RADIODETECTION®

1205CXB™

Time Domain Reflectometer and Cable Analyser

User Guide

90/1205CXB-UG-ENG/02

SPX

Preface

Thank you for your interest in Radiodetection's 1205CXB™ cable fault locator. Please read this User Guide in its entirety before attempting to use the 1205CXB.

Radiodetection products and documents, including this User Guide, are under continuous development. The information contained within is accurate at time of publication; however the 1205CXB, this user guide and all its contents are subject to change.

Radiodetection Limited reserves the right to modify the product without notice and some product changes may have taken place after this user manual was published.

Contact your local Radiodetection dealer or visit **www.radiodetection.com** for the latest information about the 1205CXB product family, including this guide.

CAUTION: This guide provides basic operating instructions for the 1205CXB TDR and cable fault locator. It also contains important safety information and guidelines and as such should be read in its entirety before attempting to operate the 1205CXB.

This guide is intended as a quick reference guide only. For detailed instructions, including the use of accessories, refer to the 1205CXB Operation Manual, which is available for download from **www.radiodetection.com**.

Certificates of conformity are also available from **www.radiodetection.com**.

Warnings

Before using, review all safety precautions. Note and observe all warning and caution statements on the equipment and in the documentation.

The 1205CXB contains no user serviceable parts. Do not modify any part or accessory of this instrument. If the unit is damaged, do not use. Also, secure the product from use by others.

⚠️ **WARNING! Direct connection to live cables is POTENTIALLY LETHAL.**

⚠️ **WARNING! To avoid electric shock, do not remove covers or any parts of the enclosure.**

⚠️ **WARNING! The 1205CXB contains a Lithium-Ion battery. Do not exceed the maximum rated charging current of 2A.**

⚠️ **WARNING! The 1205CXB is not intrinsically safe or Ex rated, do not operate it near flammable gases or fumes.**

If the instrument or any associated accessory is used in any manner not detailed by the accompanying documentation, the safety of the operator may be compromised.

Do not expose the equipment to extreme temperatures. Store the instrument indoors during extreme hot or cold temperatures and bring the instrument to within specified operating temperatures (0 to +50°C / 32 to 122°F) before using.

Description

The 1205CXB is a Time Domain Reflectometer, also known as a Cable Radar. Electrical pulses are transmitted into a cable, and a portion of the pulse energy is reflected back from cable imperfections. These can be discontinuities (eg cable joints, changes in cable type or the far end of the cable under test) or faults (typically short circuits, open circuits, high resistance joints or water ingress).

The transmitted pulse and the reflected pulse(s) are shown on the display. The time taken by the pulse to travel to the imperfection and back is a measure of the distance to the fault. The distance is displayed after the cursor is positioned at the start of the reflected pulse. The type of imperfection can be assessed by analysing the displayed waveform.

NOTE: The cable must contain at least two conductors or one conductor and screen. This can be generalized to include other multi-conductor set ups such as district heating systems.

Velocity of Propagation (VOP)

The properties of the cable, mainly the insulation between the two conductors, greatly affect the velocity of the TDR pulses. This velocity is called the Velocity of Propagation (VOP), or Velocity Factor (PVF). The TDR uses this value to calculate distance, so it is important for this to be as accurate as possible.

The 1205CXB can accept user selectable values between 10.0% and 99.9%. The "Operation" section shows how you change the VOP to the desired value.

Before you begin

This guide is intended to be a quick reference guide. We recommend you read the full Operation Manual before you attempt to operate the 1205CXB.

The 1205CXB contains a Lithium-Ion battery. Charge it using the USB cable and multi-region charger provided and do not exceed the specified maximum charging current.
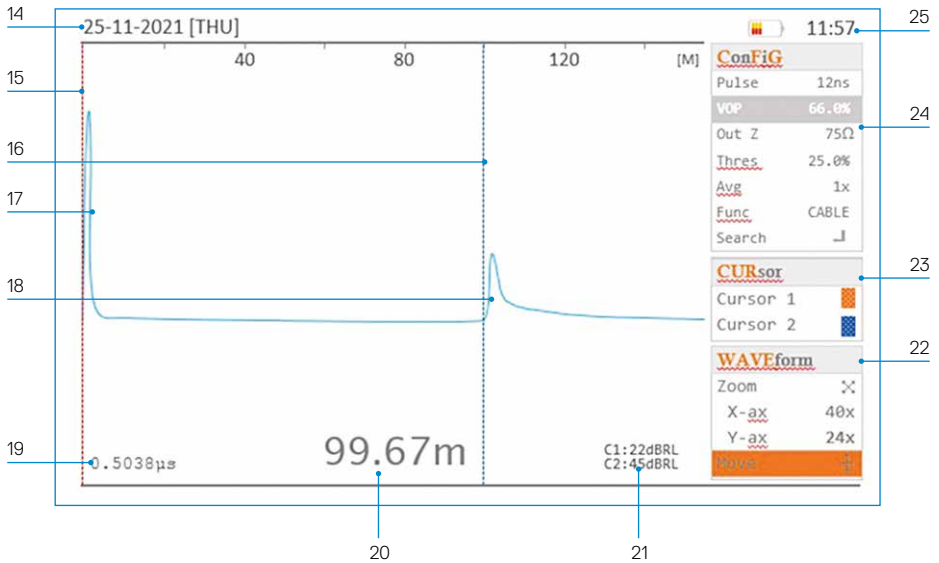
User interface
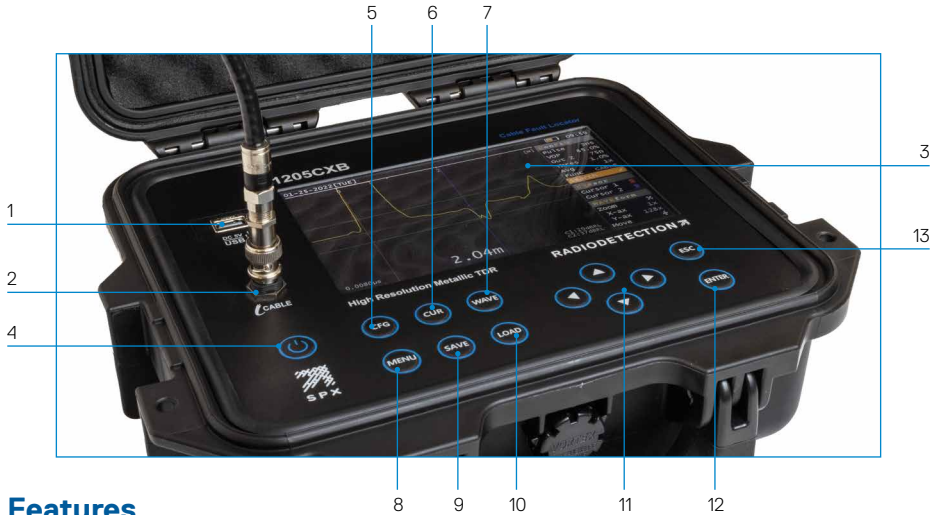
Features

1	USB port
2	BNC cable connector
3	Display

Keypad

	Name	Function
4	Power	Turn 1205CXB On and Off
5	**ConFiGuration**	Select parameters and auto search in the **ConFiG** submenu
6	**CURsor**	Select cursor 1 or 2
7	**WAVEform**	Select move or zoom function for a waveform
8	**MENU**	Select units, a pre-loaded cable and system settings
9	**SAVE**	Save waveform to 1205CXB's memory or USB
10	**LOAD**	Load a waveform from 1205CXB's memory or USB
11	Left, up, down, right arrows	Increase/decrease parameters Zoom, move waveforms and cursors
12	**ENTER**	Confirm menu item or waveform selection
13	**ESCape**	Escape, back one step in the menu

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ConFiG
Pulse   12ns
VOP   66.0%
Out Z   75Ω
Thres   25.0%
Avg   1x
Func   CABLE
Search   ⌐

CURsor
Cursor 1
Cursor 2

WAVEform
Zoom   ✕
  X-ax   40x
  Y-ax   24x
Move

0.5038µs   99.67m   C1:22dBRL
                                  C2:45dBRL

Display features

	Name	Information and use
14	Date	Provides date information to stored files
15	Cursor 1	Position for accurate measurement to discontinuities
16	Cursor 2	Position for accurate measurement to discontinuities
17	Launch pulse	The pulse sent out by the TDR
18	Reflected pulse(s)	Pulse(s) reflected by a cable discontinuity
19	Time measurement	Time for the pulse to reach the discontinuity
20	Distance measurement	Distance along the cable to the discontinuity
21	dBRL measurements	dB of Return Loss at cursor 1 and 2
22	**WAVE**form submenu	Use, with the arrow keys, to Zoom and Move waveforms
23	**CUR**sor submenu	Select cursor 1 or 2. Move cursors with left and right arrow keys
24	**C**on**FiG**uration submenu	Change selected parameter with arrow keys
25	Time	Provides time information to stored files
26	Battery status	Shows battery charge

Operation

1. Press the Power button, 4, to turn 1205CXB on.
2. Connect a cable to the BNC connector, 2.
3. Press the **CFG** button, 5, repeatedly until VOP is highlighted in the **C**on**F**i**G** submenu, 24.
4. Use the arrow buttons, 11, to set the VOP% to match the VOP% of the cable. This can usually be found in the cable's datasheet under VOP, Velocity of Propagation or Dielectric.
5. Press the **CUR** button, 6, to highlight **Cursor 1**, 15, and if necessary, use the left and right arrow buttons to position **Cursor 1** at the start of the launch pulse, 17.
6. Press the **CUR** button again to highlight **Cursor 2**, 16, and use the left and right arrow buttons to position Cursor 2 at the start of the reflected pulse, 18, as shown in the Display diagram.
7. Read the distance, 20, or time, 19, to the discontinuity.
8. Additional functions, such as changing measurement units, setting date / time, loading a cable from memory, and saving and recalling waveforms, can be accessed via the **MENU** button, 8. For details, please refer to the 1205CXB Operation Manual.
9. Press the Power button, 4, to turn 1205CXB off.

Waveforms

The display of the 1205CXB shows a launch pulse at the left hand side of the display and a reflected pulse if any cable imperfections are within range.

Move Cursor 2 so that it is positioned at the start of the reflected pulse, as shown in the Display diagram. The distance to the imperfection is then displayed at the bottom of the display. You can change the units of measurement in the **MENU**.

Open circuit and high impedance series faults will result in a positive (upward) reflected pulse. Short circuit and low impedance shunt faults will give a negative (downward) reflection.

WaveView™ PC software

Radiodetection's WaveView PC program is a software package that allows you to view, manipulate, print and archive cable signature waveforms produced by 1205CXB cable fault locator. Visit **www.radiodetection.com** for a download link and usage information.

Training

Radiodetection provides training services for most Radiodetection products. Our instructors will train equipment operators or other personnel at your preferred location or at Radiodetection headquarters. For more information go to **www.radiodetection.com** or contact your local Radiodetection representative.

Software upgrades

From time to time, Radiodetection may release software upgrades to enhance features and improve performance of the 1205CXB. Software upgrades are free of charge and provided through a Radiodetection portal, via a computer running Radiodetection's WaveView™ software.

Care and maintenance

Radiodetection recommends that you service the 1205CXB annually.

The 1205CXB cable fault locator is robust, durable and has a weatherproof rating of IP54 (lid open) and IP68 (lid closed). However, you can extend your equipment's life by following these care and maintenance guidelines:

- Store the equipment in a clean and dry environment
- Ensure connection sockets are clean, free of debris and corrosion and are undamaged
- Do not use this equipment when damaged or faulty
- Only use a battery charger approved by Radiodetection. Do not exceed the specified maximum charging current of 2A.

For a list of the importers of the 1205CXB into Europe, please visit: **https://www.radiodetection.com/en/european-importers**

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