

User manual

Ver 1.3

Change history

| revision | Updated date | summary |
|----------|--------------|-------------------------------------|
| 1.0 | Feb 15 2013 | First edition |
| 1.1 | Feb 22.2013 | correction of erroneous description |
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| | | |

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1. Application

This document shows the description of wattmeter (hereinafter called **meter**) and mounted communication board (hereinafter called **module**).

- target meters : GE I210+ Meter FM1S / FM2S / FM12S / FM25S
- Module : Fujitsu WR-2012-00a-MM

2. System Configuration

Fig2-1 is general system configuration of using meter.

Installed meters in each house is communicated to Center via Relay equipments and Concentrators and control the meter-reading value etc. automatically.

Red line of Fig.2-1 is the applicable scope of this document.

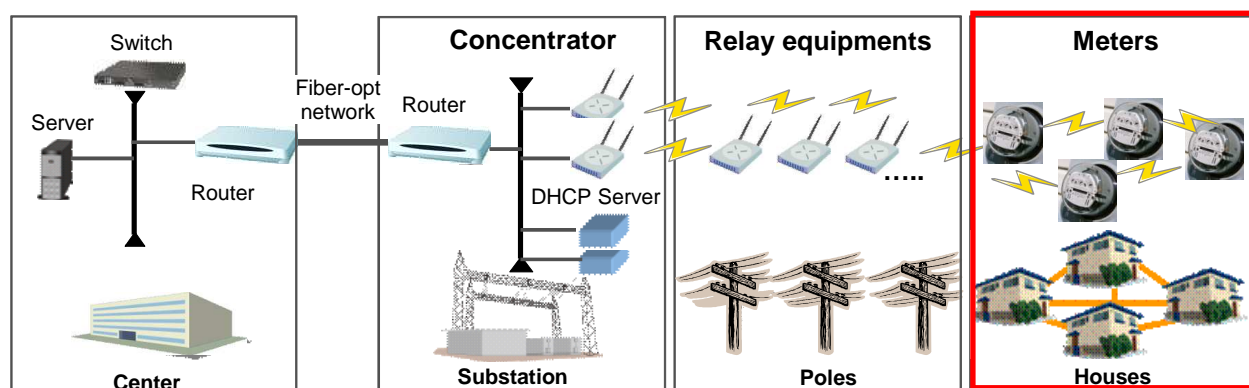


Fig2-1 System configuration

3. Description of Meter (Host)

3.1 Overview

Form and overview of meter are as follows.

| Category | Meter form | | | | Remark |
|-----------------------|----------------|--------|---------------------|---------------------|--------|
| | FM1S | FM2S | FM12S | FM25S | |
| Input voltage | 120VAC | 240VAC | 120VAC or 240VAC | 120VAC or 240VAC | |
| enclosure | Same form | | | | |
| Meter panel board | Same board | | | | |
| Meter socket type | Different type | | | | |
| Mouted module | Same module | | | | |
| meter panel interface | Same interface | | | | |
| AC power cable | Same cable | | | | |

3.2 Operating Range

- Voltage : + - 20% (or $\pm 20\%$)
- Temperature : -40°C through +85°C
- Typical Starting Watts : ≤ 5.0 Watts (Form 2S 240V CL200)
- Typical Watts Loss : 0.7 Watts
- Typical Accuracy : Within +/- 0.2%

4. Description of Module (Module)

4.1 Overview

The module mounted to each meter in paragraph 3 collects the meter-reading values etc. with controlling Center.

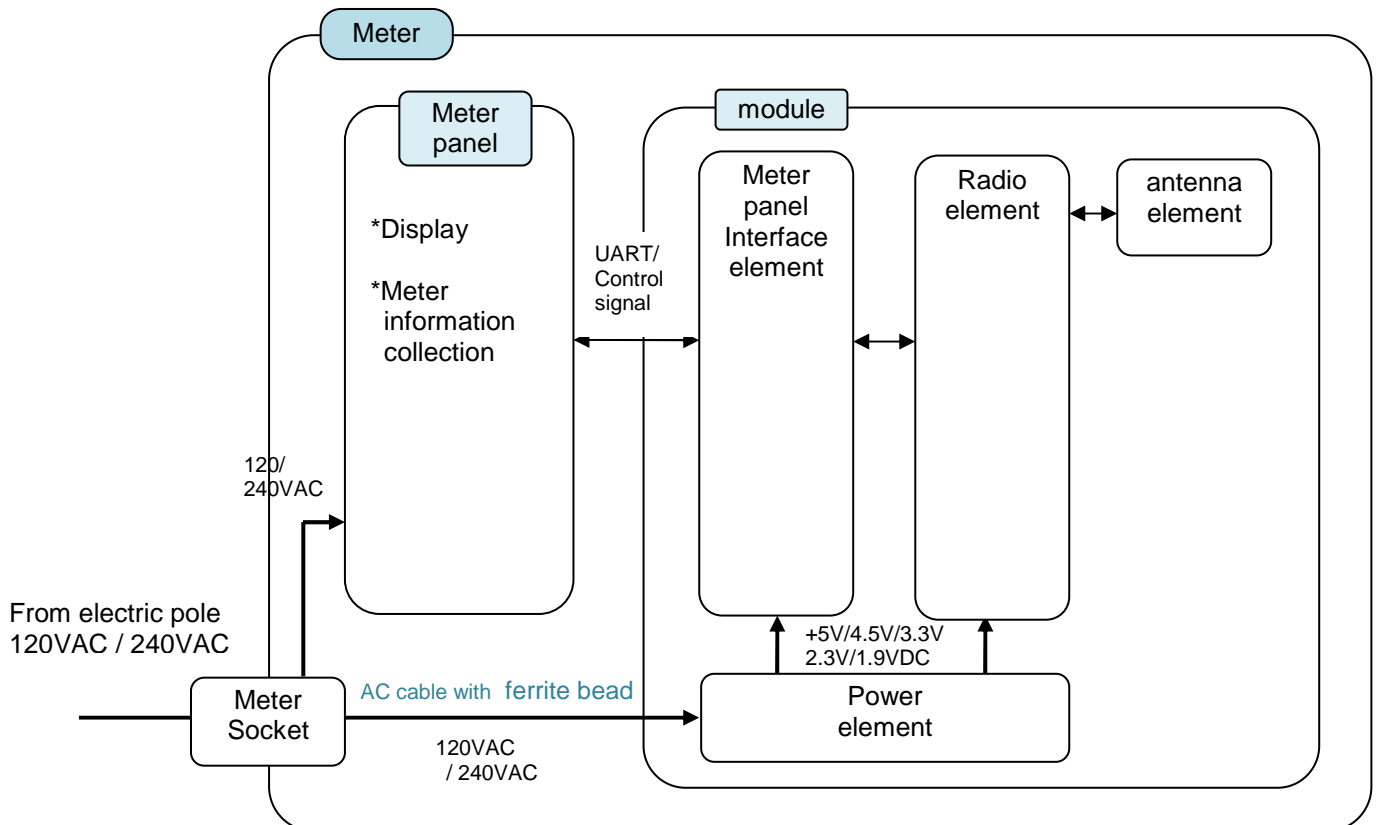
4.2 Operating Range

Same as chapter 3.2.

4.3 Major element

Major elements of module are as follows.

| No. | component | summary | remark | |
|-----|-------------------------------|--|-----------------------------------|------------|
| 1 | Radio element | IEEE802. 11b Transmission power:100mW Modulation: DSSS / BPSK Data rate : 1Mbps | | |
| 2 | Antenna | This antenna made by printed-circuit in the module. | | |
| 3 | Meter panel interface element | Communication between Meter panel. Signals:refer to chapter 3.2 | | |
| 4 | Power element | *AC cable(with ferrite bead) is connected to this element. *This element steps down AC input(120V/240V) to +5V/4.5V/3.3V/2.3V/1.9VDC. | | |
| 5 | Dispray element | extinction | power off or normal operation | LED(green) |
| | | blinking | No operation (start-up firmware) | |
| | | lighting | No operation(reset / no service) | |
| | | extinction | normal | LED(red) |
| | | blinking | fault | |
| | | lighting | reset | |



4.4 Basic specification 【module】

| No | Item | | specification |
|----|----------------------------|-----------------------|--|
| 1 | External interface | Wireless | IEEE802.11b |
| | | Meter Panel | Connector(10pin) |
| | | Power | Input : AC85~264V |
| 2 | Debug interface | RESET | FRES1/2 Short-circuit |
| | | MB86C90 | JTAG:×1 |
| | | AR2315 | JTAG:×1 |
| 3 | Display | LED | Status :GREEN |
| | | | Alarm :AMBER |
| 4 | Security | Tamper | Program Deletion |
| 5 | Power | Input | AC-DC Conversion (120V/240V⇒+5V/4.5V/3.3V/2.3V/1.9VDC) |
| | | Frequency | 50/60Hz |
| | | consumption | Input :less than 16.92W(120VAC) / 20.64W(240VAC) Output: •5 V:less than 4.35W •2.3V:less than 1.15W •1.9V:less than 0.95W •3.3V:less than 1.35W |
| 6 | Condition | Operating temperature | -20°C~40°C |
| 7 | Cooling method | | Air cooling without blower |
| 8 | Lightning surge protection | | varistor |

5. Required FCC and IC statement (Host)

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) this device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

5.1 FCC §15.21

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

5.2 FCC §15.105

For class B equipment:

NOTE:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

5.3 RSS-Gen §7.1.2.

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante.

5.4 RSS-Gen §7.1.3.

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions:

- (1) this device may not cause interference, and
- (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

- (1) l'appareil ne doit pas produire de brouillage, et
- (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

5.5 Indicating safe separation distance warning

This equipment complies with radio frequency exposure limits set forth by the FCC and Industry Canada for an uncontrolled environment. This equipment should be installed and operated with a Minimum distance of 20cm between the device and the user or bystanders. This device must Not be co-located or operating in conjunction with any other antenna or transmitter.

Cet équipement est conforme aux limites d'exposition aux radiofréquences définies par la FCC et Industrie Canada pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec un minimum de 20 cm de distance entre le dispositif et l'utilisateur ou des tiers. Ce dispositif ne doit pas être utilisé a proximité d'une autre antenne ou d'un autre émetteur.

5.6 Indicating compliance with ICES-003

"This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme a la norme NMB-003 du Canada."

"CAN ICES-3 (B) / NMB-3 (B)".

6. Required FCC and IC statement (Module)

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