

# DSRC OBE tester ME9100E

## Supporting ETC and ITS spot

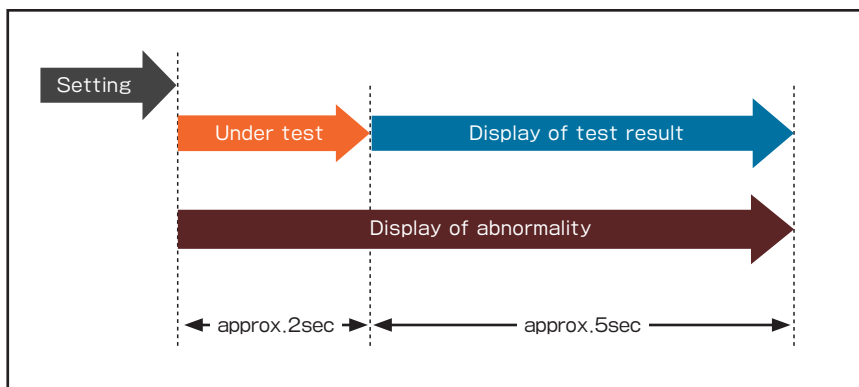
- **Complete one piece type**  
Only mainframe without any connection cable.
- **Compact & lightweight**  
Compact 138(W) × 101(H) × 30(D)mm and lightweight 250g.
- **Easy operation**  
Easy operation by one multi-directional switch.



### Description of equipment

DSRC OBE tester ME9100E is a tester to check whether OBE installed on a car communicates in the air correctly. For an automobile dealer, a car accessories shop and a car repair factory installing OBE, ME9100E is a necessary tool to deliver a perfect OBE to their customers.

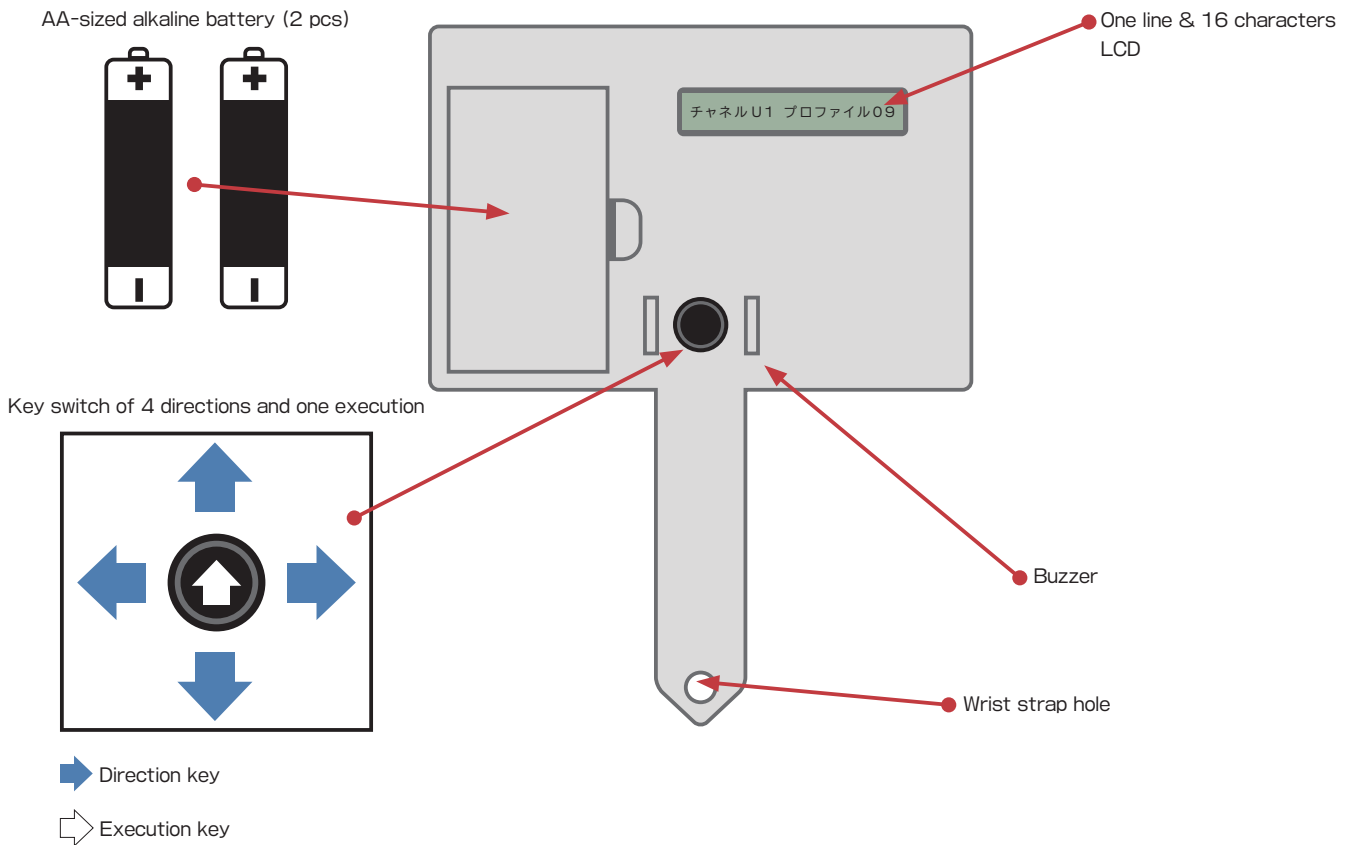
After transmitting FCMC from ME9100E, it is confirmed whether ACTC and WCNC return from OBE correctly. Since the power is automatically turned off after about 6 seconds (about 8 seconds @ DSRC OBE) from test start, battery life becomes longer. The number of test times is possible about 500 times.



The screens of "Under test" and "Display of test result" are as follows.



Moreover, there are three kinds of flat battery, carrier detection and failure of equipment in "Display of abnormality".



## Channel and profile settings

Pressing the execution key turns on the power and displays the following screen. A cursor will appear beneath the item to be set, allowing you to select a number using the up and down arrow keys. To choose other items, use the left and right arrow keys.

チャンネル U1 プロファイル09      チャンネル:Channel プロファイル:Profile

### Setting of channel

Seven channels are assigned in the DSRC communication standard. ME9100E can select one channel from seven of U1 to U7 as well.

Channel	Carrier frequency (GHz)
U1	5.835
U2	5.845
U3	5.840
U4	5.830
U5	5.825
U6	5.820
U7	5.815

### Setting of profile

The profile specifies the combination of two modulation systems.

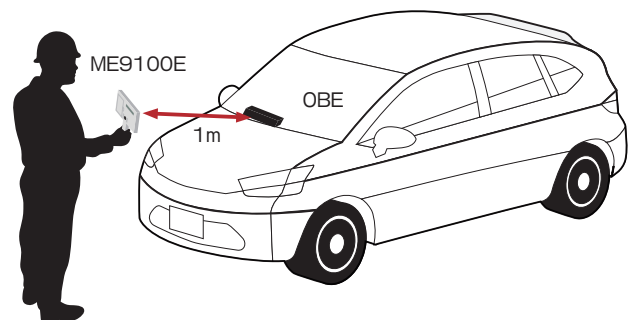
- ME9100E : Transmits FCMC, MDC and ACKC.
- OBE : Transmits ACTC, MDC and ACKC.

Item	P9	P10	P11	P12
FCMC/ACTC	ASK	ASK	ASK	QPSK
MDC/ACKC	ASK	ASK	QPSK	QPSK
Number of CH	2	7	7	7

## How to test

The test is completed in the easy procedures of ① to ④ as described below.

- Turning on ME9100E  
When execution key is pressed, the power supply is turned on.
- Setting of OBE to be tested  
Either ETC test or DSRC test is selected with left and right direction keys.
- Execution of test  
When execution key is pressed, the test is started.
- Confirmation of test result  
"Pass" or "Fail" is confirmed with LCD screen or buzzer sound.



Moreover, ME9100E is opposed in parallel to OBE and the test is performed 1m away (range from 0.8 to 1.2m), as shown in figure.

## Buzzer sound

Regarding key operation, under test, test result or abnormality, the state can be confirmed with buzzer as shown in table below. The state can be grasped by sound though the LCD screen is not watched during test.

State	Buzzer sound		
Key operation		One short sound	-
Under test		Short discontinuous sound	-----
Test result	Pass	Soundless	
	Fail	Continuous sound	—————
Abnormal	Flat battery	Long discontinuous sound	-- -- -- --
	Carrier detection	Long & short discontinuous sound	-. . . . .
	Equipment failure	Three short discontinuous sound and soundless	--- --- ---

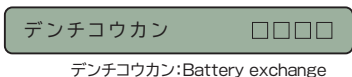
## RSU carrier detection function

If there is a roadside unit (RSU) under operation nearby, it should not be affected from anything. So, ME9100E detects RSU carrier first, and the subsequent test will be stopped if a carrier exists. The minimum carrier detection level is approx. -78dBmeirp. If a career is detected, the following screen is displayed. In this case, it should be confirmed whether RSU exists around. If it exists, the test should be performed further away.



## Battery remainder indication

The battery remainder is displayed at six levels on the right side of screen as shown in table below. Besides, the following screen is displayed in case of remainder 0%, and subsequent use is not available. Please exchange to new batteries. The alkaline battery will be recommended from a point of the capacity.



Indication	Battery remainder	
デンチコウカン	□□□□	0%
	□□□□	>0 to ≤10%
	□□□■	>10 to ≤35%
	□□■■	>35 to ≤60%
	□■■■	>60 to ≤85%
	■■■■	>85 to ≤100%

## Self-check function

When execution key for test start is pressed, ME9100E performs read/write check of RAM in CPU and external RAM, and checksum of program ROM before test. If abnormal, the following screen is displayed and the subsequent operation is stopped.



## Setup power-off function

The setting values at the time of power-on are set to the values at the time of last power-off. Therefore, it is very convenient when carrying out test and measurement by the same setting.

## Auto power-off function

The power supply is automatically turned off after approx.6 sec (approx.8 sec at DSRC OBE) from the test start. The battery life will be longer for this function. The number of test times is possible about 500 times with the alkaline dry battery.

# Specifications

※ Unless specified, the specifications of ETC(ASK) and ITS spot (QPSK) are in common.

## Transmission characteristics

<b>Transmission frequency</b>	5775, 5780, 5785, 5790, 5795, 5800, 5805MHz
<b>Accuracy</b>	Within $\pm 5$ ppm
<b>Transmission power</b>	Within $-1.7 \pm 1.9$ dBm@ASK : Peak power, QPSK : Average power within burst
<b>Strength of spurious or unwanted emission</b>	<ul style="list-style-type: none"><li>Spurious band: less than <math>2.5 \mu W</math></li><li>Out of band: less than <math>25 \mu W</math></li><li>Boundary frequency: carrier <math>\pm 12.2</math>MHz</li></ul>
<b>Occupied bandwidth</b>	Less than 4.4MHz
<b>Adjacent channel</b>	Less than $-30$ dBc@ $5 \pm 2.2$ MHz
<b>Leakage power</b>	Less than $-40$ dBc@ $10 \pm 2.2$ MHz ※ASK : Peak power, QPSK : Average power within burst
<b>Carrier off leakage power</b>	Less than $2.5 \mu W$
<b>Signal transmission rate</b>	<ul style="list-style-type: none"><li>1024kbps@ASK</li><li>4096kbps@QPSK</li></ul>
<b>Accuracy</b>	Within $\pm 100$ ppm
<b>Modulation factor /Accuracy</b>	<ul style="list-style-type: none"><li>More than 0.75@modulation factor(ASK)</li><li>Less than 10.0%@modulation accuracy(QPSK)</li></ul>

## Receiving characteristics

<b>Receiving frequency</b>	5815, 5820, 5825, 5830, 5835, 5840, 5845MHz
<b>Receiving sensitivity</b>	Approx. $-48$ dBm@ front ※ASK : Peak power, QPSK : Average power within burst
<b>Radio wave strength emitted subordinately</b>	Less than $2.5 \mu W$
<b>Input damage level</b>	$+3$ dBm@ front

## Communication characteristics

<b>Modulation method</b>	ASK, $\pi/4$ QPSK
<b>Communication profile</b>	Supporting profile 9 to 12
<b>Communication system</b>	Half-duplex
<b>Communication form</b>	Point-to-point (Communication with one OBE)
<b>SAM</b>	Without

## Contents of test

Communication tests at radio level between the instrument and the OBE.

## Other functions

- Buzzer sound
- RSU carrier detection function
- Battery remainder indication
- Self-check function
- Setup power-off function
- Auto power-off function

## General

<b>Display</b>	One line & 16 characters LCD
<b>Power supply</b>	AA-sized alkaline battery (2 pcs)
<b>Operating temperature</b>	$-10$ to $+45$ °C
<b>Storage temperature</b>	$-20$ to $+65$ °C
<b>Water resistance</b>	JIS C0920 /class1 equivalent (200mm height, precipitation 1mm / minute, 10 minutes dropping)
<b>Dimensions</b>	138(W) × 101(H) × 30(D)mm (Excluding handle and projections)
<b>Weight</b>	Approx. 250g
<b>Standard accessories</b>	AA-sized alkaline battery (2 pcs), Operation manual

※MICRONIX Corporation reserves the right to make change in design, specification and other information without prior notice.

**MICRONIX**  
**MICRONIX CORPORATION**

2987-2, KOBIKI-CHO, HACHIOJI-SHI, TOKYO 193-0934 JAPAN

TEL: +81-42-637-3667 FAX: +81-42-637-0227

URL : <https://micronix-jp.com/> E-mail : [micronix\\_e@micronix-jp.com](mailto:micronix_e@micronix-jp.com)

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