hour meter with time of use registers, internal connect and disconnect switches with two way communication capability. It is designed to measure flow of forward (import) or both forward (import) and reverse (export), store and communicate the same along with other parameters defined in this standard. It shall be remotely accessed for collecting data/events, programming for select parameters.

3.2.2 *Neighbourhood Area Network [NAN]* — This is a network comprising of group of smart meters and any other network elements such as DCU all of which communicate in a two way mode.

3.2.3 *Data Concentrator Unit [DCU]* — This device is part of NAN. It acts as a secured aggregate router and is an interface between smart meter and HES. It shall facilitate secured two way data transfer either in transparent/store and forward mode as per system designs. The other terminologies like/Network Element/Grid Router/Access point/edge router shall be synonymously used in place of DCU. This standard does not cover the requirements of DCU.

3.2.4 *Head End System [HES]* — This entity is a set of ICT based systems situated at the top of AMI system and receives data and events over NAN/WAN. HES is responsible for using these data/information and manage NAN/WAN components, smart meters and IHD. HES is also responsible for handling security keys, passwords intended for smart meter programmability and firmware upgrade and host applications such as remote connect/disconnect, analytics, billing, messaging etc. This standard does not cover the requirements of HES.

3.2.5 *In Home Display [IHD]* — This is a compact display module meant for mounting inside the consumer premises. The IHD shall receive data/ messages from smart meter and send responses to smart meter as and when required from HES. This standard does not cover the requirements of IHD

3.2.6 *Hand Held Unit [HHU]* — This is a device used to communicating locally over the optical port to the smart meter. Communication functionality requirements are as mentioned in IS 15959 (Part 2).

4 GLOSSARY OF TERMS

AMI	: Advanced metering infrastructure
AT&C	: Aggregate technical and commercial
CEA	: Central electricity authority
COSEM	: Companion specification for energy metering
DCU	: Data concentrator unit
DLMS	: Device language message specification
DoT	: Department of telecom
DSM	: Demand side management
DR	: Demand response
ETA	: Equipment type approval
ETSI	: European telecommunications standards institute
HAN	: Home area network
HES	: Head end system
HHU	: Hand held unit
ICT	: Information and communications technology
IEC	: International electrotechnical commission
IEEE	: Institute of electrical and electronics engineers
IETF	: Internet engineering task force
IHD	: In home display
IS	: Indian standard
ITU	: International telecommunication union
LCD	: Liquid crystal display
NAN	: Neighbourhood area network
OFC	: Optical fibre communication
PLC	: Power line communication
RF	: Radio frequency
ToU	: Time of use
WAN	: Wide area network
WPC	: Wireless planning co-ordination
NFAP	: National frequency allocation Plan

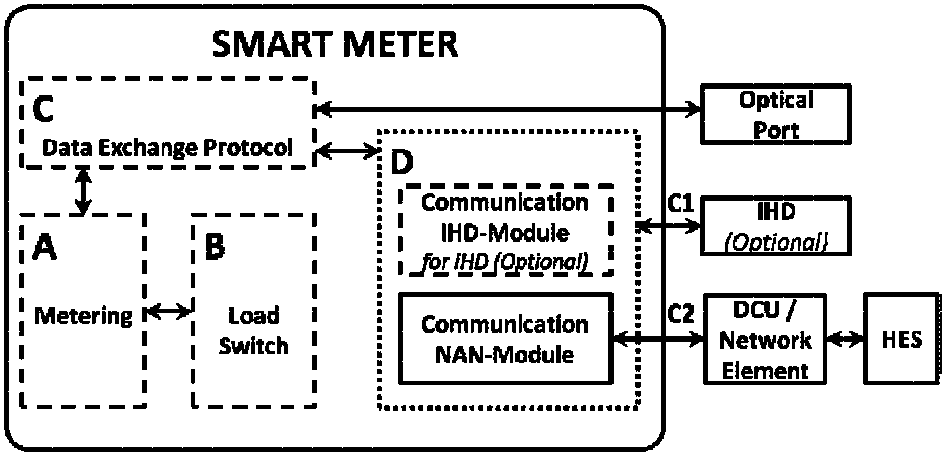
5 SMART METER ARCHITECTURE

5.1 The smart meter is a component of Advanced Metering Infrastructure. For the purpose of this standard the smart meter is conceived as single unit comprising of following functional zones:

a) Metering,
b) Load switch,
c) Metering protocol, and
d) Communication modules.

5.2 The Smart Meters may have wide usage and the buyer may like to choose desired features to meet the objectives of their overall system and site conditions. In order to facilitate such a flexible approach, the Smart Meter architecture are categorized into two variants. Based on the technical feasibility buyer may choose the combination of the variants best suited for a given geographical area. The Smart Meter shall have either NAN or WAN module as mandatory communication module for communicating to DCU or HES respectively. If IHD is chosen, then there could be a suitable additional communication module within the Smart Meter. The two variants are diagrammatically represented in Fig. 1 and Fig. 2. These variants are applicable to both built in type and pluggable type of Smart Meters.

Variant 1



LEGEND

A – Metrology
B – Load switch for control
C – Metering protocol
D – Communication

Optical port — As per IS 15959 (Part 2)
C1 – IHD Connectivity SM ↔ IHD (optional)
C2 – NAN Connectivity SM ↔ DCU

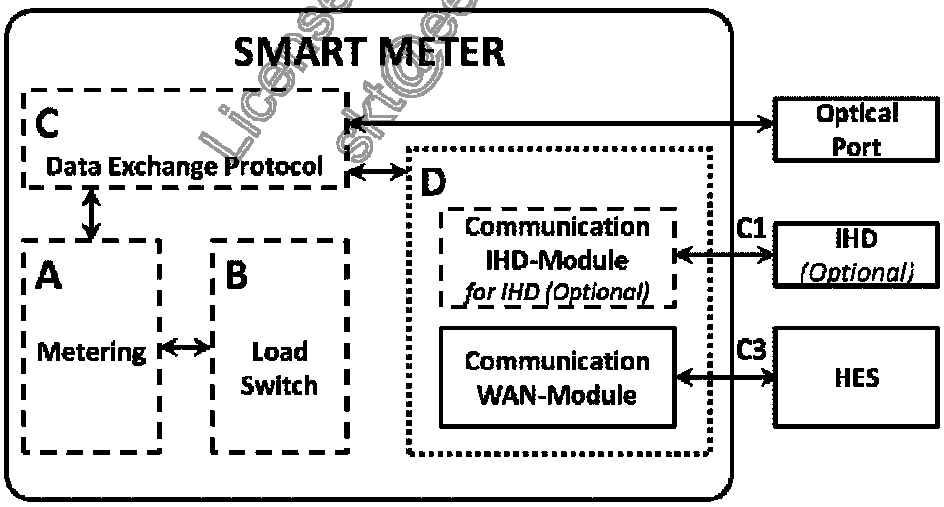
NOTES

1 The Smart Meter variant based on Fig. 1 shall provide connectivity C2 for two way communication with DCU using a NAN module.

2 If IHD is chosen this Smart Meter shall provide connectivity C1 for two way communication with IHD using the same NAN module or a suitable additional module as per buyer-seller agreement.

FIG. 1 SMART METER ARCHITECTURE

Variant 2



LEGEND

A – Metrology
B – Load switch for control
C – Metering protocol
D – Communication

Optical port — As per IS 15959 (Part 2)
C1 – IHD Connectivity SM ↔ IHD (Optional)
C3 – WAN Connectivity SM ↔ HES

NOTES

1 The Smart Meter variant based on Fig. 2 shall provide connectivity C3 for two way communication with HES using a WAN module.

2 If IHD is chosen this Smart Meter shall provide connectivity C1 for two way communication with IHD using a suitable additional module as per buyer-seller agreement.

FIG. 2 SMART METER ARCHITECTURE