ are for wiring the white (or red) and black cables of the CT separately.



Voltage input connector: The pins VA/ VB/ VC/ VN are for the phase R/S/T/N of 3-phase power separately. Because the pins VA and VB are also for the working power, the iWSN-9603 series module can work normally only if the voltage between VA and VB is in the range of 100VAC – 480VAC.

When connecting the wire to CT and voltage input connectors, the twin cord end terminal must be used, and the dimensions are recommended in the table.

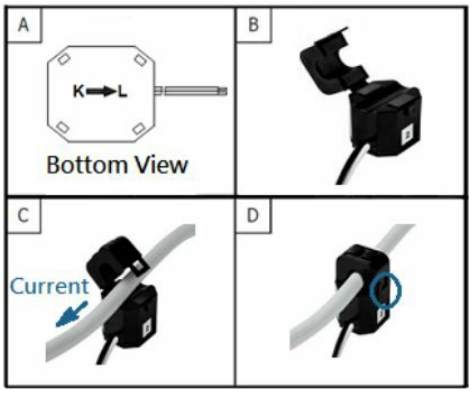


Connector Type	CT	Voltage
L (mm)	6 ~ 7	12 ~ 13

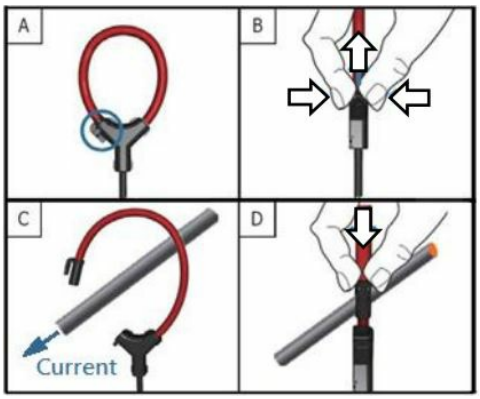
CT installation

KL on the bottom of split CT indicates the current direction. If the real current direction is different from the mark KL, the negative value of the power factor will be obtained. The Rogowski CT doesn't have the mark for the current direction; however, both the split and Rogowski CTs can fit the real current direction by following part C of the installation figure below. After finishing the CT installation, please confirm if the safety lock buckle of the CT is locked correctly.

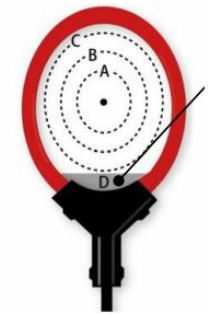
Split CT Installation



Rogowski CT Installation

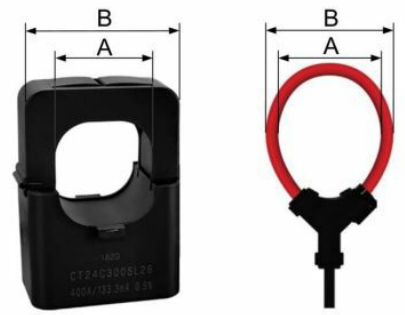


Besides the CT specification, the accuracy of Rogowski CT also depends on the location of the measured AC cable. Users must avoid putting the measured AC cable into zone D so that a smaller measurement error can be obtained.



Zone	**A**	**B**	**C**	**D**
Error	1%	3%	5%	>5%

The iWSN-9603 series modules can only be used with specific CTs. Only the model name iWSN-9603-PCT-ME-IP33 doesn't include CTs. Please check the accessories on the product website or contact the ICP DAS distributor to purchase the CTs for this model I f necessary. Different model name provides different size of CTs, These are described below.

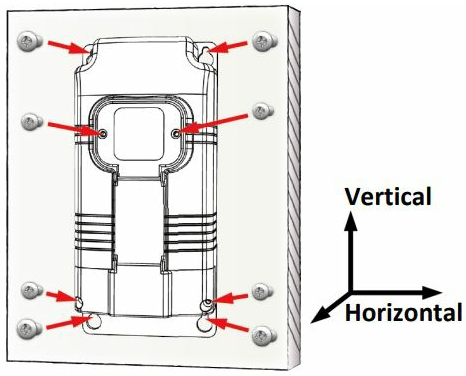


Unit: mm

Model Name	Type and Rating	Size A	Size B
iWSN-9603-PCT-ME-IP33	Split CT, Max. 400 A	–	–
iWSN-9603-160-ME-IP33	Split CT, 100 A	15.7	29
iWSN-9603-240-ME-IP33	Split CT, 200 A	23.6	45.2
iWSN-9603-360-ME-IP33	Split CT, 400 A	35.7	57.5
iWSN-9603-RCT500P-ME-IP33	Rogowski CT, 500 A	55	68.5
iWSN-9603-RCT1000P-ME-IP33	Rogowski CT, 500 A	80	93.5
iWSN-9603-RCT2000P-ME-IP33	Rogowski CT, 500 A	105	118.5

Module Installation

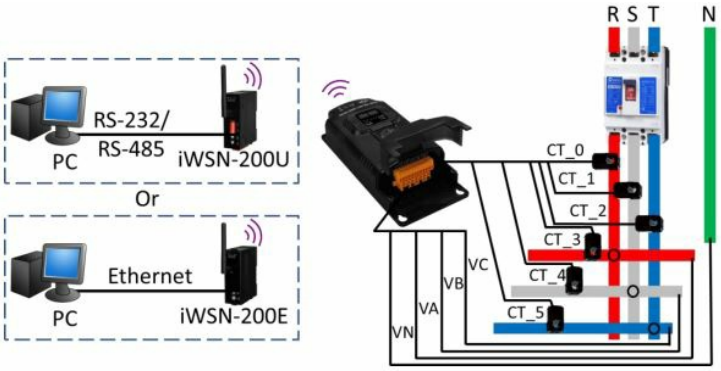
The iWSN-9603 series provides the IP33 rating enclosure which can effectively prevent the modules from the influence of the fire sprinkler systems. Users need to install the module vertically andscrews up the LED panel cover and connector protector properly to guarantee the IP33 rating performance.



Operations

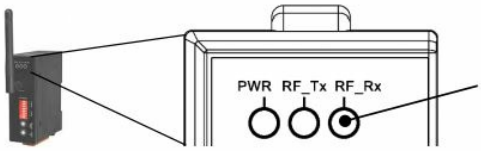
Users can prepare a PC and iWSN-200U (or iWSN-200E) for data collection of iWSN-9603 series modules.

1. Configure the RF channel and Group ID of iWSN-200U/E to the same configuration of the iWSN-9603 series modules.
2. Set the Node ID (1 ~ 31), wiring type, and Tx duty, and finish the wiring connection. The Node ID must be unique in a sub-network (the same RF channel and group ID). The architecture, for example, may be as follows.



3. Turn ON the iWSN-200U/E and iWSN-9603 series modules to start the data collection. The RF_Rx LED of the iWSN-200U/E flashing once indicates the iWSN-200U/E has received one message from the iWSN-9603 series module.

- The flash of RF_Rx LED indicates the iWSN-200U/E gets the data from the iWSN-9603 series module



4. Users can use the PC with iWSN Utility to get the data or directly access the iWSN-200U/E registers via Modbus RTU/TCP protocol, about the definitions of the Modbus register please refer to the iWSN-200U/E user manual.

Product Specifications

Model Name	**iWSN-9603-PCT -ME-IP33**	**iWSN-9603-160 -ME-IP33 iWSN-9603-240 -ME-IP33 iWSN-9603-360 -ME-IP33**	**iWSN-9603-RCT500P -ME-IP33 iWSN-9603-RCT1000P -ME-IP33 iWSN-9603-RCT2000P -ME-IP33**
EMS Protection			
EFT(IEC 61000-4-4)	+/- 500 V		
ESD(IEC 61000-4-2)	+/- 4 kV Contact		
LED Indicators			
Status	1 for Power, 1 for Tx, and 1 for Error		
AC Power Measurement			
Wiring	3P4W-3CT, 3P3W-2CT, 3P3W-3CT, 1P2W-1CT, 1P3W-2CT		
Loops	4 (Single phase) / 2 (Three phase)		
Input Voltage	Three phase 4 wire x1, 100 – 480 VAC (58 – 277 VAC single phase)		
Input Current	Max. 400 A	-160: Max. 100 A -240: Max. 200 A -360: Max. 400 A	-RCT500P: Max. 500 A -RCT1000P: Max. 1000 A -RCT2000P: Max 2000 A
Input Frequency	50/60 Hz		
Why Accuracy (PF=1)	Better than 2%	Better than 1%	Better than 1%
Power Parameter Measurement	True RMS voltage (Vrms), True RMS current (Irms), Active Power (kW), Active Energy (kWh), Power Factor (PF), Frequency, and timestamp (YYYY/MM/DD HH:MM: SS)		

Categories	CAT III
Data Update Rate	1, 10, 30, or 60 seconds
Antenna	
Type	Built-in Omni-directional antenna
Power	
Consumption	3 W

Input Type	Three phase 100 – 480 VAC (58 – 277 VAC single phase)		
CT			
Includes CTs	0 (*Note)	6	
CT Type	Split core CT		Rogowski CT
Max. Current	Depends on the selection (Max. 400 A)	-160: Max. 100 A -240: Max. 200 A -360: Max. 400 A	-RCT500P: Max. 500 A -RCT1000P: Max. 1000 A -RCT2000P: Max 2000 A
Inside Diameter	Depending on the selection (Max. 36 mm)	-160: 16 mm -240: 24 mm -360: 36 mm	-RCT500P: 50 mm -RCT1000P: 85 mm -RCT2000P: 105 mm
Leading Cable	8 m		4 m
RF			
Channels	0 ~ 15		
Group ID	0 ~ 3		
Radio Frequency	433.1000 ~ 434.6000 MHz		
Transmission Power	9±1 dBm (Typical)		
Transmission Distance (LoS)	100 m		
Node ID	1 ~ 31		
Working Duty	1, 10, 30, or 60 seconds		
Mechanical			
Dimensions (mm)	85 x 184 x 47 (W x L x H)		
Installation	Wall-mount		
Ingress Protection Rating	IP33		
Environment			
Operating Temper.	-30 °C ~ +50 °C		
Storage Temper.	-40 °C ~ +55 °C		
Humidity	10 ~ 90% RH, Non-condensing		
Altitude	Max. 2000 m		

Note: Please check the accessories on the product website or contact the ICP DAS distributor to purchase the CTs for this model if necessary.

Caution

Danger
The meter contains hazardous voltages, and should never be disassembled. Failing to follow this practice will result in serious injury or death. Any work on or near energized meters, meter sockets, or other metering equipment could induce a danger of electrical shock. It is strongly recommended that all work should be performed only by qualified industrial electricians and metering specialists. ICP DAS assumes no responsibility if your electrical installer does not follow the appropriate national and local electrical codes.

Warning
ICP DAS assumes no liability for any damage resulting from the use of this product. ICP DAS reserves the right to change this manual at any time without notice. The information furnished by ICP DAS is believed to be accurate and reliable. However, no responsibility is assumed by ICP DAS for its use, not for any infringements of patents or other rights of third parties resulting from its use.

Product Warranty & Customer Support
ICP DAS warrants all products free from defects in material and workmanship for one year from the date of shipping. During the warranty period, we will, at our position, either repair or replace any product that proves to be defective. To report any defect, please contact +886-3- 597-3366 or **service@icpdas.com.** Please have the model name, serial number, and a detailed problem description available when you call. If the problem concerns a particular reading, please have all meter readings available. When returning any merchandise to ICP DAS, a return SN is required.

Documents / Resources

	**ICP DAS iWSN-9603 Series Wireless 3 Phase 2 Loop Intelligent Power Meter** [pdf] User Guide iWSN-9603-160-ME-IP33, iWSN-9603-RCT500P-ME-IP33, iWSN-9603-240-ME-IP33, iWSN-9603-RCT1000P-ME-IP33, iWSN-9603-360-ME-IP33, iWSN-9603-RCT2000P-ME-IP33, iWSN-9603 Series Wireless 3 Phase 2 Loop Intelligent Power Meter, Wireless 3 Phase 2 Loop Intelligent Power Meter, 3 Phase 2 Loop Intelligent Power Meter, Intelligent Power Meter, Power Meter

References

- ICP DAS
- ICP DAS