



Compliance testing and protocol approval of Settlement Meters and Outstations

Background

ELEXON has produced this guidance note to assist those seeking to deploy new Meters¹ and/or Outstations² for use in Half Hourly (HH) Settlement in the Great Britain (GB) market. ELEXON has primarily aimed this guidance at Meter/Outstation manufacturers seeking compliance testing approval and protocol approval, who may not be familiar with the [Balancing and Settlement Code](#) (BSC) and its Code Subsidiary Documents. Half Hourly Data Collectors (HHDCs) and the Central Data Collection Agent (CDCA) will also find this guidance useful when seeking protocol approval for Outstations they wish to collect HH data from, for use in Settlement.

The BSC metering requirements

The BSC sets out the rules for trading in the wholesale electricity market. [Section L: Metering](#) requires Meters and Outstations used for Settlement purposes to comply with relevant Settlement metering [Codes of Practice](#) (CoPs).

The current suite of CoPs covers Settlement Metering Equipment³ requirements for circuits at domestic premises all the way up to large sites with circuits that have a rated capacity of over 100MVA (CoP1⁴), e.g. Generating Plant. CoP4⁵ covers the calibration, testing and commissioning of Settlement Metering Equipment and as such is not relevant to this guidance⁶.

A single Meter or Outstation may be compliant with a number of CoPs but the relevant CoP for a circuit is the one that is in force at the time the Registrant/Supplier responsible for the Metering System, comprising that Metering Equipment, first registers it for Settlement purposes.

There are two market sectors within the BSC: the Non Half Hourly (NHH) market and the HH market. The BSC requires HH Meter readings for Settlement. A process called Profiling converts NHH Meter readings to HH Meter readings.

Non Half Hourly

There is no formal process under the BSC for approving Meters for Settlement purposes in this sector as the onus is on the Supplier to ensure compliance with a particular NHH Settlement CoP. ELEXON has produced some guidance on [‘Smart Metering and Compliance with the BSC’](#).

¹ The BSC defines a Meter as a device for measuring Active Energy or Reactive Energy.

² The BSC defines an Outstation as equipment which receives and stores data from a Meter(s) for the purpose, inter alia, of transfer of that metering data to the CDCA or a Data Collector, as the case may be, and which may perform some processing before such transfer and may be one or more separate units or may be integral with the Meter.

³ The BSC defines Metering Equipment as Meters, measurement transformers (voltage, current or combination units), metering protection equipment including alarms, circuitry, associated Communications Equipment and Outstations and wiring.

⁴ ‘Code of Practice for the metering of circuits with a rated circuit capacity exceeding 100MVA for Settlement purposes’

⁵ ‘Code of Practice for the calibration, testing and commissioning requirements of Metering Equipment for Settlement purposes’

⁶ Remember that Meters provided by Meter manufacturers to their customers, for use in Settlement, will need to be calibrated (an ‘initial’ calibration) in accordance with CoP4.

Half Hourly

As Settlement Meter readings are required on a HH basis for this sector the relevant CoPs specify additional features such as Outstations that, among other things, store Meter readings for later transmission to a HHDC or the CDCA. Meters can be combined (integral) with an Outstation or separate but both must comply with a relevant CoP. A Meter type that meets the Smart Metering Equipment Technical Specification (SMETS) is exempt from CoP10 compliance testing and protocol approval. ELEXON has produced some guidance on '[Smart Metering and BSC Codes of Practice](#)'.

Compliance testing and protocol approval

When a manufacturer introduces a new Meter or Outstation into the market it needs to consider two Settlement aspects. The first is compliance with the requirements of a CoP and the second is approval of the communications protocol that the Outstation uses. A manufacturer needs to complete compliance testing of its Meter or Outstation, and at least one Data Collector (DC) needs to undergo protocol approval (for an Outstation), before Registrants/Suppliers can use the Meter or Outstation in Settlement.

Compliance testing

Compliance testing confirms whether a Meter performs to the required accuracy and external influences⁷ do not affect it. In respect of Outstations, compliance testing confirms that the functionality is in accordance with the relevant CoP.

The process for compliance testing is set out in BSC Procedure (BSCP) [601](#)⁸. BSCP601 details the necessary tests that the compliance testing body needs to perform^{9,10}. If the testing is successful, ELEXON will issue a certificate of compliance to the applicant, on behalf of the BSC Panel, against the relevant issue of a CoP. Note that the Meter/Outstation must pass all the relevant tests. Therefore, before testing can begin ELEXON and the manufacturer must agree the test schedule to ensure that it is relevant to the product in question. Failure to do so could result in test failures. ELEXON also recommends that a manufacturer satisfy itself that the Meter or Outstation would meet all the requirements set out in the relevant CoP, and the relevant tests for that CoP in BSCP601, prior to applying for compliance testing approval.

Test facilities

Laboratories with recognised relevant¹¹ accreditations, issued by the [United Kingdom Accreditation Service](#) or other international equivalent bodies, may perform compliance testing providing ELEXON has confirmed their suitability before the commencement of any testing. Manufacturers are free to nominate a test laboratory during the application process. It is the responsibility of the manufacturer to identify an appropriate test laboratory, fund testing and provide ELEXON with an appropriate test report.

⁷ E.g. Electromagnetic compatibility and immunity to electromagnetic high frequency fields.

⁸ 'Metering Protocol Approval and Compliance Testing'

⁹ Section 3.4 'Compliance Testing of Metering Equipment for Codes of Practice One, Two, Three, Five and Ten'.

¹⁰ In the event of any inconsistency between the requirements tested for as set out in BSCP601 and the requirements of the relevant CoP, the provisions of the relevant CoP shall prevail.

¹¹ E.g. ISO/IEC 17025 covering the measurement of Active and Reactive Power/Energy.

Certificates

Certificates reference particular Meter/Outstation products, with specific firmware versions, and the specific CoP Issues with which they comply. A change to any of these particulars after an approval is given will mean that existing certificates no longer apply to the changed product or new CoP Issue. The following are reasons why these items could change:

- ELEXON updates the CoPs from time to time and releases new version of the CoPs. ELEXON will release a new version and Issue if the change is material to a Meter or Outstation. If this is the case, further testing may be required in order to confirm the Meter/Outstation is compliant with the new Issue of the CoP(s). Where ELEXON makes a non-material change, only the version number of the CoP will increase. Version only updates have no impact on existing approvals. For example, if ELEXON updates CoP5 Issue 3 version 6 to CoP5 Issue 3 version 7, the difference will not be relevant to existing approvals. A change to the current transformer requirements would be a typical example;
- Meter/Outstation manufacturers are responsible for advising ELEXON of any changes to firmware. Where such changes are relevant to an existing approval it may be necessary for further testing to re-confirm compliance; and
- Certificates contain product type references, which rarely change. If however, the manufacturer needs to change the type reference, which a CoP approval covers, then the manufacturer should discuss this with ELEXON.

Protocol approval

Each HH CoP requires the BSC Panel (who have delegated responsibility to its Committees the [Imbalance Settlement Group](#) (ISG) and/or the [Supplier Volume Allocation Group](#) (SVG)) to approve the communication protocol used by an Outstation before the Registrant/Supplier can use the Outstation for Settlement purposes. The process for protocol approval is set out in [BSCP601](#)¹².

In order for BSC Panel to approve a protocol, it must undergo testing with at least one HHDC¹³ or the CDCA¹⁴. Testing will verify that the HHDC or CDCA can properly communicate with, and retrieve data from, the Outstation. There are a number of HHDCs, and the CDCA, therefore each DC intending to collect data from a new Meter/Outstation would require a separate protocol approval. Please see the Qualified Person Workbook (spreadsheet) on the [BSC Signatories and Authorised Persons](#) page of the ELEXON website for a list of HHDCs. You can contact the CDCA at neta@imserv.com.

In order to carry out protocol testing the relevant HHDC or the CDCA requires sample Outstations¹⁵. The testing involves setting up the sample Outstations on a test bench; simulating certain events (e.g. Outstation clock trimming, phase failure(s), reverse running (where fitted), battery failure (where fitted), etc.) and comparing the metered data collected using the manufacturer's software with the metered data collected by the DC's data collection software.

¹² On 28 June 2007, Change Proposal (CP)1174 modified [BSCP601](#) to allow ELEXON (as the BSC Company (BSCCo)) to issue compliance and protocol approval certificates to applicants on behalf of the BSC Panel, where all tests pass, and notify the BSC Panel (i.e. the ISG and the SVG) that they have been issued. ELEXON notifies the BSC Panel in the form of a BSC Panel Committee paper.

¹³ For Metering Equipment that will be registered in the Supplier Meter Registration Service (SMRS) of a Licensed Distribution System Operator (LDSO) against a Metering System ID (MSID) (also known as a Metering Point Administration Number (MPAN) under the [Master Registration Agreement](#)).

¹⁴ For Metering Equipment that will be registered in the Central Meter Registration Service (CMRS) against an MSID. Typically Metering Equipment associated with Transmission System connected generators/customers, some Distribution System connected generators, Transmission System connections to Distribution Systems (Grid Supply Points (GSPs)), Distribution System connections to other Distribution Systems (Distribution Systems Connection Points (DSCPs)) and Transmission or Distribution System connections to External Systems (e.g. France, Netherlands, Ireland, etc.).

¹⁵ The manufacturer usually provides these.

Normally, individual DCs apply for protocol approval, although a manufacturer can do this if it chooses to. The HHDC or the CDCA will agree a test schedule with ELEXON¹⁶ and, when the HHDC or CDCA is ready, ELEXON will witness their tests. If the Outstation passes all the tests then ELEXON will issue a protocol certificate, to the applicant, on behalf of the BSC Panel. The purpose of this certificate is to verify that the HHDC or the CDCA has properly implemented the manufacturer's protocol into its data collection system.

As with compliance certificates, protocol certificates reference particular products, firmware and data collection systems.

What if a Meter or Outstation fails compliance or protocol testing?

There are a number of options in the event of a failed test. The manufacturer can amend the product to correct the defect and further testing may be necessary to verify this. Alternatively, the manufacturer may seek a Metering Dispensation via a BSC Party. Under certain circumstances a Metering Dispensation may be approved, by the relevant BSC Panel Committee, to allow Registrants/Suppliers to use the product where it is not fully compliant with a CoP. [BSCP32](#)¹⁷ sets out the Metering Dispensation application process.

Notification of approvals to industry

Once a Meter/Outstation has passed compliance testing and at least one HHDC or the CDCA has successfully passed protocol approval, ELEXON will issue the certificates to the applicant(s). ELEXON will then:

- update the [CoP Compliance and Protocol Approval spreadsheet](#) on the CoP webpage;
- take a paper to the relevant BSC Panel Committees to notify them of the approvals; and
- publish a [Newscast article](#) to notify industry more generally.

Costs

All costs associated with compliance testing and protocol approvals are the responsibility of those seeking compliance and/or approval. ELEXON will not normally charge for its services but retains the right to recover any reasonable costs in so doing.

¹⁶ [BSCP601](#) provides an example test schedule in section 3.3 'Specification for the Testing of Metering Equipment Protocols'.

¹⁷ 'Metering Dispensations'

Responsibilities

The following is a non-exhaustive summary of responsibilities:

Manufacturers are responsible for:

- applying for compliance testing (and if the manufacturer chooses to, protocol approval);
- reviewing and agreeing test schedules;
- agreeing with ELEXON which test facility to use;
- arranging testing at a suitable test laboratory and delivery of product samples;
- providing ELEXON with test results; and
- arranging for protocol testing with a DC.

ELEXON is responsible for:

- acknowledging receipt of applications;
- agreeing test schedules;
- agreeing test laboratories;
- witnessing protocol tests;
- reviewing test results;
- providing certificates; and
- notifying new approvals to industry.

DCs are responsible for:

- applying for protocol approval;
- arranging testing with the manufacturer;
- receiving test samples and developing or implementing new protocols;
- developing and agreeing test schedules with ELEXON; and
- agreeing test witnessing dates with ELEXON.

Meters used for billing purposes

[The Office for Product Safety and Standards](#), part of The Department for Business, Energy and Industrial Strategy (BEIS), is responsible for the metrological accuracy of electricity meters.

The legislation is Schedule 7 of the Electricity Act 1989 and supporting regulations. Schedule 7 of the Electricity Act requires all meters used for billing to be of an approved pattern or construction and installed in an approved manner. Meter manufacturers can find further details at the BEIS webpage '[National regulation: gas and electricity meters](#)'.

Applicants for compliance testing approval of a Meter type (usually the Meter manufacturer) need to indicate, on the compliance testing application form ([BSCP601/03](#)¹⁸), the 'Ofgem Type approval'¹⁹ status of the submitted Meter type(s), i.e. whether the Meter type is:

- Measuring Instruments Directive (MID) type approved by a Notified Body (for use in the below 100kW market) or undergoing MID type approval; and/or
- Approved by BEIS under national legislation (GB approved²⁰) (for use in the above 100kW market) or undergoing GB approval.

Where the relevant body (i.e. Notified Body or BEIS) has issued a MID type approval and/or GB approval certificate for a meter type, please provide a copy of the certificate(s) with the application for compliance testing approval (BSCP601/03). If the MID and/or GB approval is being conducted in parallel with or following compliance testing approval, please provide a copy of the certificate(s) once the MID and/or GB approval certificate(s) have been issued. In this case, ELEXON will not issue a compliance testing approval certificate until the applicant provides this evidence. This is to avoid giving the impression to the applicant that once ELEXON issues a compliance testing approval certificate (and at least one protocol approval certificate) for a Meter type, Registrants/Suppliers can use the Meter type in the GB market.

For more information regarding this topic, please contact ELEXON's metering team: metering@elexon.co.uk.

Further Information

For more information please contact the **BSC Service Desk** at bscservicedesk@cgi.com or call **0370 010 6950**.

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¹⁸ 'Protocol Approval and Compliance Testing'. You can find a word copy of the application form on the BSCP601 landing page.

¹⁹ ELEXON has not updated BSCP601 to reflect changes in responsibility for legal metrology.

²⁰ GB approved meters will be listed on [Schedule 4](#) of the Meters (Certification) Regulations, (SI 1998/1566)