
**Traditional Chinese medicine — Pulse
waveform format**

Médecine traditionnelle chinoise — Format de la forme d'onde de pouls

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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This document was prepared by Technical Committee ISO/TC 249, *Traditional Chinese medicine*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Traditional Chinese medicine — Pulse waveform format

1 Scope

This document specifies the application, in the context of traditional Chinese medicine practice, of medical waveform format encoding rules (MFER) to pulse condition waveform as measured in physiological laboratories, hospitals, bed-wards, pharmacies, clinics, community health centres and home care check-ups using pulse condition devices.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 19614, *Traditional Chinese medicine — Pulse graph force transducer*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 19614 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

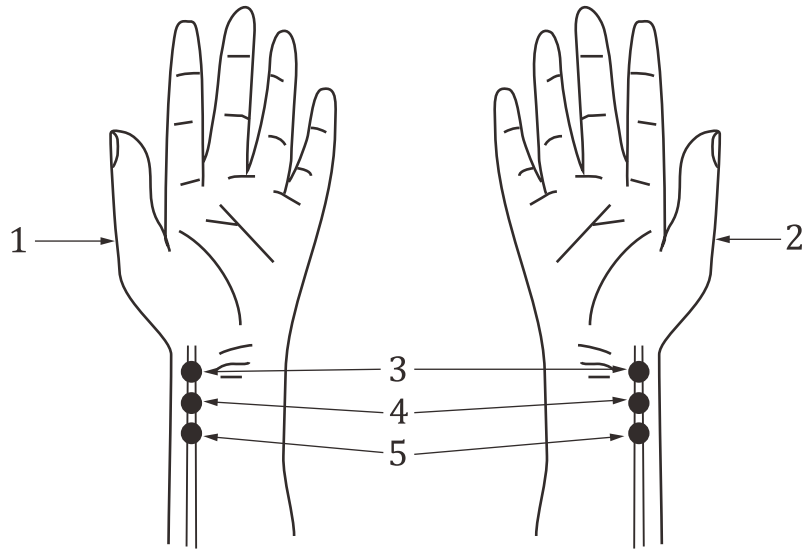
- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

3.1

pulse-taking location

place on the radial artery where the pulse condition is measured

Note 1 to entry: According to traditional Chinese medicine theory, there are three such places (cun/inch, guan/bar and chi/cubit) all over the radial artery, see [Figure 1](#).



Key

- 1 left hand
- 2 right hand
- 3 cun/inch
- 4 guan/bar
- 5 chi/cubit

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Figure 1 — Pulse-taking location

3.2 channel

individual waveform data group from the *pulse graph force transducer* (3.3)

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3.3 pulse graph force transducer

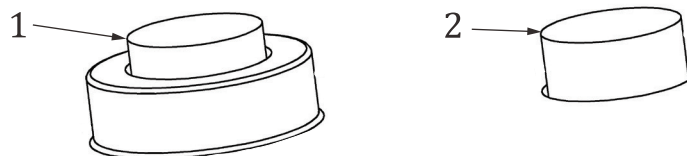
device that can detect pulsation of the radial artery and its peripheral tissues as a mechanical quantity and convert it into an electrical signal output according to a certain pattern for the purpose of traditional Chinese medicine pulse condition acquisition

Note 1 to entry: Transducers involved in this document only refer to pressure or force transducers.

[SOURCE: ISO 19614:2017, 3.1]

3.4 one signal transducer

pulse graph force transducer (3.3) with only one channel (see [Figure 2](#))



Key

- 1 signal transducer with auxiliary plan
- 2 signal transducer without auxiliary plan

Figure 2 — One signal transducer

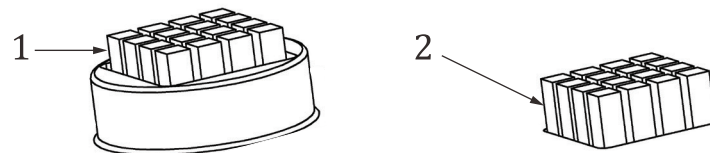
3.5

array signal transducer

pulse graph force transducer (3.3) with multi-channel (see [Figure 3](#))

Note 1 to entry: Array signal transducer can be further divided into line array transducer and cross array transducer.

Note 2 to entry: Line array transducer can be further divided into horizontal parallelism line array transducer and vertical parallelism line array transducer.



Key

- 1 array signal transducer with auxiliary plan
- 2 array signal transducer without auxiliary plan

Figure 3 — Array signal transducer

4 Encoding format

4.1 Primary description

4.1.1 General

This document provides encoding rules for pulse waveform. In addition, together with encoding of information of recognition for waveform, measurement information and interpretation information is provided, but these are all optional functions and are dependent on each implementation concept.

NOTE Interpretation code or measurement value might be described by other standards such as HL7 or XML.

All the symbols and their tags used in this document are specified in ISO 22077-1.

4.1.2 Sampling attributes

4.1.2.1 General

Sampling attributes, including sampling rate and resolution, are given in [Tables 1](#) to [4](#). An example of the encoded data and its explanation can be found in [Annex A](#), Table A.1.

4.1.2.2 MWF_IVL (0Bh): Sampling rate

This tag indicates the frequency or sampling interval for the medical waveform sampled (see [Table 1](#)).

Table 1 — Sampling rate

Symbol	Tag	Length Bytes	Value
MWF_IVL	11d/0Bh	≤ 6	Unit (1)
			Exponent (1)
			Mantissa (≤4)

The units may be frequency in hertz or time in seconds (see [Table 2](#)).

Table 2 — Sampling rate unit

Unit	Code	
Frequency	Hz	0d
Time interval	s	1d

EXAMPLE If the code is 0B 04 01 FD 00 01, that means the sampling rate is equal to $1 \cdot 10^{-3}$ and the units are 1 ms.

4.1.2.3 MWF_SEN (0Ch): Sampling resolution

This tag indicates the resolution, minimum bits, for the medical waveform sampled (see [Table 3](#)).

Table 3 — Sampling resolution

Symbol	Tag	Length Bytes	Value
MWF_SEN	12d/0Ch	≤ 6	Unit (1)
			Exponent (1)
			Mantissa (≤4)

The units should be force in newtons, mass in kilograms, pressure in Pascals and voltage in volts (see [Table 4](#)).

Table 4 — Sampling resolution units

Unit		Code	Default
Voltage	V	0d	None
Force	N	6d	None
Pressure	Pa	2d	None
Mass	kg	16d	None

4.1.3 Frame attributes

4.1.3.1 General

A frame is composed of data blocks, channels and sequences.

4.1.3.2 MWF_BLK (04h): data block

This tag indicates the number of data sampled in a block. The number of data blocks in pulse condition waveform coding is defined as 01, namely one data block in one sequence (see [Table 5](#)).

Table 5 — Data block

Symbol	Tag	Length Bytes	Value
MWF_BLK	04d/04h	1	01

4.1.3.3 MWF_CHN (05h): quantity of channels

This tag indicates the amount of channels. This tag should be specified before each definition of the channel attribute (see [Table 6](#)).

Table 6 — Quantity of channels

Symbol	Tag	Length Bytes	Value
MWF_CHN	05d/05h	≤ 4	Based on pulse-taking location and the type of the transducer

4.1.3.4 MWF_SEQ (06h): sequences

This tag indicated the quantity of sequences (see [Table 7](#)). The sequence amount should be fixed as 01 in this document.

Table 7 — Sequences

Symbol	Tag	Length Bytes	Value
MWF_SEQ	06d/06h	1	01

4.1.4 Waveform**4.1.4.1 General**

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The waveform class and type, waveform attributes and waveform data are encoded as follows.

4.1.4.2 MWF_WFM (08h): waveform class

This tag indicates the type of waveform encoding rule (see [Table 8](#)). The value should be fixed as “pulse condition waveform” in this document.

Table 8 — Pulse condition waveform

Symbol	Tag	Length Bytes	Value
MWF_WFM	08d/08h	24	Pulse condition waveform

4.1.4.3 MWF_LDN (09h): waveform attributes

This tag indicates the attributes of waveform (see [Table 9](#)).

Table 9 — Definition of waveform attributes

Symbol	Tag	Length Bytes	Value
MWF_LDN	09d/09h	4	Waveform code

The waveform code in the waveform attribute definition consists of four bytes, as shown in Figure 4. Among them, the coding and description of each byte is shown in Tables 10 to 13.

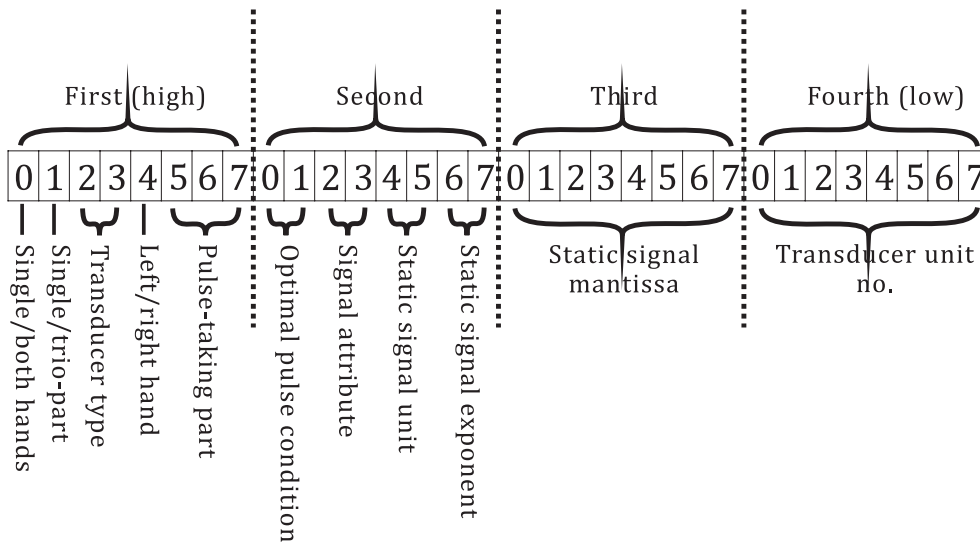


Figure 4 — Waveform code structures

Table 10 — The first byte (high)

Single/both hands ^a		Single part/trio-part ^b		Transducer type		Left/right hand		Pulse-taking location	
Code	Explanation	Code	Explanation	Code	Explanation	Code	Explanation	Code	Explanation
0	Single	0	Cun or guan or chi	00	One signal transducer	0	Left	000	Others
				01	Array signal transducer			001	Cun
								010	Guan
								011	Chi
1	Both	1	Cun and guan and chi	10	Vertical parallelism line array	1	Right	100	Above cun
				11	Cross array			101	Blow chi

^a Used to indicate whether the pulse-taking of a single hand or both hands.

^b Used to indicate whether the pulse-taking of a single part or trio-part.