

Gas 1st Smart Meter Installations

Guidance Notes – Recommended Practices

1. Introduction

In order to support the Government mandated smart meter roll out gas suppliers may want to install their gas smart metering system independently from the installation of the electricity smart meter, where customers are supplied by different energy suppliers.

Suppliers have been in discussion with manufacturers regarding options for powering the gas communications hub. A key design requirement is that the hub should have a secure and un-interruptible electricity supply. Any mains electricity supply taken after the meter is susceptible to disconnection by a prepayment meter and wilful or accidental disconnection by the customer. The option to use a battery powered supply has been discounted by manufacturers who have indicated that batteries would not support the requirements of SMETS. (See appendix).

The proposed technical solution therefore envisages a device fitted between the electricity meter and cut-out, though this may take a number of physical forms.

This document sets out:

- the technical requirements for the gas communications hub power device
- the installation process
- the potential scenarios when the electricity supplier is ready to install the electricity smart meter
- the responsibilities and liabilities of industry parties
- the handling of communications faults
- the handling of communications hub power consumption

2. Communications Hub and Power Device – Technical Requirements

The requirements below are in addition to any functional and performance requirements of communications hubs in general, eg performance, R&TTE approval, EMC emissions etc.

Such a device must:

- meet necessary ESQC regulations (ESQCR Section 24.-(1)) in that it shall be
 - suitable for its purpose;
 - installed and, so far as is reasonably practicable, maintained so as to prevent danger; and
 - protected by a suitable fusible cut-out or circuit breaker which is situated as close as is reasonably practicable to the supply terminals.
- be safe and suitable for use at relevant service positions, ensuring
 - personal safety against electric shock

- personal safety against effect of excessive temperature
- protection against spread of fire
- protection against penetration of solid objects, dust and water
- be tamper resistant and sealable using MOCOPA® seals.
- have no impact on the quality or security of the electricity supply to the consumer.
- not compromise revenue protection principles or facilitate illegal abstraction of electricity
- be of such physical size as to be normally accommodated within/at a metering position
- not impair the electricity meter operator in maintaining their meter
- have a life consistent with the life of the gas meter

Essential requirements for the device are analogous with those for an electricity meter in that it must:

- be suitable for use on a 230V 50Hz mains system
- be of protective class II (EN50470-1:2006 5.7) and have clearance and creepage distances in accordance with EN50470-1:2006 5.6 table 4
- have insulation complying with the requirements of EN50470-1:2006 sec 7.3
- be resistant to heat and fire; ie the device casings shall ensure reasonable safety against spread of fire and should not be ignited by thermal overload of live parts in contact with them. (Test as per EN50470-1:2006 5.8)
- be capable of withstanding a through fault until it is cleared by the cut-out fuse (100 Amp BS88/BS1361 maximum)
- be designed to operate in existing meter operating environments including damp cellars and meter boxes without doors. IP rating shall be no less than that for an electricity meter; (eg IP51 – see EN50470-1:2006 sect 5.9).
- have appropriate protection (a fuse) in the event of an internal fault within the hub device
- have adequate mechanical strength in compliance with EN50470-1:2006 5.2.2
- have an internal power consumption of no greater than 2W.

As stated, devices complying with the above may take a number of physical forms. One current design features a hub and a hub adaptor arrangement.

NB A so called 'Gas 1st' hub need have no inherent tie in to gas metering other than the event which triggered its installation and might equally well be used as an electricity hub. It is an independent hub device as envisaged by DECC.

3. Installation Process

Prior to visiting site, an appointment shall be made; the customer must be informed that the electricity supply will be de-energised temporarily as part of the smart gas install and consent to do so confirmed. The customer will also be advised that this visit is solely for the gas meter installation and that the electricity supplier will make appropriate arrangements to replace his meter in due course.

- Installer visits property, confirming he is at the right metering point for the gas meter.
- Approaches customer and identifies the relevant, associated electricity meter; (the job must be aborted if this cannot be done).
- Advises customer that the electricity will be de-energised as part of the smart gas install and confirms consent.
- Ensures there are no vulnerable customer issues
- Inspects/risk assesses the gas installation to confirm that the gas meter can be changed.
- Inspects/risk assesses the electricity installation to confirm that the hub can be fitted.
 - Where space restrictions/built around electricity meter installations are encountered, Gas 1st installation will normally be aborted; (it is not envisaged that service position moves will be requested).
 - hub devices may not be appropriate for all electricity installation types, depending on Gas Supplier requirements. Eg three phase cut-outs and meter installations with integral (5 terminal) or external (2A) load switching may be excluded from the programme.
- Carries out HAN reception tests between the intended hub position and the gas meter position and also between the intended hub position and the intended IHD position.
- If any of the above checks are failed, aborts job and notifies relevant DNO/GDN if a hazard is discovered for which the DNO/GDN is responsible.
- Checks polarity of customer's electricity installation is correct.
- Checks extraneous metal work and associated metering/distribution equipment for any live components at electricity position
- Warns customer on impending electricity de-energization and advises customer to switch off sensitive equipment
- Switches off the customer's consumer unit/s
- Using appropriate PPE makes supply dead at cut-out fuse.
- Checks incoming polarity at cut-out
- Shrouds live cut-out terminal
- Checks to confirm dead
- Identify metering cables as per MOCOPA[®] requirement
- Installs Gas 1st connection device between cut-out and meter.

- This will involve removing the meter terminal cover, and may involve moving the meter itself to accommodate the hub device. A minimum of movement is preferred, to remain within the constraints of the existing customer's tails.
- Where necessary customer tails may have to be extended, in conformance with best industry practice
- When fitting the device, due consideration should be given to minimising any opportunity for interference or creation of any safety risk
- Checks that all terminations are secure. This includes the top terminal of the cut-out and all of the meter terminals, including the load side, even if these haven't been worked on.
- On completion of hub fitting, the installer re-energises at the cut-out, using appropriate PPE and then re-energises the customer's installation at the consumer unit/s
- Rechecks polarity of customer's electricity installation is correct.
- Applies MOCOPA® seals to the cut-out, the meter terminal cover, the hub device cover and any associated equipment.
- Confirms that the customer's electrical installation is operating correctly and advises that he can switch his equipment back on.

Under normal circumstances it is envisaged that installing the comms hub should take no longer than fitting a conventional electricity meter

On completion of the hub installation, the installer can go ahead and complete the gas meter installation in accordance with standard industry procedures and then commission both the hub to gas HAN link and the hub to IHD HAN link.

4. Subsequent Electricity Smart Meter Installation

This section addresses the situation where an electricity Supplier's meter operator attends site to fit a smart meter, and finds a Gas 1st installation in situ.

His required actions will depend on the SMETS version of Gas 1st system and the SMETS capabilities of the incoming electricity meter.

The following relates to technical compatibility. Appropriate commercial arrangements would be required for sharing of hubs, prior to the adoption of communications equipment into DCC.

Scenario A:

Existing equipment is: Dumb electricity meter; SMETS1 smart gas meter, SMETS1 Gas 1st hub and SMETS1 IHD.

- i) Incoming smart electricity meter is not compatible with SMETS1 gas system.
 - Fit smart electricity meter with a hub of its own, and fit an 'electric only' IHD. Leave existing SMETS1 gas system in situ
- ii) Incoming smart electricity meter is directly compatible with existing SMETS1 equipment
 - Fit electricity meter alone, ie without a separate hub of its own, and use the existing SMETS1 Gas 1st hub and SMETS1 IHD
- iii) Incoming smart electricity meter is compatible with SMETS2 only
 - Fit smart electricity meter with a SMETS2 hub of its own, and fit a SMETS2 'electricity only' IHD. Leave existing SMETS1 gas system in situ

Scenario B:

Existing equipment is: Dumb electricity meter; SMETS2 gas meter, SMETS2 Gas 1st hub and SMETS2 IHD.

- i) If incoming smart electricity meter is not compatible with SMETS2
 - Fit smart electricity meter with a hub of its own, and fit an 'electricity only' IHD
- ii) If incoming smart electricity meter is compatible with SMETS2
 - Fit smart electricity meter alone, ie without a separate hub of its own, and use the SMETS2 Gas 1st hub and SMETS2 IHD.

Note re Non-SMETS2 hubs.

If the electricity Supplier installs a SMETS2 hub on site where the gas Supplier has already installed a SMETS1 hub it is likely that the original Gas 1st equipment will need to remain in place to provide ongoing communications for the gas meter. This situation will remain until such time as the gas meter is replaced by a SMETS2 compatible meter. At the time of the gas meter change, the Gas 1st hub will be removed and the incoming SMETS2 gas meter paired on to the existing SMETS2 hub.

The reverse would apply where a SMETS1 electricity meter is installed where a SMETS2 gas installation is already in place. Ultimately, an incoming SMETS2 electricity meter would be paired to the existing SMETS2 gas hub.

In both cases the principle is the first SMETS2 hub on site remains in situ and provides the enduring solution, subject to commercial arrangements.

5. Responsibilities and Liabilities

The Gas 1st communications hub and power device shall be considered as part of the gas smart metering installation. Therefore the principles already accepted by industry with regard to liability for faults associated to metering equipment will also extend to the gas smart meter communications hub and power device.

In terms of MAP/MAM/Supplier issues, it is assumed that the device would be owned by the gas MAP and fitted by the gas MAM for the gas Supplier, with the latter renting it from the MAP.

From the perspective of liability for installation work, it is accepted that the original accredited installer has enduring liability for the safety of installation work under his seal until subsequent work is carried out on the electricity installation which will be informed by the replacement of the seals.

6. Communication Faults

Where smart gas and electricity meters share a common hub, be it, an 'electricity first' or a Gas 1st device, there will inevitably be occasions where the hub fails and communications for both electricity and gas suppliers are lost.

This will no doubt be detected by both parties in the pre DCC world and post DCC by the latter.

In either circumstance, it is envisaged that the party 'operating' the hub at the time of failure, will be responsible for rectifying the problem.

On occasions it may be necessary for either the electricity Supplier or Distributor to carry out a temporary or permanent de-energization of the electricity supply. In these situations it is not envisaged that the affected gas (or electricity) supplier(s) would receive any prior notification of this. Each Supplier would be responsible for identifying extended loss of communications with his meter and for putting suitable alternative arrangements in place should this be necessary.

Where a customer changes supplier subsequent to a Gas 1st smart meter being installed, the new supplier will need to decide whether it can support the smart meter installation. This scenario is no different to a situation where a customer was originally with one supplier for both gas and electricity but then decides to move to another supplier for their gas supply. If dual fuel metering has originally been installed the new gas supplier will need to decide whether it can support the smart metering installation in situ.

7. Communication Hub Power Consumption

It is envisaged that all smart metering communications devices, whether they be mounted inside an electricity meter, powered from an electricity meter or be stand alone devices, as in the case of a Gas 1st hub, will take their power from the unmetered side of the incoming supply.

Glossary

(NB. These represent illustrative rather than legal definitions)

ESQCR	<p>The Electricity Safety, Quality & Continuity Regulations</p> <p><i>The Statutory Instrument governing the distribution of electricity</i></p> <p>(See: http://www.legislation.gov.uk/ukxi/2002/2665/contents/made)</p>
DCC	<p>Data & Communications Company</p> <p><i>A company to be appointed by the government to manage data and communications for the UK's smart metering systems.</i></p>
DECC	<p>Department of Energy and Climate Change</p> <p><i>The UK government department managing the introduction of smart metering.</i></p>
IHD	<p>In Home Display</p> <p><i>A display unit showing electricity and or gas consumed by a customer and facilitating additional metering related functions</i></p>
MAP	<p>Meter Asset Provider</p> <p><i>The owner of a metering asset, eg a hub or meter</i></p>
MAM	<p>Meter Asset Maintainer</p> <p><i>The agent employed by the Supplier or customer to fit and maintain metering assets</i></p>
MOCOPA [®]	<p>The Meter Operations Code of Practice Agreement</p> <p><i>An agreement electricity networks and meter operators allowing the latter to de-energise the former's supply to customers by removing the cut-out fuse.</i></p>
SMETS1	<p>Smart Metering Equipment Technical Specifications Version 1</p> <p><i>DECC's specification for the functional requirements of a smart metering system.</i></p>
SMETS2	<p>Smart Metering Equipment Technical Specifications Version 2</p> <p><i>DECC's specification for the functional and interoperability requirements of a smart metering system.</i></p>

Appendix:

Use of batteries as an alternative to mains power.

Major meter manufacturers have advised that batteries cannot provide the energy density needed to support SMETS type gas metering functionality over the intended life of a Smart meter. Battery power would be incapable of providing anything more than simple AMR functionality with perhaps a single outbound daily read for a maximum of 10 years.

Manufacturers state that major consumers of energy for a hub in a SMETS environment are:

- Running security code – especially if hardware based.
- Frequent communications over HAN system for reading and control
- Regular WAN communication with the Head End System
- Updates of firmware and tariff configuration
- Communications for prepayment applications
- Use of the HAN for consumer applications
- Provision of 'last gasp' communications functionality
- Further unknown requirements as may be imposed by a DCC system.

Essentially none of these would be practicable without a mains power supply.