How to Interpret the Displayed Data

This guide explains how to read and understand the data displayed by the **Micro-Meter system** on its web or cloud dashboard. The system uses a **LoRaWAN wireless network** to send measurements (voltage, current, power, energy, etc.) from the field device to the cloud. Because LoRaWAN uses long-range wireless communication, there can sometimes be small transmission delays, which are normal.

1. Understanding the Different Views

A. Summary View

- Shows key readings for each timestamp.
- Each timestamp may be off by up to **6 seconds** due to sampling timing.
- You can select your preferred **reporting interval** (for example, every 5, 15, or 30 minutes) in the **Edit Page** settings.

B. Table View

- Displays data at **5-minute intervals**.
- The most recent record may not yet be fully populated because not all readings have been received from the device.
- To see complete data, click on **older records**.
- If you choose a longer reporting interval (e.g., 15 or 30 minutes), you may see many empty fields — this is normal because data is still collected every 5 minutes.
    - Example: if your reporting interval is 15 minutes, data will appear every **3 records** (since each record represents 5 minutes).

C. Demand Cumulative View

- Always displays data in **15-minute blocks**, regardless of the interval you select.
- Each block shows **average and cumulative values** for that 15-minute period.

- This view is useful for identifying energy demand peaks and usage patterns.

2. Why Some Data May Appear Missing

The Micro-Meter sends its data through the **LoRaWAN network**, which can experience small **delays (latency)** or **data queuing** when traffic is heavy.

If some readings arrive late, they are automatically inserted into the next record. Therefore, to ensure you see all data, it's a good practice to **step through previous records**.

3. Understanding Each Measurement

Parameter	Meaning	How It's Measured
Power Factor (PF)	Measures how efficiently electrical power is being used. A PF close to 1 means good efficiency.	Sampled every **6 seconds**; only the most recent sample is displayed.
Voltage (V, RMS)	Shows the root-mean-square (RMS) voltage of each phase.	Sampled every **6 seconds**; last sample before transmission is shown.
Current (A, RMS)	RMS current for each phase.	Sampled every **6 seconds**; last sample is shown.
Peak Current (A, RMS)	The highest RMS current recorded over a 5-minute window.	Sampled every **1 second**; the highest value out of 300 samples (5 min × 60 s) is sent. The Peak Current is always transmitted every 5 minutes.
CPU Temperature	Internal temperature of the Micro-Meter's processor (not room temperature).	Monitors for overheating in hot environments.
Active Interval Energy F (kWh)	Total accumulated energy use, similar to a utility meter or vehicle odometer — it always increases and cannot be reset.	Starts counting as soon as the meter is powered, even during factory testing.

Active Interval F Diff (kWh)	The difference between the current and previous reading — shows energy consumed during that specific interval.	For a 3-phase system, total energy = sum of the three phases: **Etotal = E1 + E2 + E3**
Active Power (W)	Instantaneous real power in watts.	Sampled every **6 seconds**; last sample before transmission is displayed.
Active Demand Power (WD)	Average real power (Watts-Demand) over a 15-minute period — standard for utilities such as SCE.	150 readings (every 6 seconds for 15 min) are averaged. The value displayed is for the **previous 15-minute block**.
Reactive Energy L (kVARh)	Inductive reactive energy from loads like motors and HVAC. Works like an odometer — continuously increases.	Measured cumulatively and cannot be reset.
Reactive Energy C (kVARh)	Capacitive reactive energy from capacitors or batteries. Works like an odometer.	Also cumulative and non-resettable.

4. LoRaWAN Gateway Information

- The **gateway name** used to send the data appears in the display.
- If multiple gateways are in range, their names may appear as well.

What is a LoRaWAN Gateway?

A **LoRaWAN gateway** is a bridge between the Micro-Meter (end device) and the internet.
It:

- Receives LoRa radio packets from Micro-Meters.
- Forwards them via Ethernet, Wi-Fi, or cellular to a **cloud server** (for example, AWS).

There are two main types of networks:

- **Private LoRaWAN network:** uses your own gateways supplied by CWS (indoor or outdoor).
- **Public LoRaWAN network:** shared by many users, managed by a carrier. Your Micro-Meter can join one if it’s registered and within range.

5. Demand Cumulative View – Details

This view provides the most utility-like display of total and demand energy data.

Parameter	Description
Active Cumulative Energy F / R	Shows continuously increasing energy totals (forward and reverse). To find actual energy used, subtract the previous reading from the current reading.
Active Demand Power	Average real power over a 15-minute block.
Reactive Cumulative Energy L / C	Continuous totals for inductive and capacitive reactive energy. Use differences between blocks to find actual consumption.
Reactive Demand Power	Average reactive power over a 15-minute block.
Peak Demand Power	The highest 15-minute demand power value of the day (since midnight).
Peak Demand Power Time	Timestamp of when the peak demand occurred.

6. Summary

- **Data intervals:** Summary and Table views depend on the user's interval setting, but Peak Current and Demand Power always follow fixed timing (5 or 15 minutes).
- **Sampling:** Most parameters are sampled every 6 seconds; only the last sample before transmission is displayed.
- **Cumulative meters:** Energy readings work like odometers and cannot be reset.
- **LoRaWAN delay:** Occasional gaps or slight timestamp offsets are normal due to network latency.
- **Gateway role:** Transfers data between the Micro-Meter and the cloud — may be CWS-supplied or public network.