MMUs or Multipoint Meters?

FOREWORD:

In addition to single point metering in the submetering world, there are options for metering multiple tenants and multiple circuits. The MMU (**M**ultiple **M**etering **U**nit) and the Multipoint meter are intended to be used in these applications. There are some differences between these devices and the following information will, hopefully, make choosing one or the other an easier task for any particular application.

MMU:

The Multiple Metering Unit is basically what it is named; multiple submeters are supplied in a common enclosure which is designed to be more compact and require less time to install than the equivalent number of single meters. The voltage circuits to each meter are typically already pre-wired and only require one power circuit to energize all of the meters.

The number of meters can be anywhere from 2 to 24 units in each MMU. These can be single or 3-Phase meters. The format allows 2 to 24 tenants to be metered or it is possible to monitor up to 72 individual circuits with a 24 unit, 3-Phase MMU.

MMU ADVANTAGES:

- An MMU can be built with different voltage meters in it. These allows multiple types of services and/or distribution networks to be monitored in one enclosure.
- In case of a meter failure, only one input component has to be replaced. This allows all of the other metering points to continue functioning – preventing income/data loss where billing is concerned. *Single meter replacement cost is considerably lower than whole unit replacement.*
- Individual meters can be added to the enclosure as tenants are acquired, making initial product cost possibly lower by requiring only meters to cover the present tenants.
- Multiple voltages/service types allow all tenant power systems to be accounted for.
- Individual meter displays are available.
- Meters come with the proper amp rating – no field commissioning required.

MMU DISADVANTAGES:

- Enclosure might require larger mounting space.

- Initial cost for a full complement unit might be higher.
- MMUs must be mounted outside the electrical panel.

MULTIPOINT METER:

The Multipoint meter is a unit that consists of a large metering circuit board that is designed to monitor multiple individual breakers or circuits. The circuits can be accounted for individually or combined to account for a single tenant. Most Multipoint meters are designed to cover one type of voltage or service.

Some Multipoint meters are modular and can be expanded to account for more individual circuits. Typical expansion can allow 48 circuits, and, in some cases, up to 60 circuits. A single display is usually utilized to provide data on the individual circuits or tenants.

MULTIPOINT METER ADVANTAGES:

- Reduced space needed for installation.
- Possible lower initial cost for initial full complement of inputs.
- Each input point can be assigned an amp rating (based on CT size).
- Input modules can be added in some products; for future expansion.
- Some units can be mounted inside the electrical panel.

MULTIPOINT METER DISADVANTAGES:

- If the main meter module fails, all inputs will not function.
- Higher cost to replace failed main meter module.
- Loss of all billing/data points if main meter module fails.
- Initial installation requires commissioning by manufacturer or third party.

CTs (Current Transformers):

Remote mounted CTs are used to provide both MMU and Multipoint meters with the information on the amount of current (amps) used by the conductors that they are monitoring. They can be solid core, split core, or Rogowski Coil (“rope”) type. CTs ranging from 25 to 4000+ amps are available for use with the meters. Depending on the meters, CTs with 80 and 100 mA output, 5 A output, and 0.333 to 2 Volt output can be used in submeter installations.

Typically, submeter installations use either low voltage or mA output type CTs for their installation. Current Transformers meeting UL2808 standards are designed to prevent possible hazardous voltage conditions if their secondary wiring is not connected to the meters or a shorting block.

SOLID CORE CTs:

Solid core CTs are designed as a one piece unit and have to be mounted by disconnecting the conductor(s) to be disconnected so the CT can be installed around them. Especially in this case, as well as other types of CTs, the power must be off. After installation, the conductor(s) can be energized again after the CTs are connected to the meter or shorting block.

Solid core CTs are typically used when billing is part of the installation and the best accuracy is required from the installation. Solid core CTs are typically less expensive than split core or "rope" style units.

SPLIT CORE CTs:

Split Core CTs are designed to open up so that they can be installed without disconnecting the conductor(s) that they are to be monitoring. As such, they can be installed more quickly/easily than the solid core types. It is important, for safety, that the power is turned off for the installation, even though the conductors remain connected.

Split Core CTs are typically utilized when billing is not the purpose for metering, although certain units may be accurate enough. They also are better applied when the amps of the monitored circuits are above 400.

ROPE (*ROGOWSKI COIL*) CTs:

"Rope" CTs are designed to be flexible so they can be installed around multiple conductors or installations that might be difficult to monitor with other types. Unlike standard CTs, they don't use an iron core in their design. This makes them lighter than standard CTs and makes their weight an advantage – especially in large amp designs.

Because of their design, rope style CTs require a power supply in order to function. While there are a few meters that are designed to power them, most applications will call for a separate (external) power supply in order to utilize Rope CTs*. It is essential that the power supply remains on in order to meter properly.*

COMMUNICATION:

Today there are many choices in communication from both MMU and Multipoint type submeters. The best option for each installation depends on the facility and its design. The good news is that there is an option that likely will fit most possible scenarios. The following list will provide a brief look at some of the available options.

- RS485 is a hardwired communication from the meters. It can be used for "daisy chaining" many meters with up to 4,000 feet of total wiring. It supports both proprietary and open protocols (Modbus, BACnet, etc.). Multiple 4,00 foot runs can be utilized if the installation requires it. If security is of concern, RS485 would be a choice.
- ETHERNET is another hardwire media that is available for communication. In cases where it is already in the facility, this is a possibility. However, unlike a dedicated RS485 system, other data is likely being transmitted over ETHERNET and it does not provide the same security that RS485 does.
- WIFI (wireless) is available from some meter manufacturers and can provide a means of communication in buildings that have a facility wide network.
- RF (radio wireless) provides a means of communication when it is impractical to utilize a hardwired system. Utilizing 900 MHz systems will provide better communication capability through walls, etc. If the distance between transceivers is too great, repeaters can be used to fill in the gap. Multiple protocols are available with RF communication. Some metering systems can provide power to the transceivers and some require an outside source to power the transceivers. Battery powered RF units are available if needed. However, batteries should be replaced according to usage and manufacturers' suggested intervals to avoid loss of data.
- MODEMs, both cellular and phone network, are available as well. Although not as common as other communication methods today, this provides another choice.
- "SNEAKER READS" is a term that describes simply walking up to a meter and taking a reading from its display. This "original" meter reading method in not often used any more, but it does provide an alternative for those without a communication system.

SUMMARY:

Both MMU and Multipoint meters have advantages and disadvantages. The users will have to determine which methodology best fills their needs. Installation time is about the same for either. The possibly higher initial cost for an MMU could be mitigated by its lower billing/data loss with a meter failure. The Multipoint meter might be important for its possible lower initial cost or size advantage. The choice is up to the user and, hopefully, this document will provide the necessary data for making that choice.

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