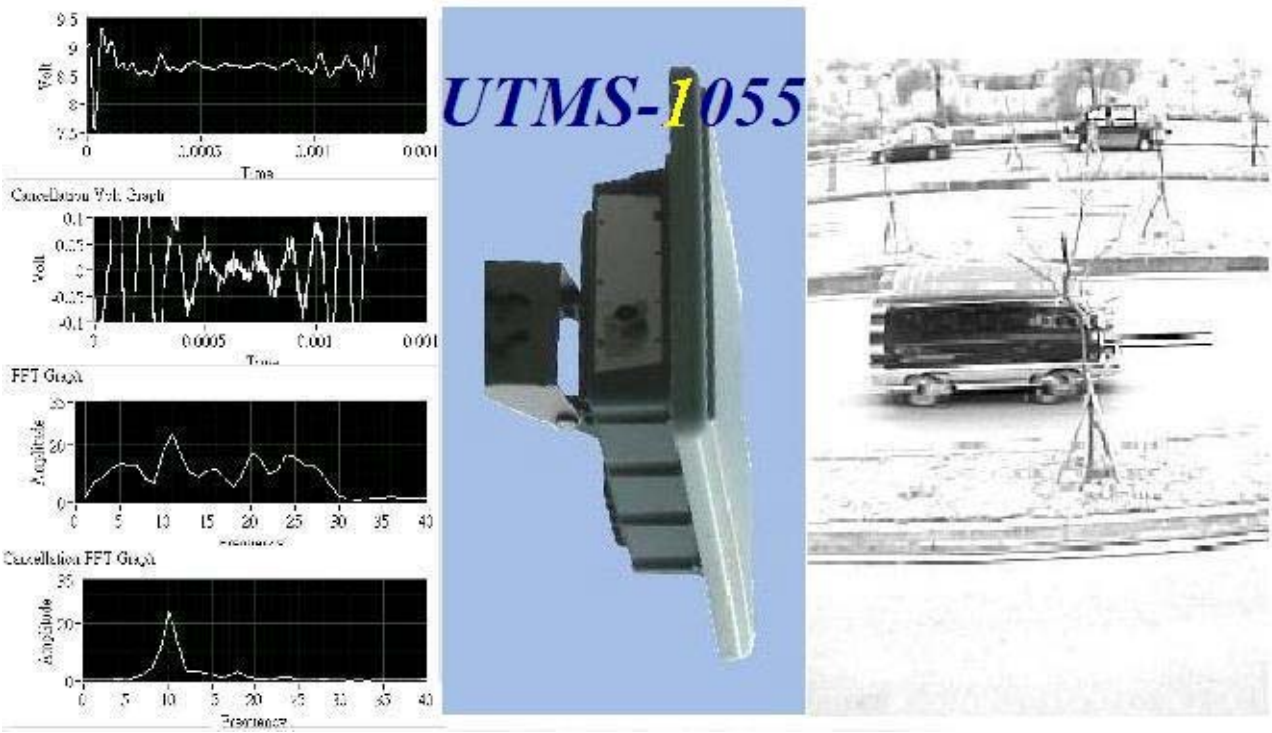
UTMS-1055

Operation Manual



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1. Introduction

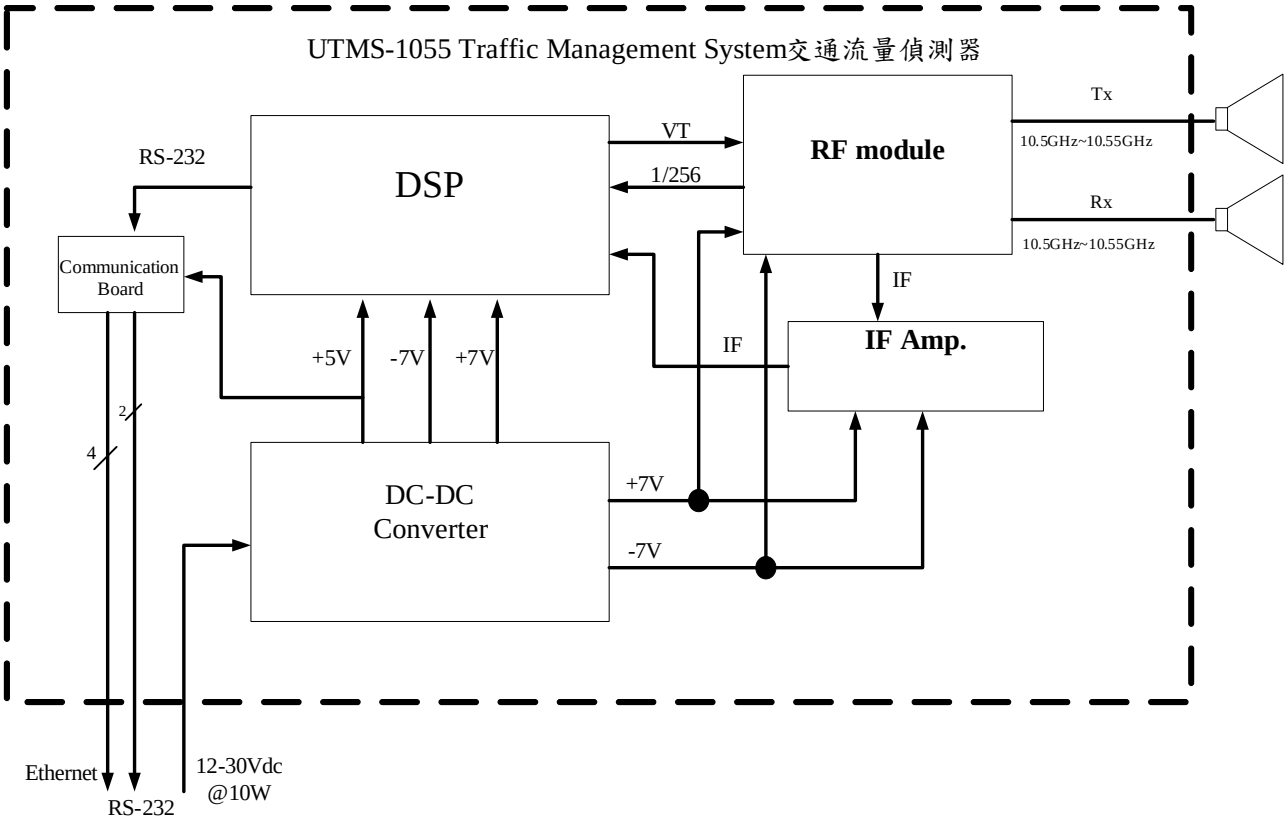
U&U successfully develops Unique Traffic Management System UTMS-1055 with FMCW target detection technology. UTMS-1055 can not only offer users to raise measurement reliability but also identify from trucks to scooters with the range of 8 lanes. The UTMS-1055 is designed to measure volume, speed of vehicles and occupancy of the road. Applications involve red-light running control and intelligence traffic management system in metropolis.

2. Function Overview

- Installed along the roadside or over the road. Detect vehicles running on 8-lane roads instantaneously.
- Available data output: Presence/Count/Classification/Speed of the vehicle and occupancy of the road.
- Target type from trucks to scooters.
- Detection range: 3～60 meter. Amplify
- Target speed range : 0～120km/hr.
- Power supply requirement: 12-30Vdc@10W.
- Data transfer by wire or GPRS.

● UTMS-1055 Structure Description

Figure 1. System Functional Block diagram



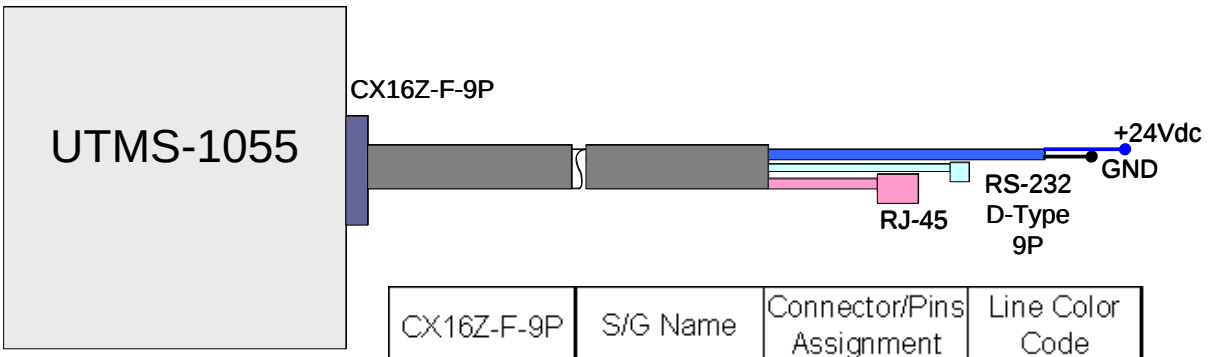
UTMS-1055 includes modules and PCA list below：

- DC-DC Converter: Convert 12-30V@10W DC power to ±7V, +5V.
- DSP(Digital Signal Processor): DSP has two major functions. One is generate VCO Tuning (VT) signal to tune the VCO of RF module. Preciously control the RF module sweep frequency with its feedback signal. The other is use its FFT function to process IF signal of the receiver output. The output data is distance and speed information of the vehicle.
- RF Module: Transmit FMCW radio wave to targets and receive the echo of them. Modulate and demodulate carrier signal and generate beat frequency of the carrier.
- IF Amplifier: Amplify and filter target intermediate frequency.
- Antenna: Use microstrip patch antenna to transmit and receive radio frequency and there is no other antenna may be used with this EUT.

- Communication Board：Support DSP to communicate with switch Hub, ADSL,GPRS modem or computer.

4. System Installation

4.1 Connection Interface



CX16Z-F-9P
F 16 Metal
Connector

CX16Z-F-9P	S/G Name	Connector/Pins Assignment	Line Color Code
P1	RS-232-RX	D-type P3	brown
P2	RS-232-TX	D-type P2	white brown
P3	Ethernet RX-	RJ-45 P6	green
P4	Ethernet RX+	RJ-45 P3	white green
P5	Ethernet TX-	RJ-45 P2	orange
P6	Ethernet TX+	RJ-45 P1	white orange
P7	Power +24Vdc	Power +24Vdc	blue
P8	Power GND	Power GND, D-type P5	White blue
P9	NC		

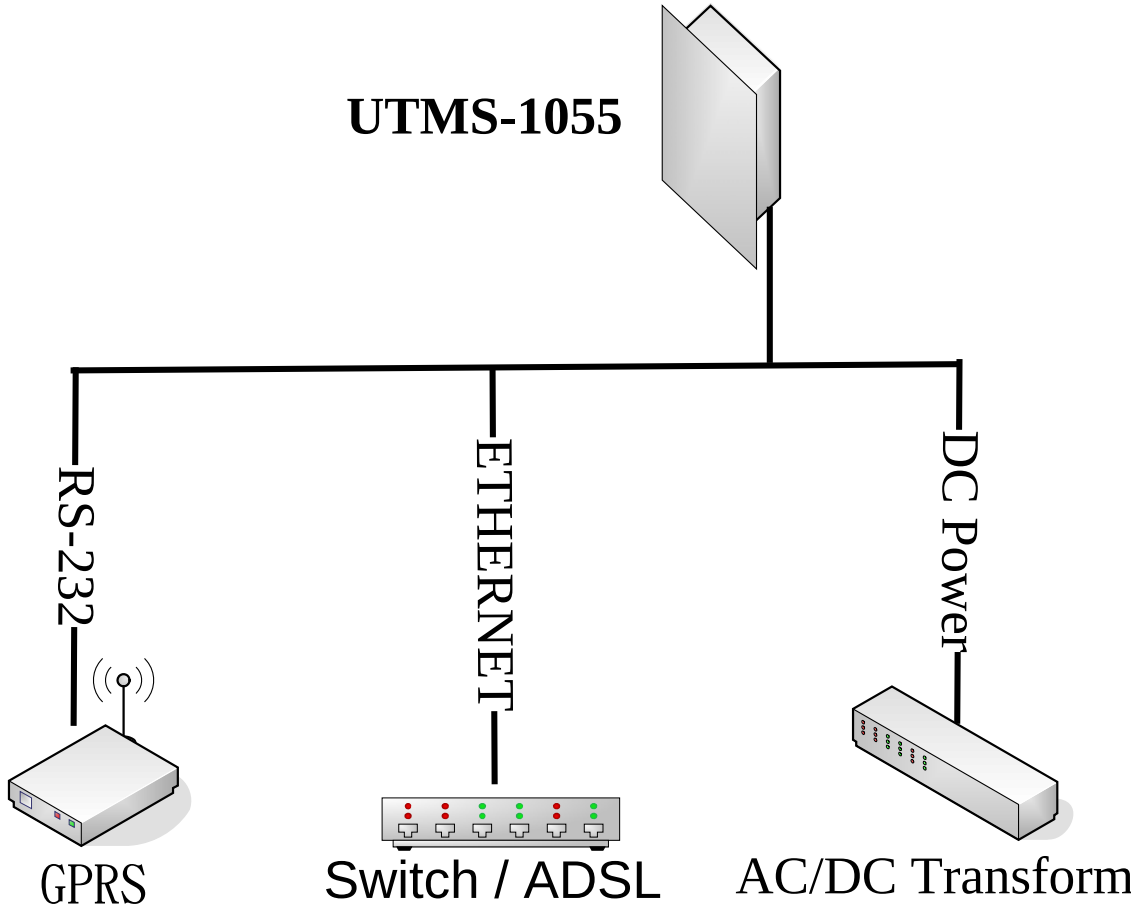
Figure 2. Interface connector pin assignment

4.2 Interface Setup

UTMS-1055 outlet includes three types of connector interfaces. Power Connector, RJ-45 and D-Type 9P.

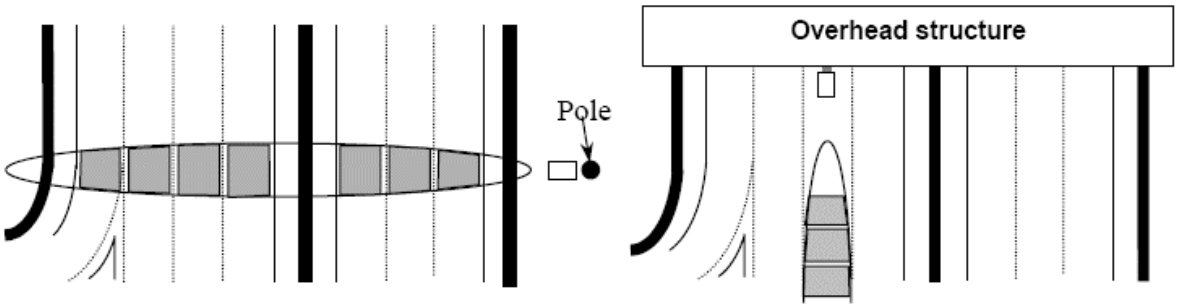
- Power Connector: Input DC voltage ranges from 12 to 30 volt and support direct current power to microwave detector.
- RJ-45 Connector: To transfer interface data by internet. For different users, RJ-45 connector can connect to Switch Hub, ADSL or computer.
- D-Type 9P Connector: Transfer interface data by RS-232; for different users, this connector can connect to GPRS modem or computer.

Figure 3. Installation block diagram



5.Installation Description

UTMS-1055 can be installed along the roadside or on overhead structures to detect vehicles running on the road. It monitors the presence/count/classification/speed of vehicle and occupancy of the road.



Side-fired Configuration

Forward-Looking Configuration

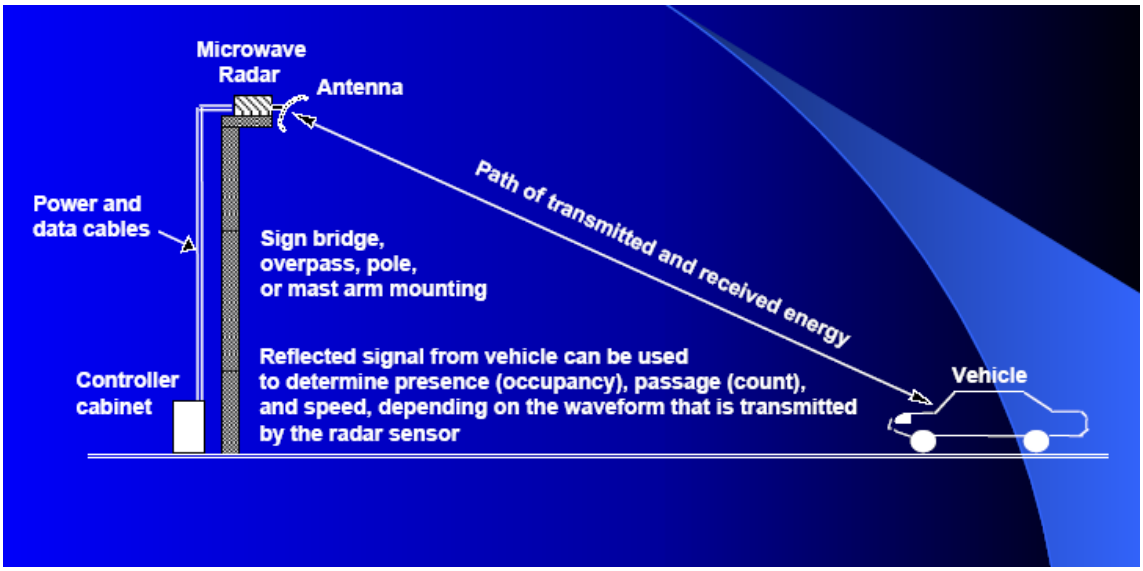


Figure 4. UTMS-1055 installation

6.UTMS-1055 Application

To improve traffic problems in urban areas and promote traffic manipulation intelligence and efficiency, we can utilize the intelligent microwave traffic sensor, UTMS-1055, to integrate original facilities, so that utility rate of roads can be raised and travel time of users can be cut down.

Therefore, we can accomplish the goal of improving traffic conditions and enhance the government’s achievements. The main applications are listed below:

- Inspect real-time traffic parameters, such as presence, count, classification, speed and occupancy to regard as the analysis foundation of traffic improvement or management.
- Integrate systems such as CMS, CCTV and so forth to provide real-time information. Through the internet, count information from UTMS-1055 will be delivered to roadside changeable signs to offer drivers the road condition ahead so that all users can respond timely.
- Combine intersection signs to optimize the control of road network. Through UTMS-1055 installed in every intersection of road network, we can observe count variation of critical pathways and dynamically control signs.
- Integrate branch lines or entries parking lots to promote efficiency of main branches.
- Integrate speed monitors to decrease traffic accidents. Through UTMS-1055 installed in each line, it will inspect speed of running cars and show whether drivers exceed the speed limit or not.

7. Technical Specification

Transceiver

- Frequency Modulation Continual Wave(FMCW)
- Center frequency: 10.525 GHz
- Swept Bandwidth: 42MHz~45MHz
- Output Power: 13-15dBm, 20m W~31.6mW
- Antenna Beam Width:
  - Azimuth：9°
  - Elevation：65°
- Detection Range：3 ~ 60m
- Detection Zones: up to 8 traffic lanes simultaneously

DSP

- TMS320C6713-300 floating-point DSP
- 512Kb flash ROM
- 256K Byte internal SRAM
- 2Mx32 external SDRAM
- Reset/Power monitor/WDT
- 16-bit AD converter – Single-channel
- 10us settling time 16-bit DA converter
  Dual-channel
- Analog Input +/- 5V Differential Input with PGA
- Analog Output +/- 5V Differential Output

- RS-485 Serial Interface(1) – Isolated
- RS-485 Serial Interface(2) – Non-Isolated

Power

- 12~ 30V DC @ 10W , 0.33~0.83A

Mechanical

- Dimension (W*D*H)： 30*30*11cm
- Weight： 2.5Kg
- Waterproofing：IP-65

Environment

- Temperature Rage: －20°C~ +75°C
- Humidity: 95%RH
- Vibration: 2g rms. up to 200Hz
- Shock: 5g @10ms half sine wave
- Wind up to 150km/h will not degrade performance
- Precipitation (rain or snow) up to 100mw/h

Warning : When the EUT is in operation, users must to maintain a distance of at least 20cm.

8. Products Service Information

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FCC ID: W4W-TMS1055

FCC Compliance and Advisory Statement

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:(1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, according to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try correct the interference by one or more of the following measures:

1.Reorient the receiving antenna.

2.Increase the separation between the equipment and receiver.

3.Connect the equipment into and outlet on a circuit different from that to which the receiver is connected.

4.Consult the dealer or an experienced radio/TV technician for help.

Any special accessories needed for compliance must be specified in the instruction manual.

Warning: A shielded-type power cord is required in order to meet FCC emission limits and also to prevent interference to the nearby radio and television reception. It is essential that only the supplied power cord be used. Use only shielded cables to connect I/O devices to this equipment.

CAUSION: Any changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate the equipment.