



ISO/IEC TR 30148

Edition 1.0 2019-10

TECHNICAL REPORT



**Internet of things (IoT) –
Application of sensor network for wireless gas meters**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 17.120.10; 35.110

ISBN 978-2-8322-7524-5

Warning! Make sure that you obtained this publication from an authorized distributor.

CONTENTS

FOREWORD.....	4
INTRODUCTION.....	5
1 Scope.....	6
2 Normative references	6
3 Terms and definitions	6
4 Symbols and abbreviated terms.....	7
5 Network structure	8
6 Application layer protocol	9
6.1 Overview.....	9
6.1.1 General	9
6.1.2 AL function	9
6.1.3 AL structure.....	9
6.2 User application process.....	10
6.2.1 General	10
6.2.2 Functions of UAP.....	10
6.2.3 User application object	10
6.3 Device management application process	10
6.4 Application sub-layer	11
6.4.1 General	11
6.4.2 Functions of application sub-layer.....	11
6.4.3 Communication models.....	11
6.4.4 Application sub-layer communication service.....	14
6.4.5 Connection service	14
6.4.6 Data transmission service.....	20
6.5 Application sub-layer message format.....	22
6.5.1 General	22
6.5.2 ASL general message format.....	22
6.5.3 Message formats	24
Annex A (informative) Security.....	27
A.1 Overview.....	27
A.2 Security scenario analysis.....	27
A.3 Security services	28
Figure 1 – The structure of the wireless gas networks.....	8
Figure 2 – AL structure	9
Figure 3 – R/R model interaction process	12
Figure 4 – P/S model interaction process.....	13
Figure 5 – R/S model interaction process.....	13
Figure A.1 – Security framework	27
Table 1 – ASL services	14
Table 2 – Link services provided by the application layer	15
Table 3 – Parameters of the LINK. Request primitive	15

Table 4 – Parameters of the LINK. Response primitive 16

Table 5 – Connect services provided by the application layer 16

Table 6 – Parameters of the CONNECT. Request primitive 17

Table 7 – Parameters of the CONNECT. Response primitive 18

Table 8 – Release services provided by the application layer..... 18

Table 9 – Parameters of the RELEASE. Response primitive 19

Table 10 – Parameters of the RELEASE. Confirm primitive 19

Table 11 – Parameters of the RELEASE. Notification primitive..... 20

Table 12 – Data transmission services provided by the application layer..... 20

Table 13 – ASLDE-DATA. Request parameters..... 20

Table 14 – ASLDE-DATA. Confirm parameters 21

Table 15 – DATA. Indication parameters 21

Table 16 – Application sub-layer general message format..... 22

Table 17 – Message control field format..... 22

Table 18 – Message type subfield value 22

Table 19 – Format of the security control 23

Table 20 – Security control subfield value 23

Table 21 – Value of transmission model subfields 23

Table 22 – Operation code field value 25

Table 23 – Value of command code field..... 25

Table 24 – Acknowledgement message 26

INTERNET OF THINGS (IoT) – APPLICATION OF SENSOR NETWORK FOR WIRELESS GAS METERS

FOREWORD

- 1) ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.
- 2) The formal decisions or agreements of IEC and ISO on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees and ISO member bodies.
- 3) IEC, ISO and ISO/IEC publications have the form of recommendations for international use and are accepted by IEC National Committees and ISO member bodies in that sense. While all reasonable efforts are made to ensure that the technical content of IEC, ISO and ISO/IEC publications is accurate, IEC or ISO cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees and ISO member bodies undertake to apply IEC, ISO and ISO/IEC publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any ISO, IEC or ISO/IEC publication and the corresponding national or regional publication should be clearly indicated in the latter.
- 5) ISO and IEC do not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. ISO or IEC are not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or ISO or its directors, employees, servants or agents including individual experts and members of their technical committees and IEC National Committees or ISO member bodies for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication of, use of, or reliance upon, this ISO/IEC publication or any other IEC, ISO or ISO/IEC publications.
- 8) Attention is drawn to the normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this ISO/IEC publication may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

The main task of IEC and ISO technical committees is to prepare International Standards. However, a technical committee may propose the publication of a Technical Report when it has collected data of a different kind from that which is normally published as an International Standard, for example "state of the art".

ISO/IEC TR 30148, which is a Technical Report, has been prepared by subcommittee SC 41: Internet of Things and related technologies, of ISO/IEC joint technical committee 1: Information technology.

The text of this Technical Report is based on the following documents:

Draft TR	Report on voting
JTC1-SC41/90/DTR	JTC1-SC41/104/RVDTR

Full information on the voting for the approval of this Technical Report can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A bilingual version of this publication may be issued at a later date.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

With the improvement of wireless communication technologies and the demand for intelligent products required by home automation, factory automation and so on, wireless gas meter systems can develop in terms of safety, reliability, and convenience. Wireless gas meters can not only avoid the errors from manual meter reading and issues such as unstable signals during traditional gas meter reading, but also achieve functions such as dynamic rates, energy management, event alarm service, real-time data collection and analysis.

From the perspective of gas meter companies, the promotion of wireless gas meters is conducive to reducing labour costs and improving efficiency. From the point of view of gas meter manufacturers, the implementation of wireless gas meters will also help them to reduce costs. Consumers will readily accept the lower cost and increased convenience of wireless gas meters. So in the near future, with significant cost benefits and technical advantages, wireless gas meters will become more important in the market.

INTERNET OF THINGS (IoT) – APPLICATION OF SENSOR NETWORK FOR WIRELESS GAS METERS

1 Scope

This document describes

- the structure of wireless gas meter networks, and
- the application protocol of wireless gas meter networks.

2 Normative references

There are no normative references in this document.