

DME
MAINTENANCE GUIDANCE

TOSHIBA

Revisions history

Date	Chang ed page	Changed contents	Revised by	Checked by	Approved by	Mark
June 9, 2014	-	Issued	S.Kazama	H.Shimomaki	K.Fujibayashi	-
January 26, 2016	23	Addition of Item 1.3.9 NAV Panel (Option)	K. Yoshida	Y. Saito	Y. Nakagawa	A
April 07,2017	6,37	Removed Outside 10dB Attenuator Changed MON Unit [S2] Setting	N. Oomori	Y. Saito	Y. Nakagawa	B
September 11, 2017	Last page	Deleted CE Marking Added DoC	N. Oomori	Y. Saito	Y. Nakagawa	C

MAINTENANCE GUIDANCE

Chapters

Chapter 1 Check method

Chapter 2 Periodical replacement parts

Chapter 3 Repairing mechanical parts

Chapter 4 Trouble shooting

MAINTENANCE GUIDANCE

Table of contents

CHAPTER 1 Check method	1
1 Check method.....	1
1.1 Overview	1
1.2 Periodical check	3
1.2.1 Testers.....	3
1.3 Electric check items	4
1.3.1 LED	5
1.3.2 LCD Unit.....	7
1.3.3 DC Unit	9
1.3.4 CONT Unit.....	11
1.3.5 TRX Unit.....	14
1.3.6 MON Unit	23
1.3.7 HPA Unit	28
1.3.8 RCMS.....	30
1.3.9 NAV Panel (Option)	31
1.3.10 Cable	32
1.4 Default of each unit	33
1.4.1 Default of CONT Unit.....	33
1.4.2 Default of TRX Unit.....	35
1.4.3 Default of MON Unit	37
1.4.4 Default of HPA Unit	39
1.5 Software	41
1.5.1 RCMS software	42
1.5.1.1 Installing RCMS software	42
1.5.1.1.1 Full installation.....	44
1.5.1.1.2 Installation only RCMS.....	52
1.5.1.1.3 Installation is complete.....	53
1.5.1.2 Uninstalling RCMS software	54
1.5.1.3 RCMS environment setting	55
1.5.1.3.1 Network setting of RCMS	55
1.5.1.3.2 Port number setting of RCMS	57
1.5.1.4 Start of RCMS	59
1.6 Mechanical check items	62

CHAPTER 2 Periodical replacement parts	63
2 Periodical replacement parts	63
CHAPTER 3 Repairing mechanical parts	63
3 Repairing mechanical parts	64
CHAPTER 4 Trouble shooting	65
4 Trouble shooting.....	65
4.1 Overview	68
4.2 Trouble shooting by symptom.....	69
4.2.1 SYS DLY (System Delay) Alarm	69
4.2.2 PLS SPACE (Pulse Space) Alarm	70
4.2.3 SENS (Sensitivity) Alarm	71
4.2.4 TX RATE (TX Pulse Rate) Alarm.....	72
4.2.5 TX PWR (TX Power) Alarm.....	73
4.2.6 ID Alarm.....	74
4.2.7 Control and monitoring action	75
4.3 Trouble shooting by component.....	76
4.3.1 CONT Unit.....	76
4.3.2 HPA Unit	77
4.3.3 TRX Unit.....	78
4.3.4 MON Unit	79
4.3.5 DC Unit	80
4.3.6 LCD Unit.....	81
4.3.7 Power Supply	82
4.3.8 RCMS.....	83

Safety Precautions

1. Danger prevention

The equipment has a high-tension cubicle, a charger and batteries where large currents flow so that they are very dangerous. Before doing maintenance work, be sure to switch the power off and let the capacitors discharge.

When making adjustments or measuring high voltage, put one of your hands in the pocket, for example, so that most of the your body will not be exposed to the electric circuits at the same time. It is advised that work be performed not by a single person.

2. Measures Against Electric Shock

- (1) If any one gets an electric shock, immediately switch the power off, and ground that circuit concerned. If it is not possible to switch the power off, remove the victim from the electrical conductor as quickly as possible by using a belt, dry towel, or a piece of wooden board.

- (2) If a strong electric current run through the body, the respiratory nervous center under the brains might be struck, resulting possibly in a sudden stoppage of breathing, irregular pulsation, and falling into unconsciousness. By immediately taking such steps as artificial breathing and heart massaging correctly and patiently, the victim will return to normal in most cases.

Never be upset or give up, taking him as dead.

- (3) To see whether the victim is breathing, lay him his face up, see if the chest and abdomens move.

To check whether the heart is beating, touch the neck artery with your finger. If he is not breathing, try artificial breathing. If the heart is not beating, massage the heart. Whichever the case take action as soon as possible.

If both breathing and heart beating have stopped, conduct artificial breathing and heart massaging simultaneously.

3. First Aid

(1) Important Points

- a. Do artificial breather and/or heart massaging on the spot.
- b. Do not roughly carry the victim
- c. Contact the doctor quickly.

(2) Artificial Breathing

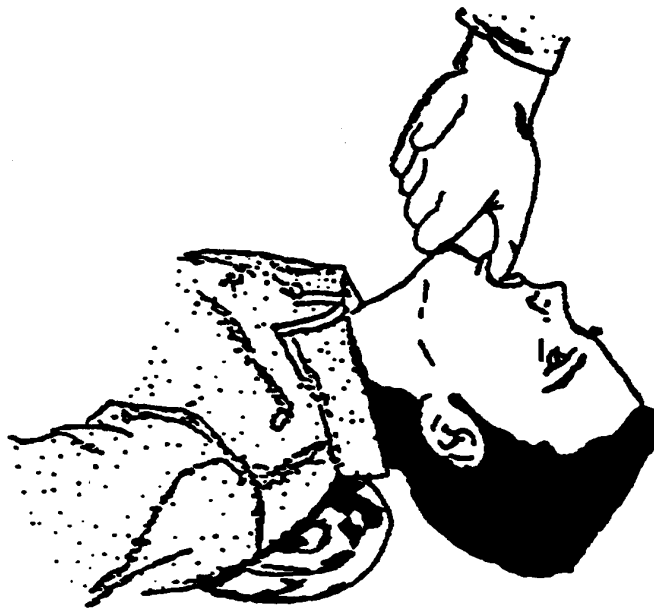
Mouth-to-mouth resuscitation

- a. The victim is likely to be unconscious. Pull his chin up to expand the respiratory tube.

(Figure 1)

- b. Then watch the move of the chest and abdomens.

If they are still start artificial breathing at once.



- (1) Pull the chin up, and the head down.

- (2) Place a blanket on the Pack.

Figure 1

- c. Pinch the nose of the victim with the thumb and index finger of one hand so that air will not leak from the nose.

Hold the back of the head with the other hand, and raise it. (Figure 2)

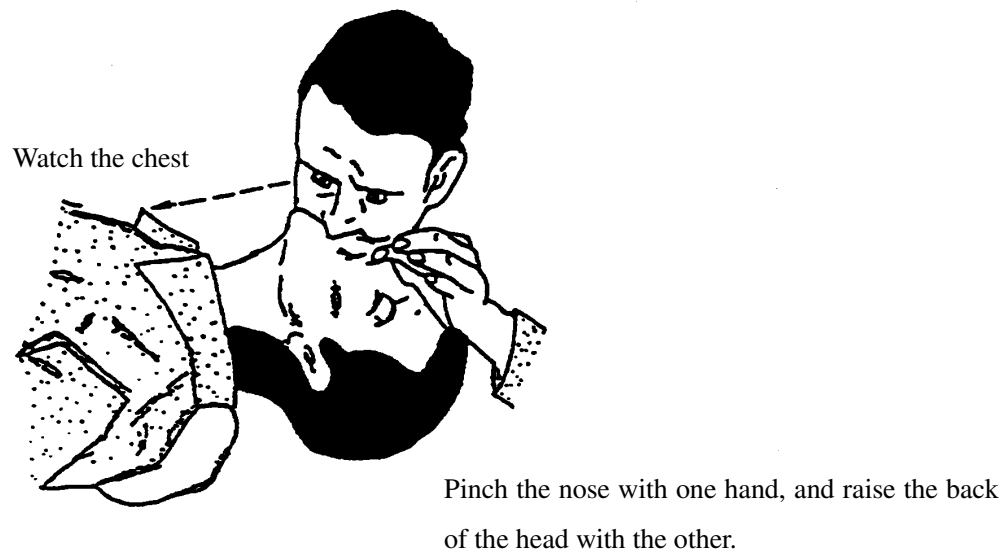


Figure 2

d. With your mouth on the mouth of the victim, blow into his heart while watching the chest.

Open your mouth wide each time you breathe into his heart, taking care not to let air leak.

e. Leave your mouth from his each time you blow, but keep his nose pinched with your hand.

f. For the first few times, blow a little hard about one half the amount of a deep breath (about 1 liter); and then blow at a rate of about 12 times per minute.

g. Each time you blow, be sure to check that the chest of victim swells. (Practice this well, using a doll, for example.)

(3) Closed chest type heart massage

If the heart is not beating, it is necessary to bring it back to work again as soon as possible. This is a very effective method of bringing the heart back to work by pressing it from the outside.

a. Do it quickly.

b. Lay the victim down, his face up, on a floor, table or a hard place.

- c. Place the bottom part of the palm of one hand about one-third away from the lowest rib, and put the other hand on it.
- d. Without bending the elbow, press lightly with the weight of your body until the chest of the victim is depressed about 4 to 8cm and immediately release the hands. (Figure 3)
And when pressed by hand, the heart shrinks so the blood in it is pushed out.

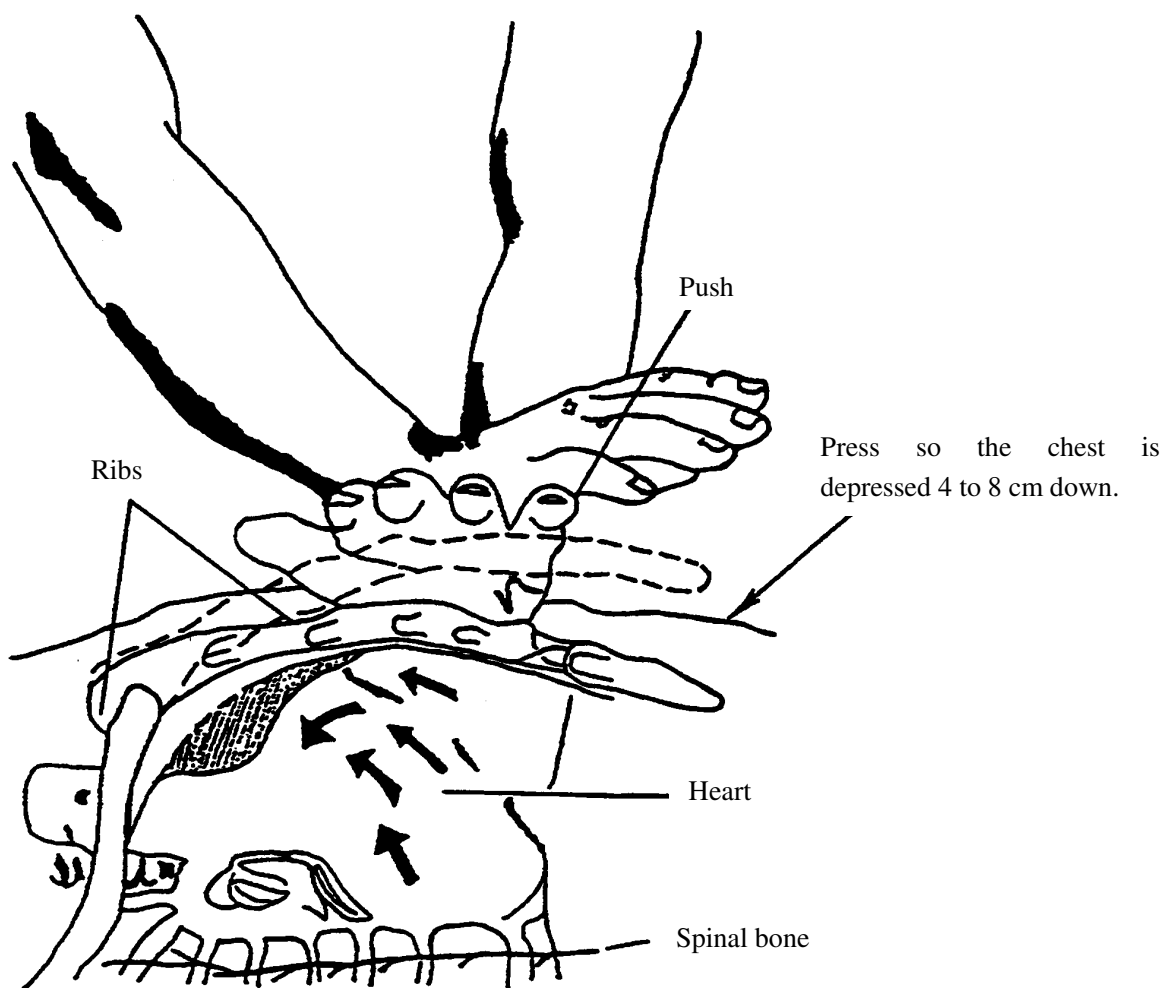


Figure 3 The Chest Depressed by Hands

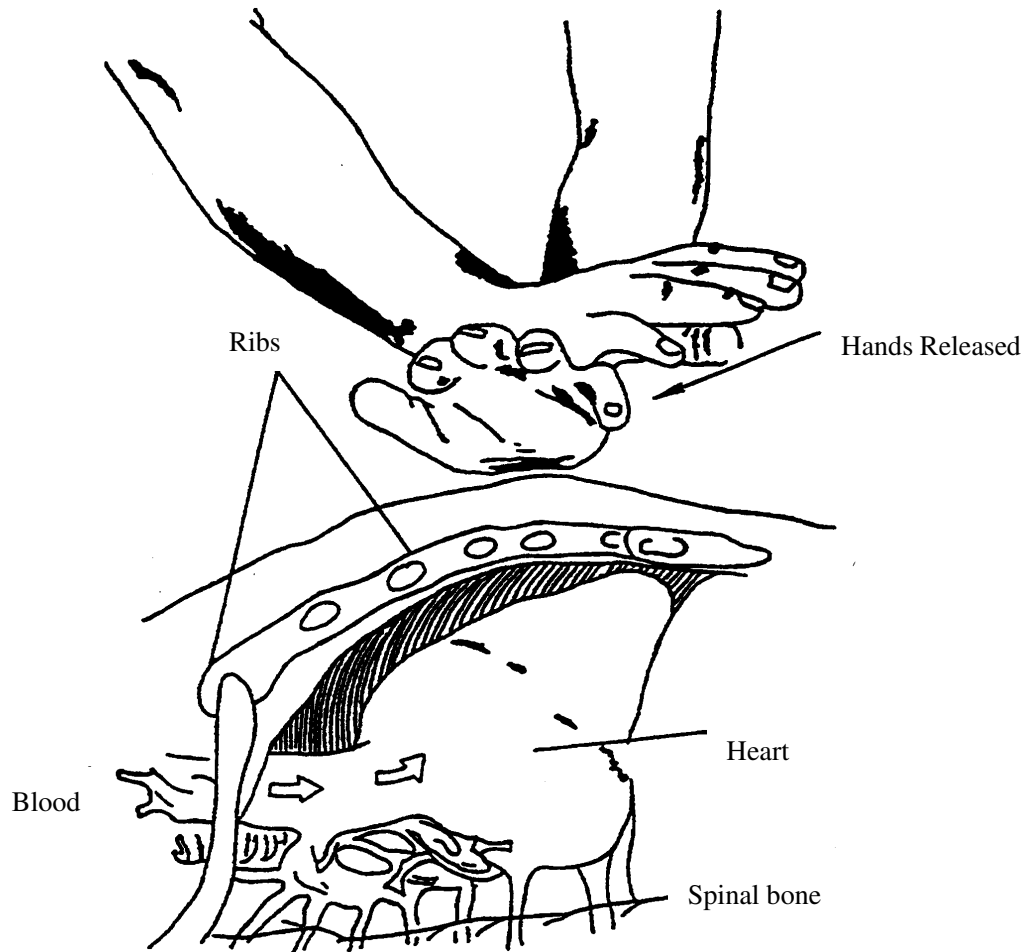


Figure 4 Hands Released

- e. Repeat this process rhythmically at a rate of about once every second. Never do it impulsively.
- f. If the chest is pressed too hard, the ribs might be broken.
- g. Heart massage should be done simultaneously with mouth-to-mouth resuscitation at the ratio of 15 heart massages to 2 artificial breathings.
- h. If there are two persons available, one should do heart massage, and the other artificial breathing. (Figure 5) In this case, the ratio of heart massage to artificial breathing should be 5 to 1.

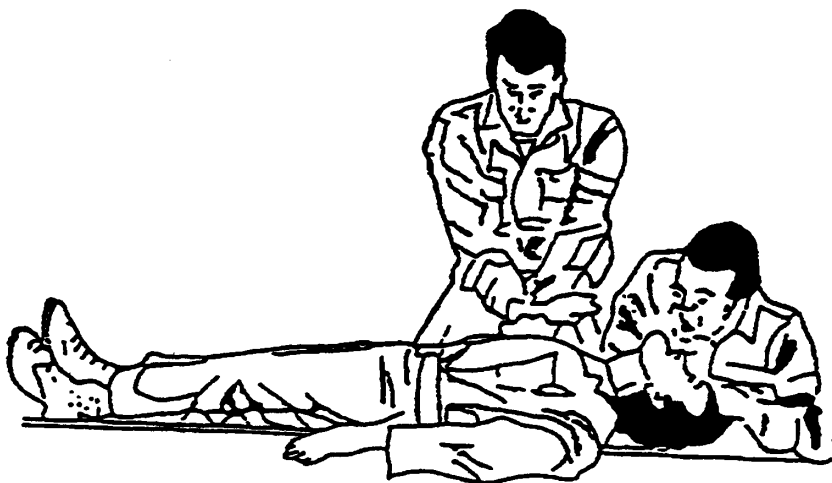


Figure 5 Heart Massage and Artificial Breathing by Persons

4. Other Precautions

- (1) The victim must be taken to the hospital or clinic as soon as possible. While he is on the stretcher, or in an ambulance, keep massaging the heart and artificial resuscitation.
- (2) When the victim begins to naturally breathe again, or his hands and feet are warm again, or his pulses can be felt again, wrap him with a blanket to keep him warm and quiet.
- (3) If he is still unconscious while his heart and breathing are back to normal, keep him on the side to maintain his respiratory tube wide so that he will not be choked by something vomited, nor be suffocated again.
- (4) Have him examined by the doctor as soon as possible.

For safe operation and maintenance work

Important precautions

Safe handling of the DME

Be sure to fully understand this manual and all related document before operating and servicing the DME.

Not doing so may cause failure or accident due to inappropriate use of the DME.

This manual should be always available for workers.

“DANGER,” “CAUTION” and “NOTE” show important issues to prevent failures and accidents in the relevant pages of this manual. Be sure to read them before using the DME.

Explanation of symbols in this manual

DANGER

Misuse of equipment may cause serious human injury or death.

Or, electric wave is stopped and the DME is down.

Remarks: Aftereffect of vision loss, injury, burn wound, bone fracture, electrical shock, etc. may require hospital admission or long-term hospital visit. Stopped electric wave may be an obstacle for aircrafts in flight and hinder safety of their flight.

CAUTION

Misuse of equipment may cause dangerous condition, slight human injury and property damage.

Remarks: This may cause burn wound and electric shock requiring medical treatment or hospital visit.

Damaged property may break equipment.

NOTE

Instructions to prevent mechanical damage to secure optimum performance

CHAPTER 1 Check method

1 Check method

1.1 Overview

Maintenance guidance shows smooth maintenance of DME (hereinafter referred to as “this device”).

This device should be serviced regularly. Approved maintenance personnel who well know this device should check this device in order to prevent operational errors.

Service this device after confirming this device is surely grounded.

NOTE

It is required to well understand each operational section by reading operational manual and marking of operational sections.

Configuration

Chapter1 Check method.....Shows common items required for servicing.

Chapter2 Periodical replacement parts.....Shows criteria of periodical replacement parts.

Maintenance personnel should well understand the Operation guidance and the Maintenance guidance to maintain favorable condition of this device.

 DANGER

Gain agreement with the authorities concerned before stopping the transmission system. Stopping transmission without permission may hinder aircrafts in flight and be destructive to the security of their flights.

 DANGER

This device includes life-threatening high current and high-frequency current. Therefore, never fail to confirm other persons are not working before any kinds of operation. When you perform maintenance or adjustment, maintenance personnel should report work plan so that other persons would not operate from other areas. Additionally, secure your safety by shifting to local control or bypassing transmission system.

 CAUTION

- (1) Stop this device in accordance with shutoff procedure. Confirm all switches of the Breaker Panel, breaker of power unit (if installed separately) and distribution board are turned off. Additionally, take precautions such as display and fixture so that switches of the Breaker Panel, breaker of power unit and distribution board would not be turned on.
- (2) When removing an antenna separately installed, remove power cable first and grounding cable must not be removed.
- (3) Connect grounding before connecting power cable.
Remove grounding after disconnecting power cable.

1.2 Periodical check

Perform constant or periodical check so that this device functions in the best condition.

Periodical checks prevent serious failures and make operating life of this device longer. The categories in the electric check item table and mechanical check item table indicates check cycle and the following symbols are used.

Category	Check cycle	Confirmation before check
<S>	Daily	
<A>	Weekly	Press the [TEST LED] of the Breaker Panel to test the LED.
		Check each controlling condition.
	1-1.5 month	For items normal in the A check.
<C>	6 months	
<D>	12 months	

<S>: In S check, confirm the device functions normally by checking RCMS on the remote side.

<A>: In A check, most items are checked visually and with testers. Check by turning ON/OFF switch if the item has a switch.

: In B check, confirm output waveforms and transmission frequencies using various testers.

<C>: There is no C check.

<D>: In D check, the conditions of cables connected to each device are checked.

1.2.1 Testers

Testing equipment required for checks will be described.

1.2.1.1 Testing equipment

Testing equipment is required for checking this device. Read instruction manual for using this testing equipment correctly. Be sure not to break testing equipment by erroneous operations. Check devices with testing equipment having prescribed performance. For that purpose, regular calibration should be performed on testing equipment. The testing equipment used for this device is shown in the TEST EQ LIST (Item II of Adjustment guidance) separately.

1.3 Electric check items

Test points, electric check items, check method and adjustment method of each component will be described.

- (1) For test points, the uses of monitor terminals and check terminals positioned on the front panel of each unit will be described.
- (2) Major purposes of electrical check items include confirming waveform of monitor terminals, level of check terminal, LED displays and dial indicators mounted on the front panel of each unit.
- (3) The check instruction briefly describes, based on check item table, check methods, used testers and procedures.
- (4) Adjustment instruction describes adjustment methods of sections considered to be adjusted in electric check. In adjustment, testers shown in section 1.2.1 or the TEST EQ LIST (Item II of Adjustment guidance) are used. Confirm they function normally before adjustment.

Refer to the operational instructions for adjustments.

DANGER

Take note that some adjustments require stopping electric wave.

CAUTION

Spare parts should be kept in the place where temperature and humidity is controlled.

1.3.1 LED

1.3.1.1 LED electric check item table

Table 1.3.1.1-1 LED electric check item

Number/item/category	Overview of check	Criteria	Check method	Adjustment method
1.3.1.1.1 Check of display status <A>	Press the [TEST LED] of the Breaker Panel to confirm LED display status.	All units should light up.	See 1.3.1.2.1	-

1.3.1.2 LED Check instruction

1.3.1.2.1 Confirmation of LED display status.

(1) Measurement device

Not required

(2) Check method

(2-1) Press the [TEST LED] switch of the Breaker Panel to confirm LED display status of each unit.

1.3.2 Transmitter Power measurement and waveform

1.3.2.1 Transmitter Power measurement electric check item table

Table 1.3.2.1-1 Transmitter Power measurement electric check item

Number/item/category	Overview of check	Criteria	Check method	Adjustment method
1.3.2.1.1 Check of Transmitter Power measurement 	Connect a peak power meter to the front check terminal [STBY MON] of DME equipment.	That the transmit output power is within the standard value.	See 1.3.2.2.1	See 1.3.6.5
1.3.2.1.2 Check of Transmitter waveform 	Connect a detector and oscilloscope to the front check terminal [STBY MON] of DME equipment.	Transmit pulse waveform monitor is within the standard value.	See 1.3.2.3.1	See 1.3.6.5

1.3.2.2 Transmitter Power measurement Check method

1.3.2.2.1 Check of Transmitter Power measurement.

(1) Used measuring instrument

Peak power meter

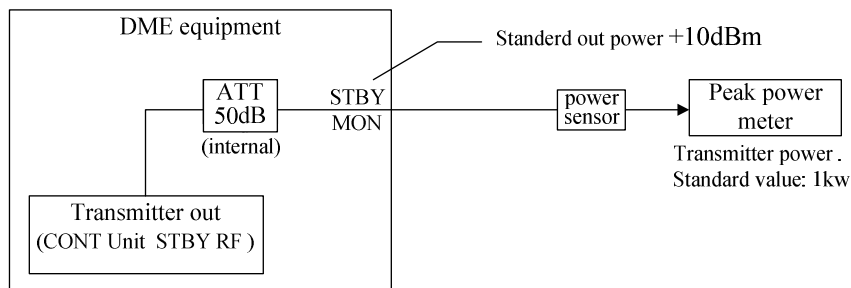
(2) Check method

(2-1) Connect a peak power meter to the front check terminal [STBY MON] of DME equipment.

(2-2) LCD Unit setting is below.

Main screen: [ALM BYP] and [STBY MNT] - ON.

(2-3) Confirm that the transmit output power is within the standard value by using a peak power meter.



1.3.2.3 Transmitter pulse waveform Check method

1.3.2.3.1 Check of Transmitter pulse waveform

(1) Used measuring instrument

Diode detector and Oscilloscope

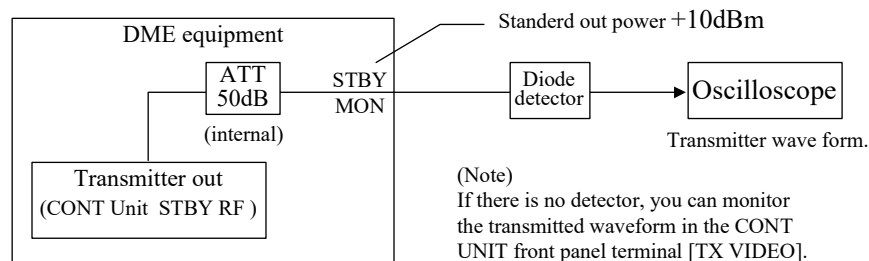
(2) Check method

(2-1) Connect a peak power meter to the front check terminal [STBY MON] of DME equipment.

(2-2) LCD Unit setting is below.

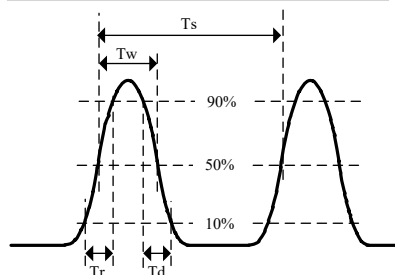
Main screen: [ALM BYP] and [STBY MNT] - ON.

(2-3) Confirm that the transmit pulse waveform monitor is within the standard value by using an oscilloscope.



(Note)

If there is no detector, you can monitor the transmitted waveform in the CONT UNIT front panel terminal [TX VIDEO].



Standard value

Ts: Pulse space
 X-mode: $12 \pm 0.25 \mu s$
 Y-mode: $30 \pm 0.25 \mu s$
 Tw: Pulse width
 $3.5 \pm 0.5 \mu s$
 Tr: Pulse rise time
 $1.5 \text{ to } 3.0 \mu s$
 Td: Pulse decay time
 $1.5 \text{ to } 3.0 \mu s$

1.3.3 LCD Unit

1.3.3.1 LCD Unit electric check item table

Table 1.3.3.1-1 LCD Unit electric check item

Number/item/category	Overview of check	Setting criteria	Check method	Adjustment method
1.3.3.1.1 Confirmation of display status <A>	Confirm that LCD panel displays characters and colors. Turn off the screen-saver by touching the screen if any.	LCD panel should display numbers and colors. They should coincide with the current operation status of the device. No alarm should be displayed.	See 1.3.3.2.1	-
1.3.3.1.2 Confirmation of display Measurement values <A>	Confirm that LCD panel displays Measurement values	It measured the display value is not a large difference from an initial value at the time of installation.	See 1.3.3.2.2	See 1.3.7.4

1.3.3.2 LCD Unit check method

1.3.3.2.1 Confirmation of LCD Unit display status

(1) Measuring device

Not required

(2) Check method

(2-1) Turn off screen saver by touching the screen if it is ON.

(2-2) Confirm that the LED panel display characters and colors.

(2-3) Confirm that LEDs coincide with the current operational status of the device.

(2-4) Confirm that no alarm is displayed.

1.3.3.2.2 Confirmation of LCD Unit display Measurement values

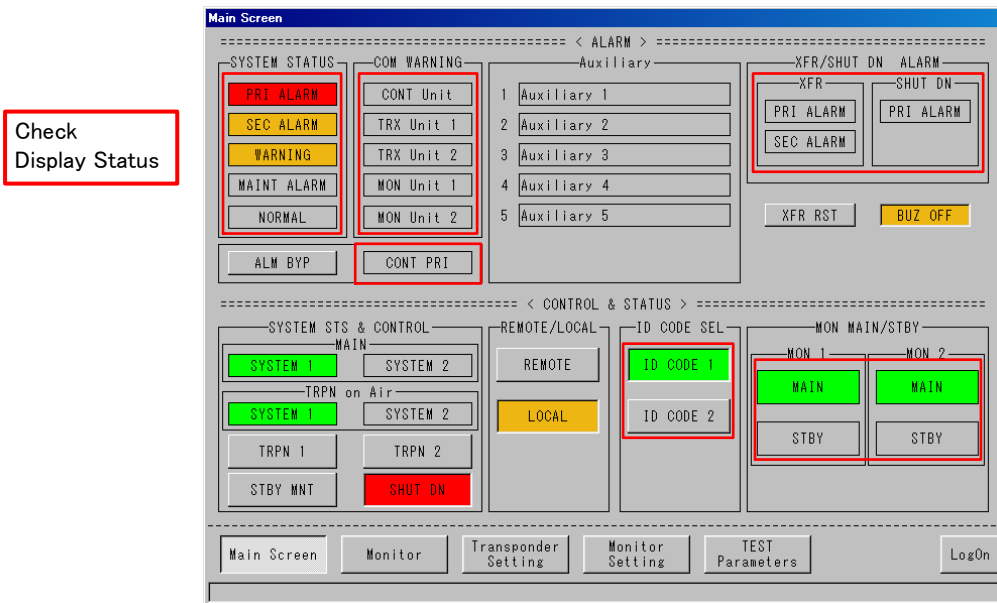
(1) Measuring device

Not required

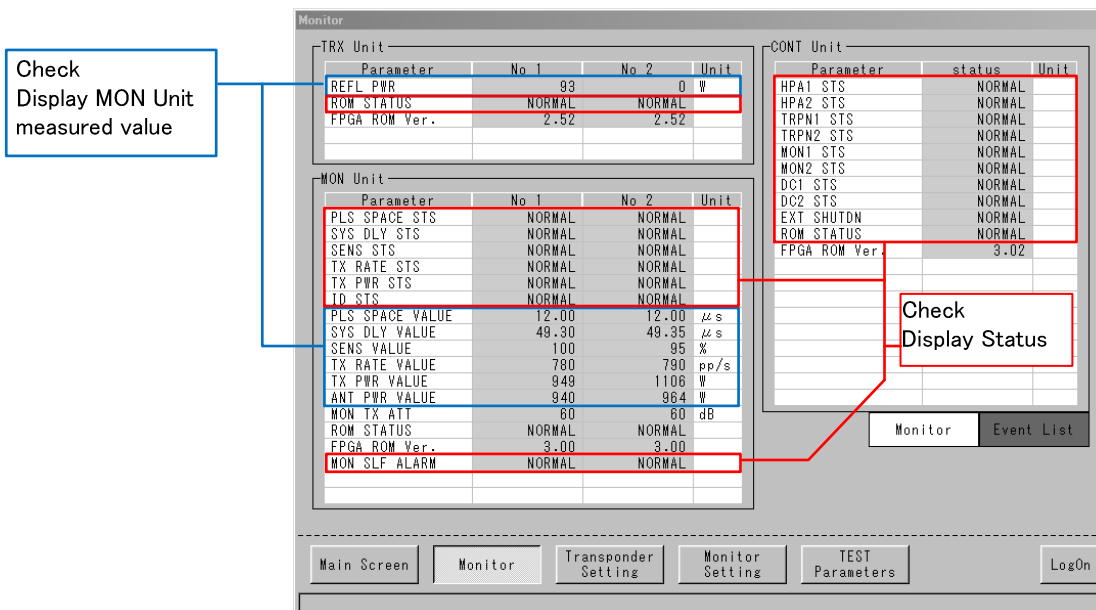
(2) Check method

The measured value of MON Unit is not significantly different from initial setting.

For example LCD Unit MAIN Screen



For example LCD Unit Monitor Screen



1.3.4 DC Unit

1.3.4.1 DC Unit test point table

Table 1.3.4.1-1 DC Unit test points

Component	Test point name	Descriptions
DC Unit	+48V	+48V output voltage Output voltage: $+48V \pm 2.4V$
	+24V	+24V output voltage Output voltage: $+24V \pm 1.2V$
	+5V	+5V output voltage Output voltage: $+5V \pm 0.5V$

1.3.4.2 DC Unit electric check item table

Table 1.3.4.2-1 DC Unit electrical check item

Number/item/category	Overview of check	Setting criteria	Check method	Adjustment method
1.3.4.2.1 Confirmation of display status 	Check display status of LED [ALM].	It should be turned off.	See 1.3.4.3.1	-
1.3.4.2.2 Confirmation of display status 	Check the display of LED [+48V] [+24V] and [+5V].	They should be turned on in green.	See 1.3.4.3.1	-
1.3.4.2.3 +48V output voltage 	Measure by connecting the tester to the front check terminal [+48V].	$+48V \pm 2.4V$	See 1.3.4.3.2	-
1.3.4.2.4 +24V output voltage 	Measure by connecting the tester to the front check terminal [+24V].	$+24V \pm 1.2V$	See 1.3.4.3.3	-
1.3.4.2.5 +5V output voltage 	Measure by connecting the tester to the front check terminal [+5V].	$+5V \pm 0.5V$	See 1.3.4.3.4	-

1.3.4.3 DC Unit Check method

1.3.4.3.1 Check of DC Unit display status

(1) Measuring instrument

Not required.

(2) Check method

(2-1) Check [ALM] LED display status.

(2-2) Check [+48V] LED display status.

(2-3) Check [+24V] LED display status.

(2-4) Check [+5V] LED display status.

1.3.4.3.2 Checking +48V output voltage of the DC Unit

(1) Used measurement instrument

Tester

(2) Check method

(2-1) Check at the front check terminal [+48V] using a tester.

1.3.4.3.3 Check of DC Unit +24V output voltage

(1) Used measuring instrument

Tester

(2) Check method

(2-1) Check the front check terminal [+24V] by using a tester.

1.3.4.3.4 Check of DC Unit +5V output voltage

(1) Used measuring instrument

Tester

(2) Check method

(2-1) Measure at the front check terminal [+5V] by using a tester.

1.3.5 CONT Unit

1.3.5.1 CONT Unit electric check item table

Table 1.3.5.1-1 CONT Unit electric check items

Number/Item/Category	Overview of check	Setting criteria	Check method	Adjustment method
1.3.5.1.1 Check of display status <A>	Check display status of LED [PRI ALM] [SEC ALM] [XFR] [SHUT DN] [ALM BYP] and [LCL CNT].	Alarm should be turned off. They should be turned off in normal operation.	See 1.3.5.2.1	-
1.3.5.1.2 Check of display status <A>	Check display status of LED [MAIN][SYS1] [MAIN][SYS2] [TRPN ON AIR][SYS1] [TRPN ON AIR][SYS2] [TRPN ON AIR][TRPN1] [TRPN ON AIR][TRPN2] [MON1] [MON2] [ID1] and [ID2].	[SYS1] should be [MAIN] in normal operation. Either one of [SYS] should be turned on and either one of [TRPN] should be turned on. They should be turned on in normal operation. Either one of them should be turned on.	See 1.3.5.2.1	-
1.3.5.1.3 Check of display status <A>	Check display status of LED [WRITE PROTECT OFF]	Should be turned on in normal operation.	See 1.3.5.2.1	-
1.3.5.1.4 Check of TX VIDEO Transmit pulse shape 	Observe it on an oscilloscope connected to the front check terminal [TX VIDEO]	Transmit pulse waveform monitor	See 1.3.5.2.2	-
1.3.5.1.5 Check of REFL VIDEO <C>	Observe it on an oscilloscope connected to the front check terminal [REFL VIDEO]	Transmit pulse Reflect power waveform monitor	See 1.3.5.2.3	-

1.3.5.2 CONT Unit Check method

1.3.5.2.1 Check of CONT Unit display status

(1) Used measuring instrument

Not required

(2) Check method

(2-1) Check display status of [PRI ALM] LED.

(2-2) Check display status of [SEC ALM] LED.

(2-3) Check display status of [XFR] LED.

(2-4) Check display status of [SHUT DN] LED.

(2-5) Check display status of [ALM BYP] LED.

(2-6) Check display status of [LCL CNT] LED.

(2-7) Check display status of [MAIN] [SYS1]/ [SYS2] LED.

(2-8) Check display status of [TRPN ON AIR] [SYS1]/ [SYS2] LED.

(2-9) Check display status of [TRPN ON AIR] [TRPN1]/ [TRPN2] LED.

(2-10) Check display status of [MON1]/ [MON2] LED.

(2-11) Check display status of [ID1]/ [ID2] LED.

(2-12) Check display status of [WRITE PROTECT OFF] LED.

1.3.5.2.2 Check of TX VIDEO waveform

(1) Used measuring instrument

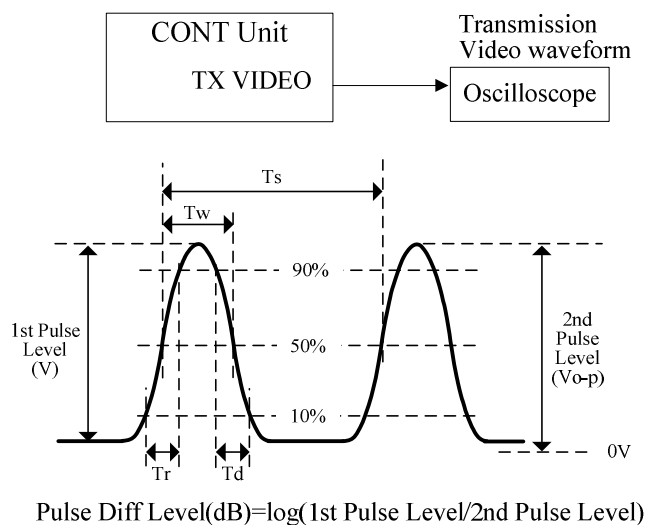
Oscilloscope

(2) Check method

(2-1) Connect an oscilloscope to the front check terminal [TX VIDEO].

(2-2) Turn on the transmitter by operating LCD Unit.

(2-3) Confirm that the transmitted pulse waveform is within the standard by using oscilloscope.



Standard value

Ts: Pulse space

X-mode: $12 \pm 0.25 \mu s$

Y-mode: $30 \pm 0.25 \mu s$

Tw: Pulse width

$3.5 \pm 0.5 \mu s$

Tr: Pulse rise time

1.5 to $3.0 \mu s$

Td: Pulse decay time

1.5 to $3.0 \mu s$

Pulse Diff level

Less than 1dB

Pulse Level

Initial installation value

(Note)

Pulse level is typically about 2V is

Transmission power of 1kW.

See Figure 1.3.5.2

1.3.5.2.3 Check of REFL VIDEO waveform

(1) Used measuring instrument

Oscilloscope

(2) Check method

(2-1) Connect an oscilloscope to the front check terminal [REFL VIDEO].

(2-2) Turn on the transmitter by operating LCD Unit. .

(2-3) Confirm that the transmitted pulse waveform is within the standard by using oscilloscope.

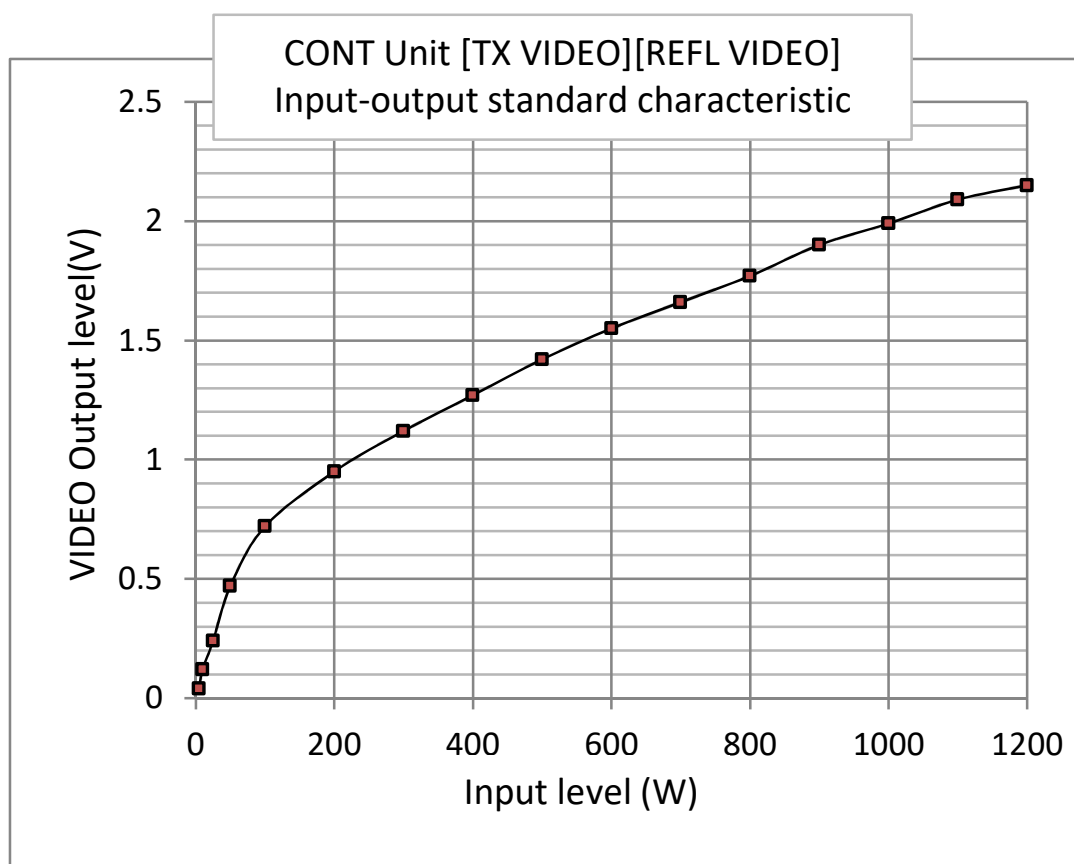
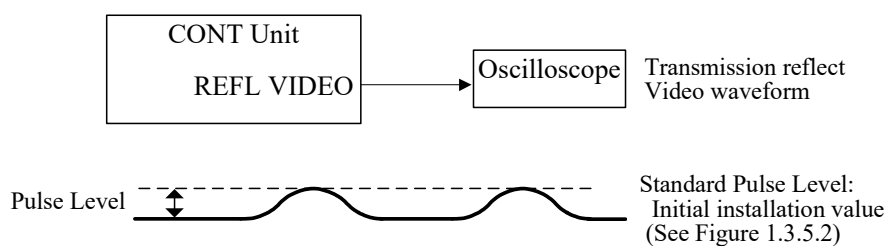


Figure 1.3.5.2

1.3.6 TRX Unit

1.3.6.1 TRX Unit test point table

Table 1.3.6.1-1 TRX Unit test point

Component	Test point name	Description
TRX Unit	RF CW	Transmit frequency monitor output
	TX VIDEO	Transmit modulation pulse waveform monitor output (Gauss pulse + Pedestal DC)
	PAIR PLS DET	Interrogation pair pulse receive detection signal output
	RX VIDEO	Receive pulse waveform pulse monitor output (before receipt filter)
	RX PLS MON	Receive pulse waveform pulse monitor output (latter receipt filter)
	ID	ID keying code signal monitor output (Morse code)
	RF OUT MON	TRX Unit transmit (50~100W) signal monitor output (Coupler 40dB)

1.3.6.2 TRX Unit Electric check item table

Table 1.3.6.2-1 TRX Unit electric check item (1/2)

Number/Item/Category	Overview of check	Setting criteria	Check method	Adjustment method
1.3.6.2.1 Check of display status <A>	Check display status of LED [ALM] and [TRPN ON]. Check display status of LED [ID].	Should be turned off. TRX Unit on operating side is turned on. Should be turned on when sending ID of TRX Unit on operating side.	See 1.3.6.4.1	-
1.3.6.2.2 Check of transmit frequency of TRX Unit 	Measure by connecting a frequency counter to the front check terminal [RF CW].	Transmit frequency error ± 20 ppm or less	See 1.3.6.4.2	-
1.3.6.2.3 Observation of transmitted modulation pulse waveform <C>	Measure it by connecting an oscilloscope to the front check terminal [TX TRG] and [TX VIDEO].	The output signal is synchronized. Modulated signal level is standard value.	See 1.3.6.4.3	See 1.3.6.5.1
1.3.6.2.4 Observation of pair pulse detection signal <C>	Measure it by connecting an oscilloscope to the front check terminal [RX VIDEO] [PLS DET] [PAIR PLS DET] and [DEAD TIME SIG].	The output signal is synchronized. Modulated signal level is standard value.	See 1.3.6.4.4	-
1.3.6.2.5 Check ID CODE <C>	Measure it by connecting an oscilloscope to the front check terminal [ID].	Waveform of ID should be within standard. And check the ID tone.	See 1.3.6.4.5	-
1.3.6.3 Check TRX Unit transmit power <C>	Measure it by connecting a Peak power meter to the front check terminal [RF OUT MON].	Transmit power should be initial installation value.	See 1.3.6.4.6	-

Table 1.3.6.3-1 TRX Unit electric check item (2/2)

Number/Item/Category	Overview of check	Setting criteria	Check method	Adjustment method
1.3.6.3.1 Check of TRX Unit Receive sensitivity <C>	[STBY MANT] and TRPN TEST mode setting by LCD Unit.	[STBY MANT] and TRPN TEST mode setting by LCD Unit. The interrogator SG level is varied. It asked the reception sensitivity of the TRX Unit, be in the standard value.	See 1.3.6.4.7	-

1.3.6.4 TRX Unit Check method

1.3.6.4.1 Check of TRX Unit display status

(1) Used measuring instrument

Not required.

(2) Check method

(2-1) Check display status of [ALM] LED.

(2-2) Check display status of [TRPN ON] LED.

(2-3) Check display status of [ID] LED.

1.3.6.4.2 Check of transmit frequency of TRX Unit

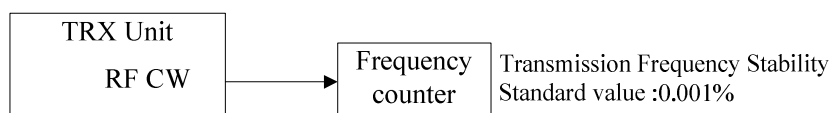
(1) Used measuring instrument

Frequency counter

(2) Check method

(2-1) Connect a frequency counter to the front check terminal [RF CW].

(2-2) Confirm that the transmit frequency accuracy is within standard by using frequency counter.



$$\text{Frequency Stability} = \frac{(\text{Measurement Frequency}) - (\text{Designation frequency})}{(\text{Designation frequency})} \times 100$$

1.3.6.4.3 Check of TRX Unit transmitted modulation pulse and transmitted trigger waveform

(1) Used measuring instrument

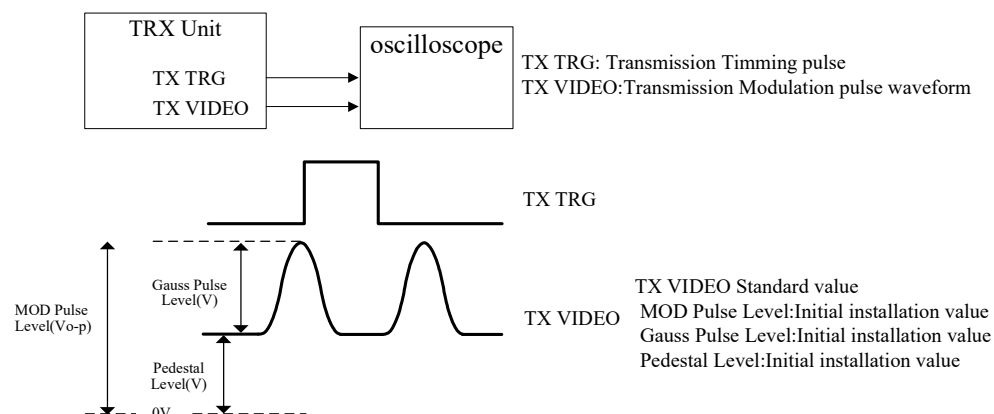
Oscilloscope

(2) Check method

(2-1) Connect an oscilloscope to the front check terminal [TX TRG] and [TX VIDEO].

(2-2) Turn on the transmitter by operating LCD Unit.

(2-3) Confirm that the transmitted pulse waveform is within the standard by using oscilloscope.



1.3.6.4.4 Check of TRX Unit pulse detection waveform

(1) Used measuring instrument

Oscilloscope

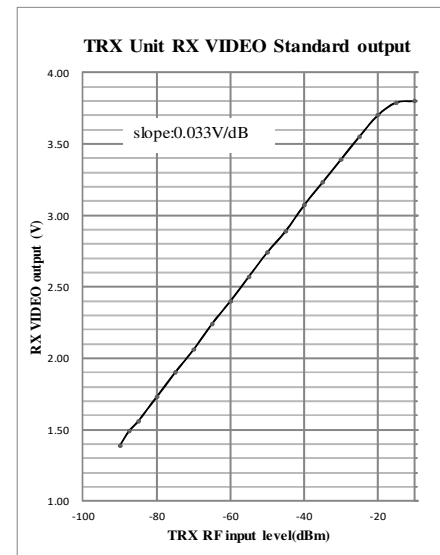
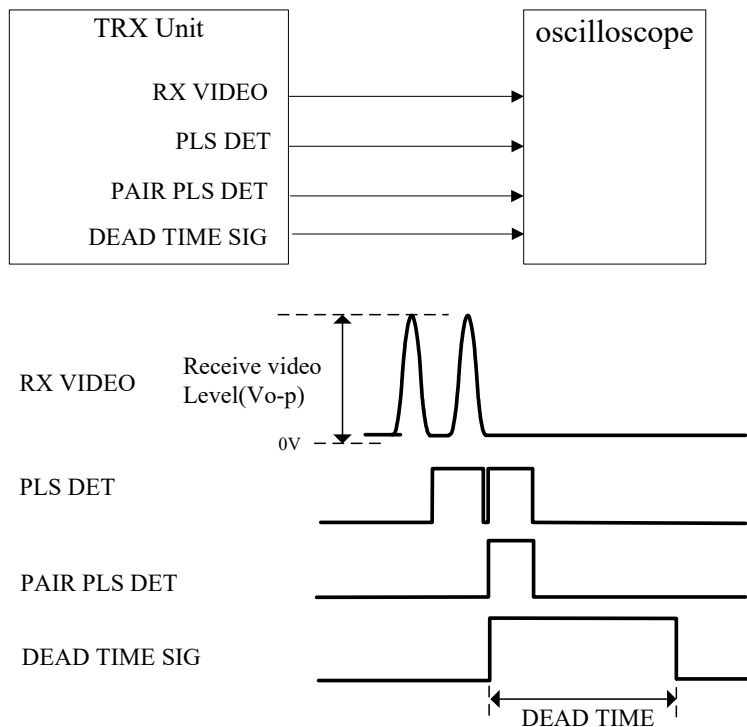
(2) Check method

(2-1) Connect an oscilloscope to the front check terminal [RX VIDEO] and [PLS DET] and [PAIR PLS DET] and [DEAD TIME SIG].

(2-2) LCD Unit setting is below.

- Main screen: [ALM BYP] and [STBY MNT] - ON.
- Monitor Setting: [TX ATT] is 30 to 40dB.

(2-3) Confirm that pair pulse detection signal is synchronized with pair pulse detection waveform by using an oscilloscope.



(Note)
DEAD TIME can be changed by adjusting value of LCD Transponder setting [DEAD TIME].

1.3.6.4.5 Check of TRX Unit ID pulse waveform

(1) Used measuring instrument

Oscilloscope

(2) Check method

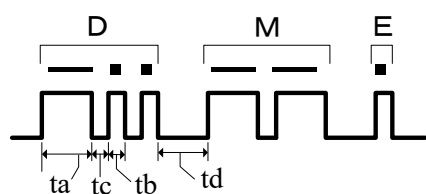
(2-1) Connect an oscilloscope to the front check terminal [ID].

(2-2) Turn on the transmitter by operating LCD Unit. .

(2-3) Confirm that the Morse code of the pulse pattern of ID is within the standard value and ID TONE is corresponding to the setting value.



For example



Standard value

ta: Dash time is 300-480ms (3 times the dot)

tb: Dot time is 100-160ms

tc: Interval time is 1 time the dot

td: Interval keying time is 1 time the dash

1.3.6.4.6 Check of TRX Unit transmit power

(1) Used measuring instrument

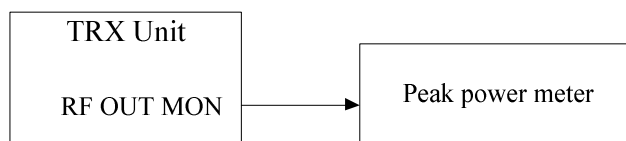
Peak power meter

(2) Check method

(2-1) Connect an Peak power meter to the front check terminal [RF OUT MON].

(2-1) Turn on the transmitter by operating LCD Unit.

(2-3) Confirm that TRX Unit transmit power by using a peak power meter.

Standard power Value :
Initial installation value.(Note)
RF OUT MON terminal is 40dB
coupling

1.3.6.4.7 Check of TRX Unit Receive sensitivity

(1) Used measuring instrument

Not required.

(2) Check method

(2-1) LCD Unit setting is below.

- Main screen: [ALM BYP] and [STBY MNT] - ON.
- TEST Parameter screen [OP MODE] is TRPN TEST.
- TEST Parameter screen [TEST TX RATE] is 1000.

(Note) This setting value is interrogator SG pulse rate value.

- TEST Parameter screen [TEST TX ATT] is 70dB provisionally.

(Note) This setting value is interrogator SG output level (Receiver input level -80dBm).

(2-2) LCD unit display view [Monitor]-[SENS VALUE]

(2-3) Set [SENS VALUE] to be less than 70% by adjusting the [TEST TX ATT].

(2-4) Confirm that the [TEST TX ATT] is more than 81dB.

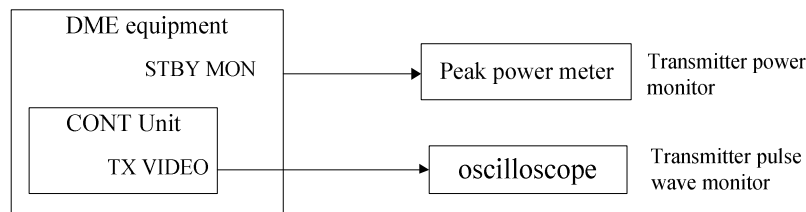
(Note)

If [TEST TX ATT] is 81dB, receive sensitivity value is -91dBm

1.3.6.5 TRX Unit adjustment method

1.3.6.5.1 TRX Unit transmitted pulse waveform

- (1) Open the [INSTALLATION SETTING] screen in the LCD Unit. Then, select [TRX] tab.
- (2) See the figure below, setting values of various parameters listed below, it is possible to adjust the transmission power and the transmission pulse characteristics.



(2-1) Turn on the transmitter by operating LCD Unit.

(2-2) [HP TX ALC REF] (transmitter power) is adjustable.

(Note) [HP TX ALC REF] typical value is 2600~2800



[HP TX ALC REF] Normally, the set value must not exceed 2800.

(2-3) [HP PDSTL LVL] and [PLS SHAPE] value is transmitter pulse width can adjustment.

(2-4) [HP PLS AMP ADJ] typically value is 50

(2-5) [2nd PLS AMP COMP] value is 1st/2nd pulse level difference of transmitter pulse can adjustment.

(2-6) [PLS SPACE COMP] value is transmitter pulse space can adjustment.

Replay pulse system delay timing adjustment

TX POWER ALC reference adjustment

Pedestal modulation level Adjustment

Gauss modulation level Adjustment

1st/2nd Puls modulation level diff Adjustment

Gauss modulation pulse waveform select

TX pulse space adjustment

(Note1)
Transmitted pulse width can be adjusted at the HP PDSTL LVL and PLS SHAPE.

(Note2)
HP PLS AMP ADJUST setting typical value is [50]

Parameter	Value		Setup Value		Unit
	No 1	No 2	No 1	No 2	
SYS DLY COMP(LOOP)	+1.80	+3.00			μs
SYS DLY COMP(ANT)	-0.80	-0.80			μs
HP TX ALC REF	2570	2850			
HP PDSTL LVL	1000	740			
HP PLS AMP ADJUST	50	50			
2ND PLS AMP COMP	0	0			
REFL PWR ADJUST(1)	+0.006522	+0.006522			dBm/bit
REFL PWR ADJUST(2)	0.00	0.00			dB
PLS SHAPE	0	0			
PLS DET LVL(1)	0x00001000	0x00001000			
PLS DET LVL(2) - U	0x00040000	0x00040000			
PLS DET LVL(2) - L	0x06000000	0x08000000			
TX RATE CAPACITY	2700	2700			
PLS SPACE COMP	0.00	0.00			

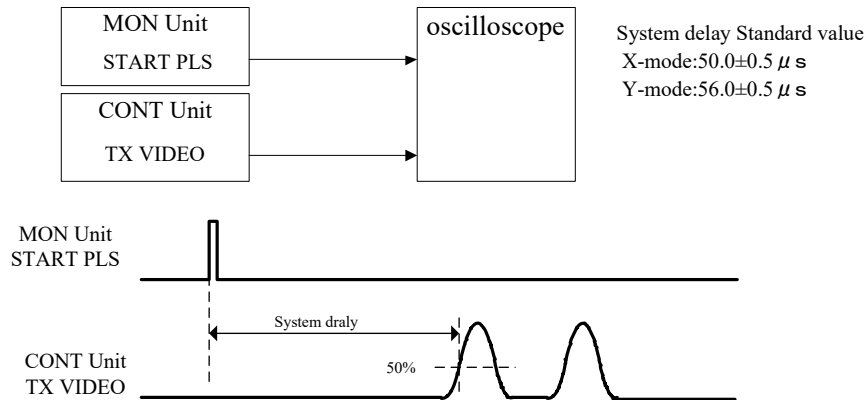
Number: [1] [2] [3] [4] [5] [-] [BS] [↑] [←] [6] [7] [8] [9] [0] [+] [.] [↓] [→]

Limit: [-10.00 ~ +10.00] [Load] [Save] [SET] [All Clear]

Main Screen [Monitor] [Transponder Setting] [Monitor Setting] [TEST Parameters] [Installation Setting] [LogOff]

1.3.6.5.2 TRX Unit system delay

- (1) Open the [INSTALLATION SETTING] screen in the LCD Unit. Then, select [TRX] tab.
- (2) See the figure below, Setting values of various parameters listed below, it is possible to adjust the transmission power and the transmission pulse characteristics.



- (2-1) Turn on the transmitter by operating LCD Unit. .
- (2-2) [SYS DELY CMP (LOOP)] value can adjust the system delay when turn on the STBY MNT side transponder,
- (2-3) [SYS DELY CMP (ANT)] value can adjust the system delay when turn on the operational side transponder,

1.3.7 MON Unit

1.3.7.1 MON Unit test point table

Table 1.3.7.1-1 MON Unit test point

Component	Test point name	Description
MON Unit	TX PLS	Transmission pulse waveform monitor output
	START PLS	Pair pulse transmission timing output
	RPY PLS DET	Receipt pair pulse detection signal output
	RF OUT MON	Monitor generation interrogator signal monitor output

1.3.7.2 MON Unit electric check item table

Table 1.3.7.2-1 MON Unit electric check item (1/2)

Number/Item/Category	Overview of check	Setting criteria	Check method	Adjustment method
1.3.7.2.1 Check of display status <A>	Check display status of LED [PRI ALM] [SEC ALM] [SLF ALM] and [SLF CHK].	They should be turned off. It should blink at one second interval.	See 1.3.7.3.1	-
1.3.7.2.2 Observation of transmit pulse waveform <C>	Measure it by connecting an oscilloscope to the front check terminal [STRAT PLS] [TX PLS] and [RF OUT MON].	Below Pulse characteristic 1. Pulse width 2. Pulse rise time 3. Pulse decay time 4. Pulse space time Should be within standard.	See 1.3.7.3.2	-
1.3.7.2.3 Check of interrogation pulse transmission level <C>	Measure it by connecting a spectrum analyzer or peak power meter to the front check terminal [RF OUT MON].	Interrogation pulse standard level +5dBm	See 1.3.7.3.3	-
1.3.7.2.4 Check of response pulse detection and system delay function. 	Measure it by connecting an oscilloscope to the front check terminal [START PLS] [RPY PLS DET] and CONT Unit [TX VIDEO].	Response pulse detection signal and system delay should be output. (Pair pulse should be detected.)	See 1.3.7.3.4	See 1.3.6.4.2 See 1.3.7.4

1.3.7.3 MON Unit check method

1.3.7.3.1 Checking MON Unit display status

(1) Used measuring instrument

Not required

(2) Check method

- (2-1) Check display status of [PRI ALM] LED.
- (2-2) Check display status of [SEC ALM] LED.
- (2-3) Check display status of [SLF ALM] LED.
- (2-4) Check display status of [SLF CHK] LED.

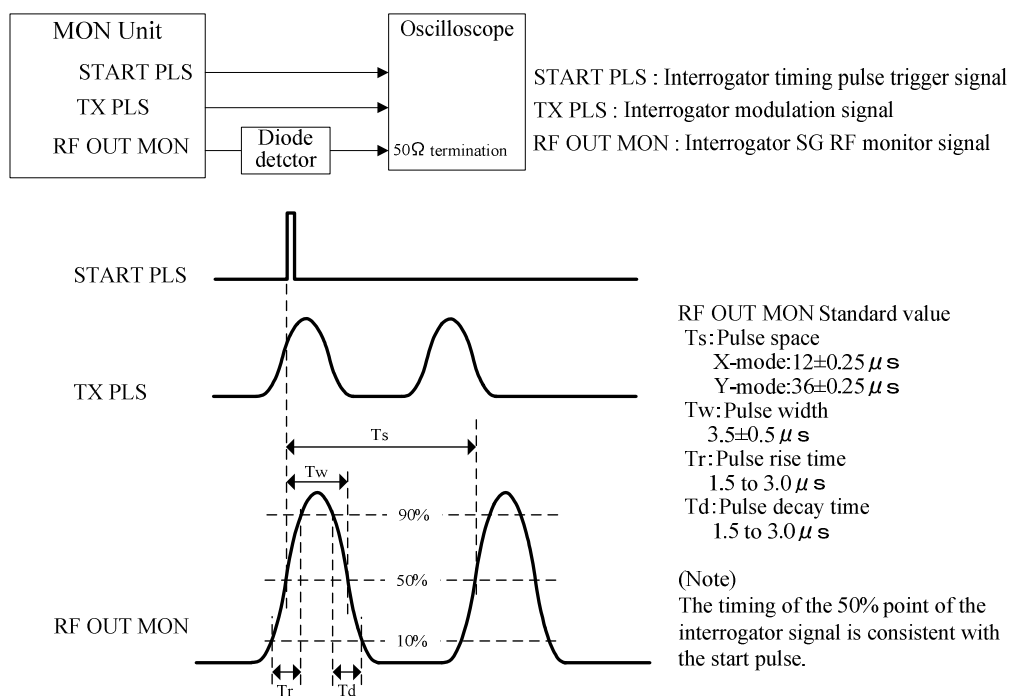
1.3.7.3.2 MON Unit transmit pulse waveform

(1) Used measuring instrument

Oscilloscope and Diode detector

(2) Check method

- (2-1) Connect an oscilloscope to the front check terminal [START PLS], [TX PLS] and [RF OUT MON].
- (2-2) LCD Unit setting is below.
 - Main screen: [ALM BYP] and [STBY MNT] - ON.
 - Monitor Setting [TX ATT] is 0dB.
- (2-3) Confirm that pair pulse detection signal is synchronized with pair pulse detection waveform by using an oscilloscope.



1.3.7.3.3 MON Unit interrogation pulse transmission level

(1) Used measuring instrument

Spectrum analyzer or Peak power meter

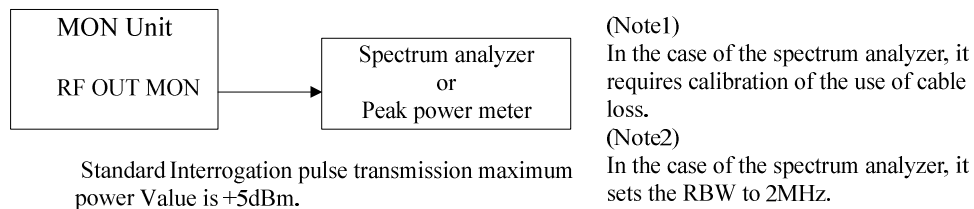
(2) Check method

(2-1) Connect a Spectrum analyzer Or Peak power meter to the front check terminal [RF OUT MON].

(2-2) LCD Unit setting is below.

- Main screen: [ALM BYP] and [STBY MNT] - ON.
- Monitor Setting [TX ATT] is 0dB.

(2-3) Interrogation pulse transmission maximum power measure by using a Spectrum analyzer or Peak power meter.



1.3.7.3.4 Confirmation of MON Unit Reply pulse detection function and system delay

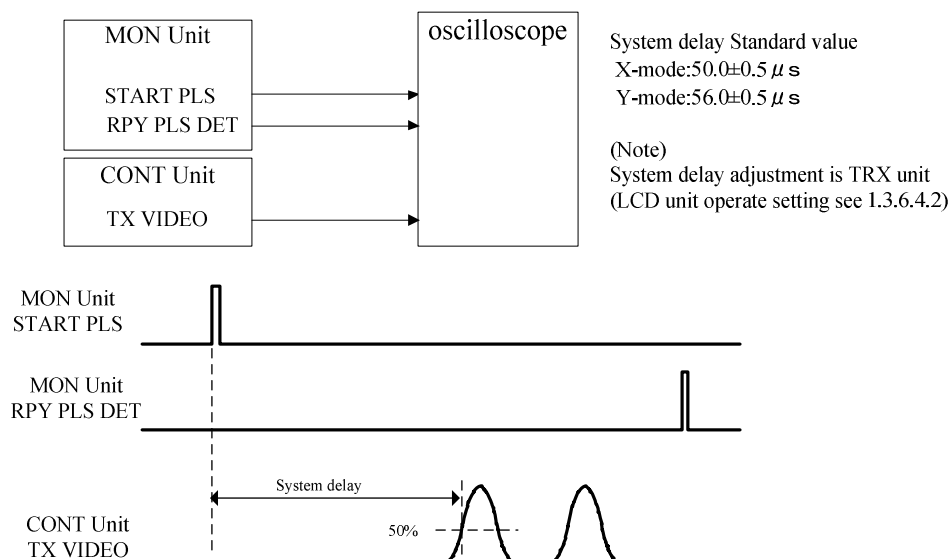
(1) Used measuring instrument

Oscilloscope

(2) Check method

(2-1) Connect an Oscilloscope to the front check terminal [START PLS], [RPY PLS DET] and CONT Unit [TX VIDEO].

(2-2) Confirm that the system delay is within the standard value by using an oscilloscope.



1.3.7.4 MON Unit adjustment method

The method of adjusting the measurement value by the monitor unit internal processing, described below.
This adjustment is performed when the difference between the measured value and monitoring unit using the measuring instrument is increased.

- (1) As shown in the figure below, you can adjust the [Monitor] screen measurement value and [Installation Setting] MON each adjust parameter of the tab. (see Figure 1.3.7.4)

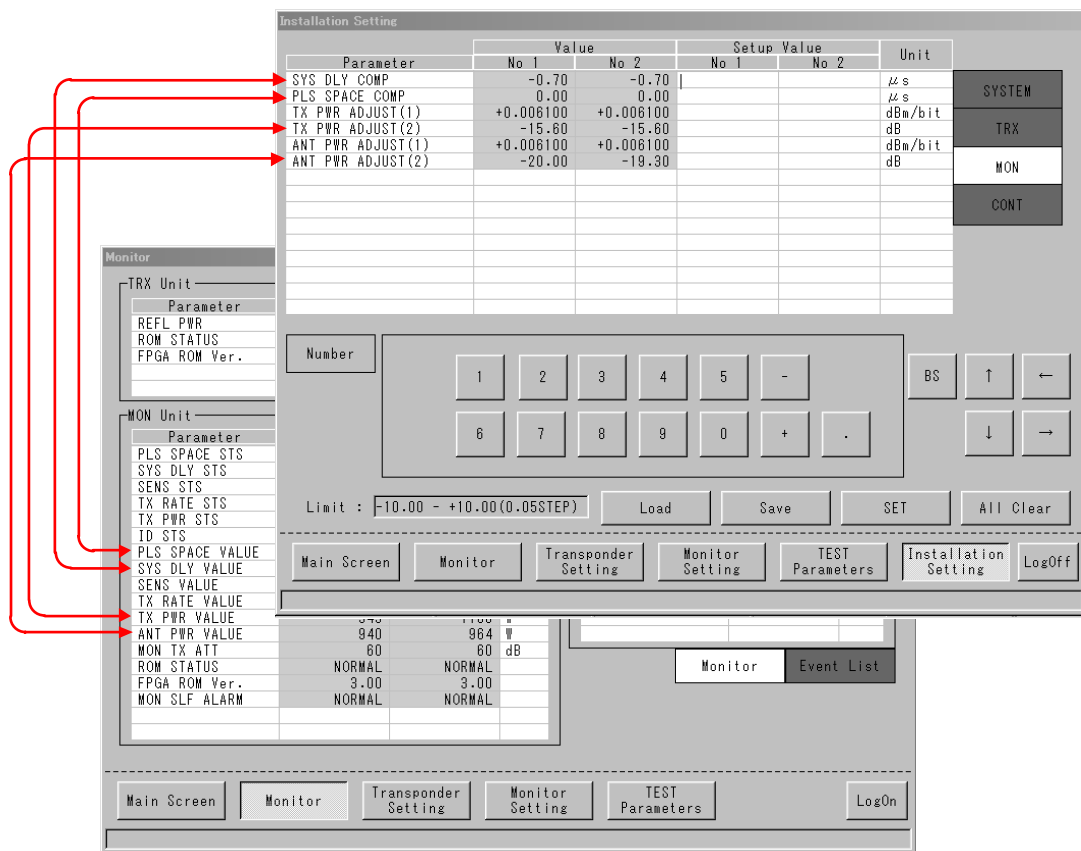


Figure 1.3.7.4 Monitor and Initial Setting screen

1.3.8 HPA Unit

1.3.8.1 HPA Unit Electric check item table

Table 1.3.8.1-1 HPA Unit electric check item

Number/Item/Category	Overview of check	Setting criteria	Check method	Adjustment method
1.3.8.1.1 Check of display status <A>	Check display status of LED [ALM].	It should be turned off.	See 1.3.8.2.1	-
1.3.8.1.2 Check of transmission level 	Measure it a peak power meter to the front check terminal [STBY OUT].	Transmission level standard +20dBm	See 1.3.8.2.2	See 1.3.8.3.1

1.3.8.2 HPA Unit check method

1.3.8.2.1 Checking HPA Unit display status

(1) Used measuring instrument

Not required

(2) Check method

(2-1) Check display status of [ALM] LED.

1.3.8.2.2 HPA Unit transmission level

(1) Used measuring instrument

Peak power meter

(2) Check method

(2-1) Connect a peak power meter to the front check terminal [STBY OUT].

(2-2) Confirm that the transmission level is within standard by using a peak power meter.

1.3.8.3 HPA Unit adjustment method

1.3.8.3.1 HPA Unit transmission level

(1) Open the [TRANSPONDER SETTING] screen in the LCD Unit. Then, select the [TRX] tab.

(2) Change setting in the Setup Value column of the Parameter [TX POWER ADJUST]. Adjust it so that the transmission level is within the standard.

1.3.9 RCMS

1.3.9.1 RCMS electric check item table

Table 1.3.9.1-1 RCMS electric check item

Number/Item/Category	Overview of check	Setting criteria	Check method	Adjustment method
1.3.9.1.1 Check of display status <S>	Confirm that the RCMS displays characters and colors.	Characters and colors should be displayed. They should correspond to the current operation status. No alarm should be displayed.	See 1.3.9.2.1	-

1.3.9.2 RCMS check method

1.3.9.2.1 Checking RCMS display status

(1) Used measuring instrument

Not required

(2) Check method

(2-1) Confirm that the RCMS displays characters and colors.

(2-2) Confirm that displays correspond to the current operating status of the device.

(2-3) Confirm that no alarm is displayed.

1.3.10 NAV Panel (Option)

1.3.10.1 NAV Panel electric check item table

Table 1.3.9.1-1 NAV Panel electric check item table

No./Item/Category	Outline of check	Setting criteria	Check method	Adjustment method
1.3.10.1.1 Check of display status <S>	The [TEST] switch of front panel is pressed and check the display state of LED and the Buzzer sound.	LEDs should be turned on. Buzzer should sound.	See 1.3.10.2.1	-

1.3.10.2 NAV Panel checkup method

1.3.10.2.1 Check of NAV Panel display and buzzer state

(1) Used measuring equipment

None

(2) Check method

(2-1) The [TEST] switch of front panel is pressed and check the display state of the LEDs (Except BUZ OFF indicator) and the Buzzer sound.

1.3.11 Cable

1.3.11.1 Connection cable electric check item table

Table 1.3.11.1-1 Connection cable electric check item table

Number/Item/Category	Overview of check	Setting criteria	Check method	Adjustment method
1.3.11.1.1 Check of connection cable <D>	Confirm that there is no loose of cables connected to each device, rust and discoloration of connectors. Specially, check loose and breakage of coaxial cables.	There should be no abnormality.	See 1.3.11.2.1	-

1.3.11.2 Connection cable check method

1.3.11.2.1 Check of connection cable

(1) Used measuring instrument

Not required

(2) Check method

(2-1) Confirm that there is no loose of cables connected to each device, rust and discoloration of connectors.

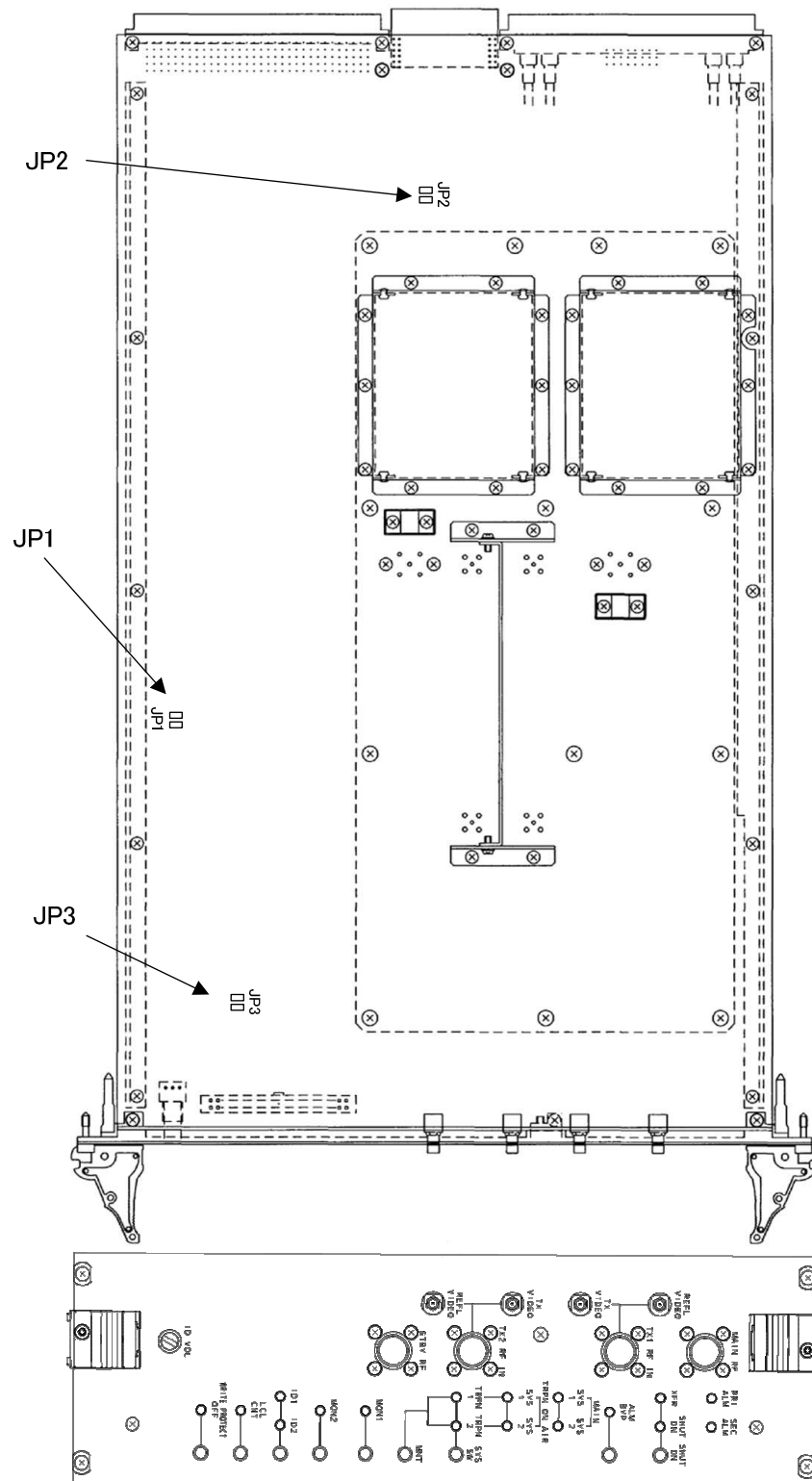
Especially, check loose and breakage of coaxial cables.

1.4 Default of each unit

1.4.1 Default of CONT Unit

Default of CONT Unit switches is shown below:

Number	Circuit symbol	Function	Setting
1	JP1	FPGA configuration mode	JP1: 1-2 OPEN
2	JP2	Test communication port	JP2: 1-2 OPEN
3	JP3	Board reset	JP3: 1-2 OPEN

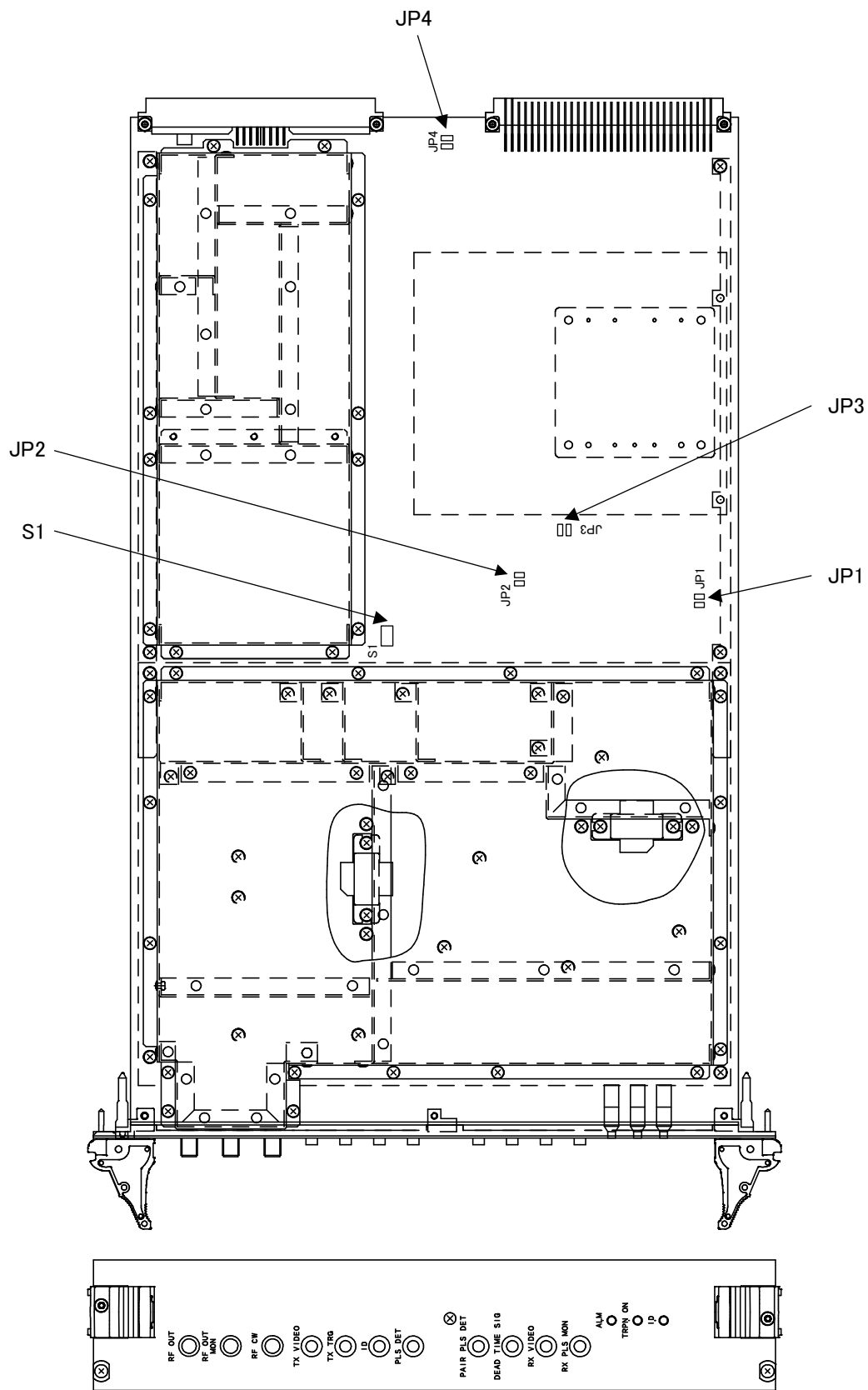


CONT Unit

1.4.2 Default of TRX Unit

Default of TRX Unit switches is shown below:

Number	Circuit symbol	Function	Setting
1	S1	Test setting	S1-1: OFF S1-2: OFF S1-3: OFF S1-4: OFF S1-5: OFF S1-6: OFF S1-7: OFF S1-8: ON
2	JP1	Board reset	JP1: 1-2 OPEN
3	JP2	FPGA configuration mode	JP2: 1-2 OPEN
4	JP3	J-TAG chain setting	JP3: 1-2 OPEN
5	JP4	Test communication port	JP4: 1-2 OPEN

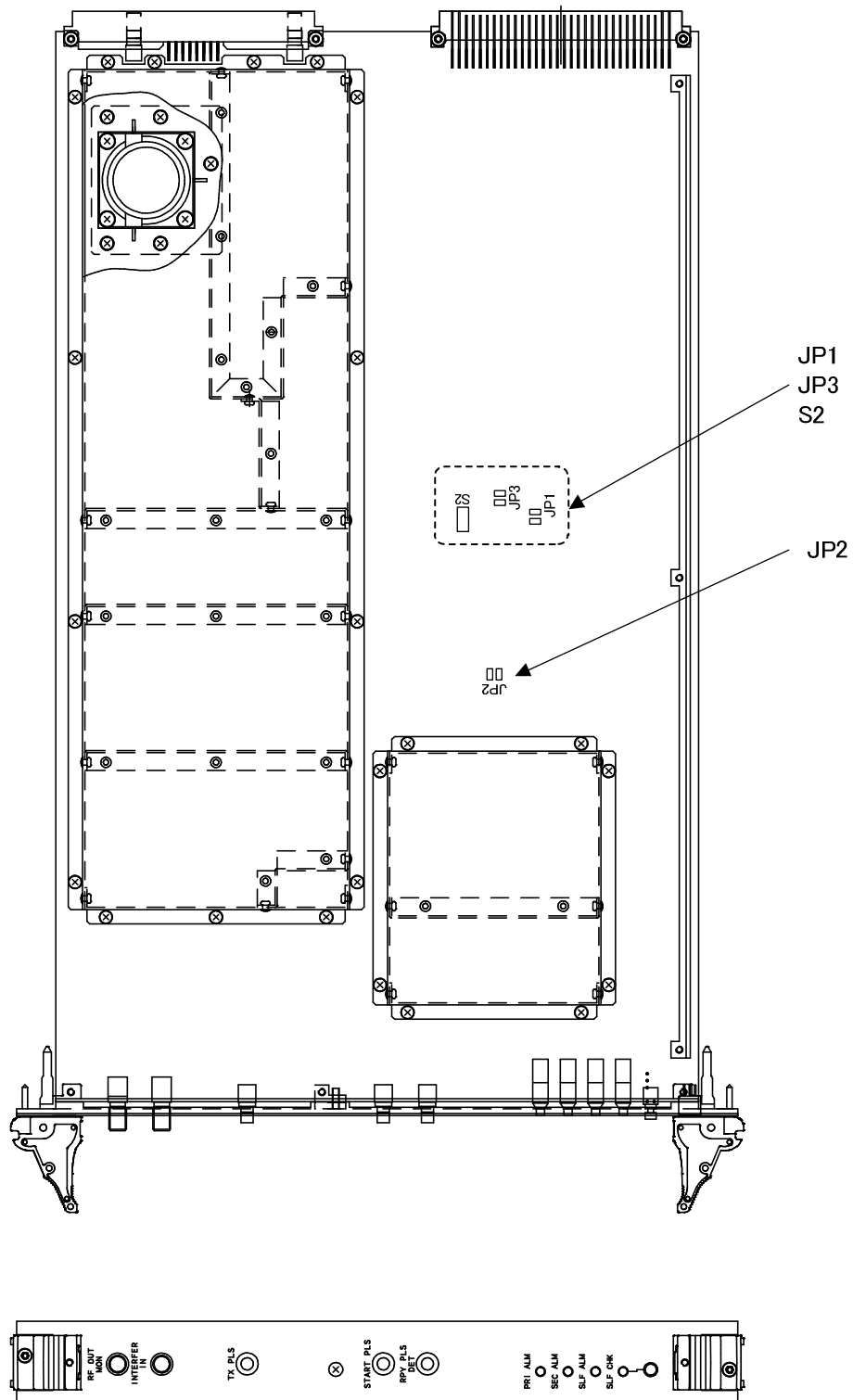


TRX Unit

1.4.3 Default of MON Unit

Default of MON Unit switches is shown below:

Number	Circuit symbol	Function	Setting
1	S2	Test setting	S2-1: ON S2-2: ON S2-3: ON S2-4: ON S2-5: ON S2-6: ON S2-7: OFF S2-8: OFF
2	JP1	Board reset	JP1: 1-2 OPEN
3	JP2	FPGA configuration mode	JP2: 1-2 OPEN
4	JP3	Test communication port	JP3: 1-2 OPEN

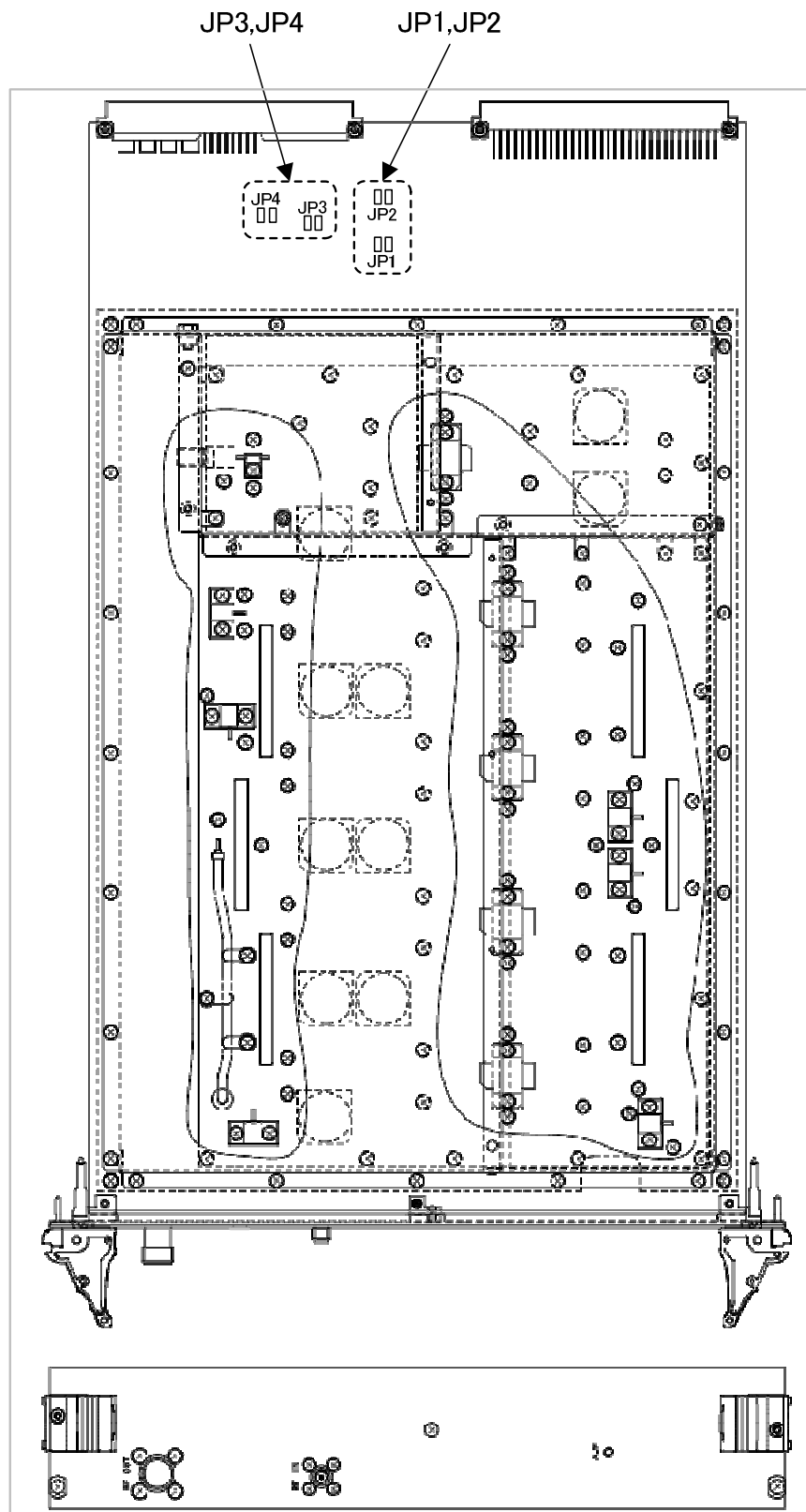


MON Unit

1.4.4 Default of HPA Unit

Default of HPA Unit switches is shown below:

Number	Circuit symbol	Function	Setting
1	JP1	ALARM TEST1	JP1: 1-2 OPEN
2	JP2	ALARM TEST2	JP2: 1-2 OPEN
3	JP3	ALARM TEST3	JP3: 1-2 OPEN
4	JP4	ALARM TEST4	JP4: 1-2 OPEN



HPA Unit

1.5 Software

(1) Software installation environment

Item	Specifications
OS	Microsoft Windows 7,8, or subsequent ones (English Version)
Processor	Hardware specification needed by the OS.
Cache memory	
Chipset	
Memory	
Display function	
Interface	• LAN (100Base-TX/10Base-T(RJ45)) x 1 or more • Serial (RS-232C) x 1 or more

(2) About CD-ROM of software

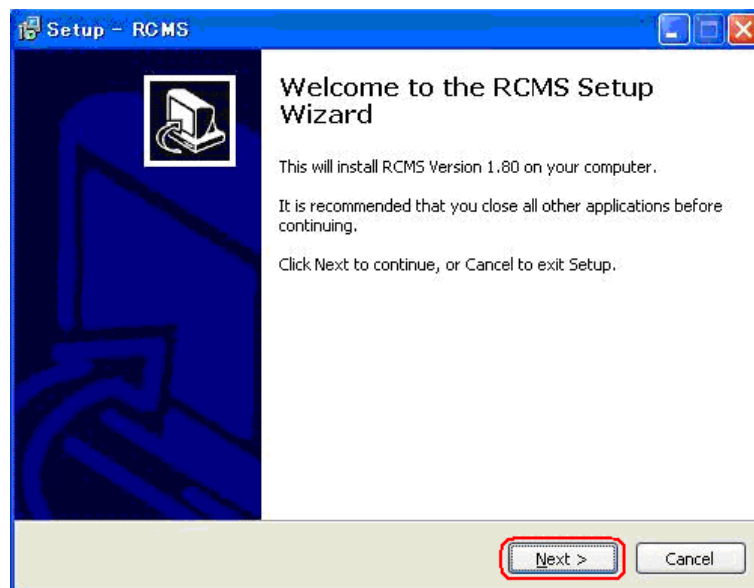
- a. Correspondence OS of software should check the display of CD-ROM.
- b. If Check "Read me" file is in the CD-ROM, please and follow the instructions before installation of software.

1.5.1 RCMS software

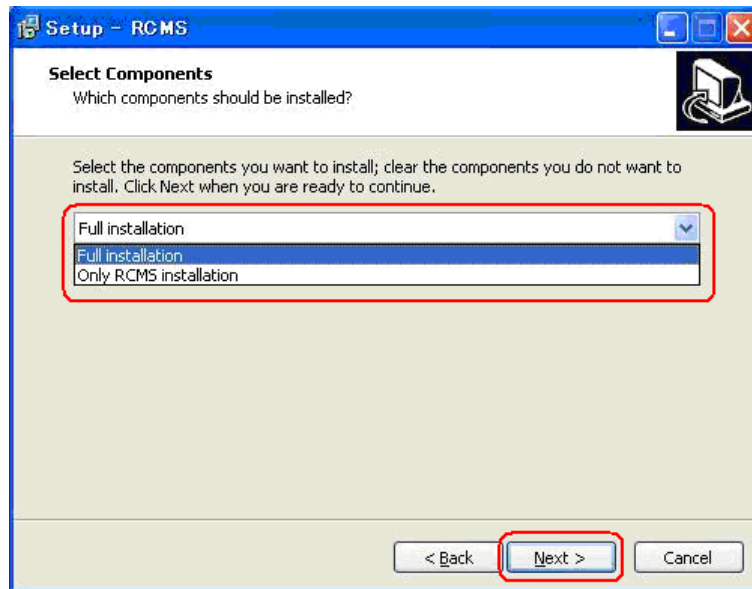
1.5.1.1 Installing RCMS software

Install the software on the RCMS (general-purpose PC) using the CD-ROM.

- (1) Install the CD-ROM on the CD-ROM drive. Open the folder of RCMS for DME (not for DVOR).Execute the file"RCMS_Setup.exe" (It is not be considered if the version name is added in exe file).When the following screen is displayed, press the "NEXT" button.

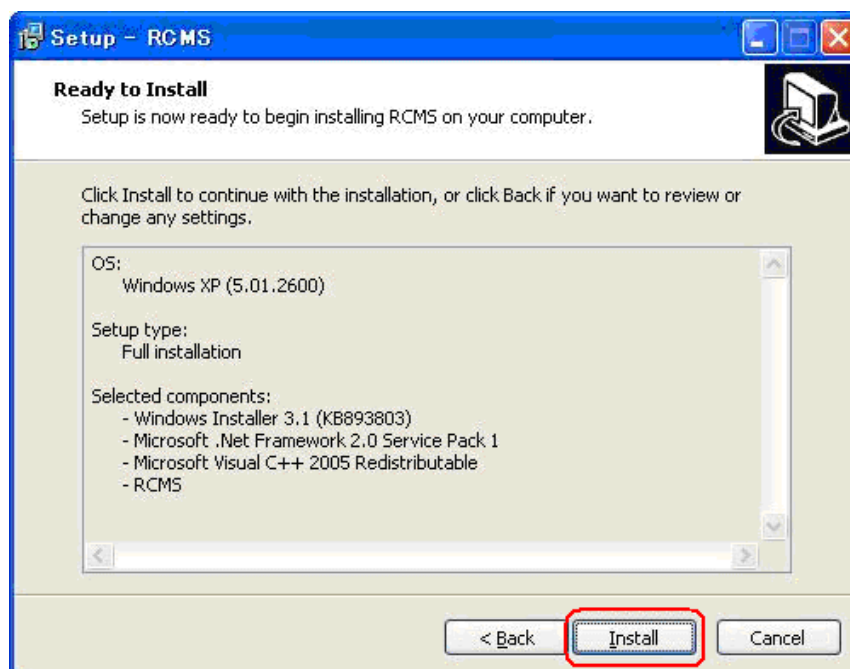


- (2) Select from a list of components to install and press the [NEXT] button. [Full installation] is to install all components. [Only RCMS installation] is to upgrade the existing RCMS. When [Full installation] is selected, follow 1.5.1.1.1 Full installation. When [Only RCMS installation] is selected, follow 1.5.1.1.2 Installation only RCMS.



1.5.1.1.1 Full installation

- (1) In this screen, the OS information of the PC, Setup type and selected components to install are displayed.
Press the “Install” button and start the installation.



① OS information

The version and OS type of PC to install.

※ If the type of the OS is unknown, only version information is displayed

② component information

Displays the components to install.

Components are installed from the top to down components that are displayed.

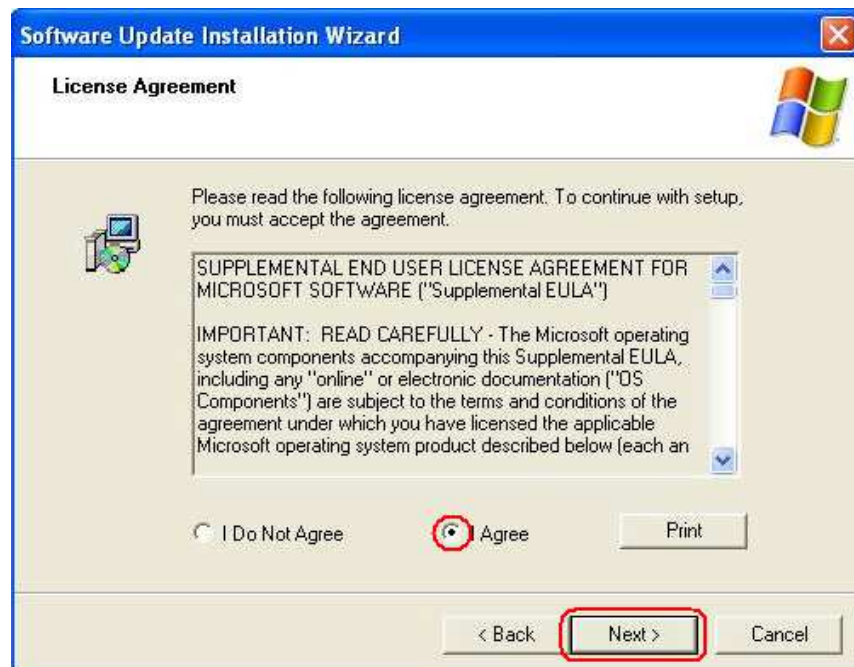
※ components to be installed is different by the OS. (See table below)

Component / OS	Windows XP	Windows Vista	Windows 7	Windows 8	Other
Windows Installer 3.1 (KB893803)	●	-	-	-	●
Microsoft .Net Framework2.0 Service Pack 1	●	-	-	-	●
Microsoft Visual C++ 2005 Redistributable	●	●	●	●	●
RCMS	●	●	●	●	●

- (2) 'Windows Installer 3.1 (KB893803)' installation is used for except Windows Vista, Windows7, and Windows8. Press the "Next>" button.



Put a check in the "I Agree", and then press the "Next" button.



Press the "Finish" button.



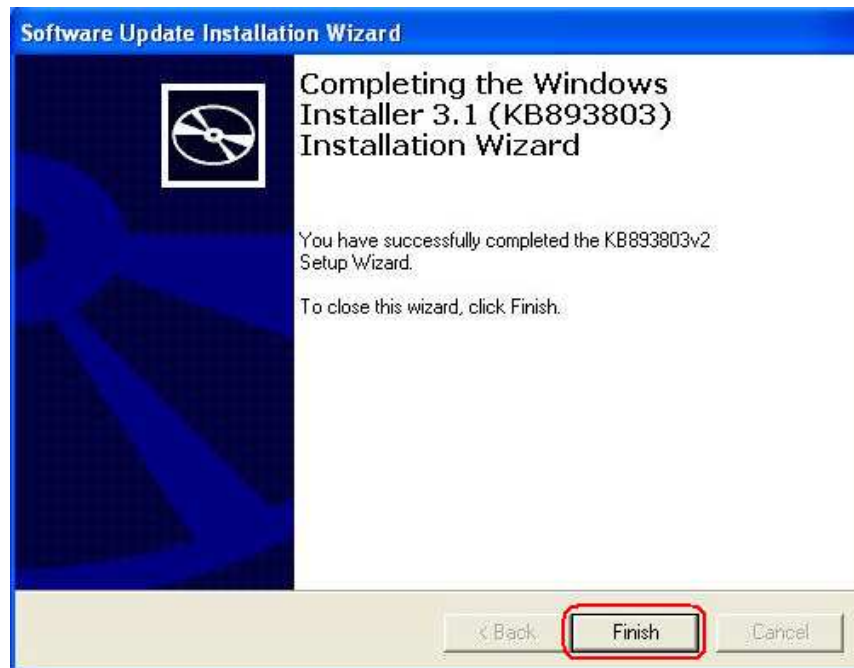
Check "Yes, restart the computer now" and the "Finish" button, the computer will be restarted automatically.



After the restart, and then start the installation again.

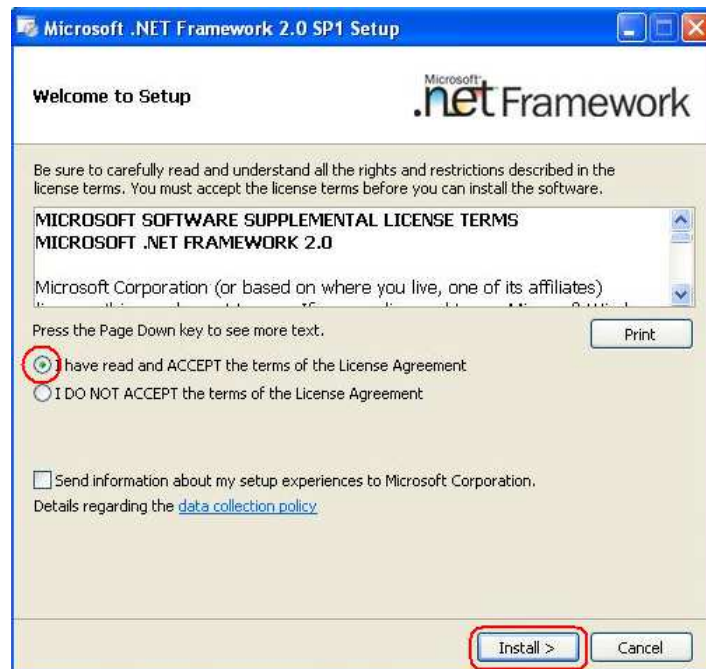
When the user presses the "Finish" button in the following screen, installation of Installer 3.1 is complete.

※ This screen is displayed after the restart.

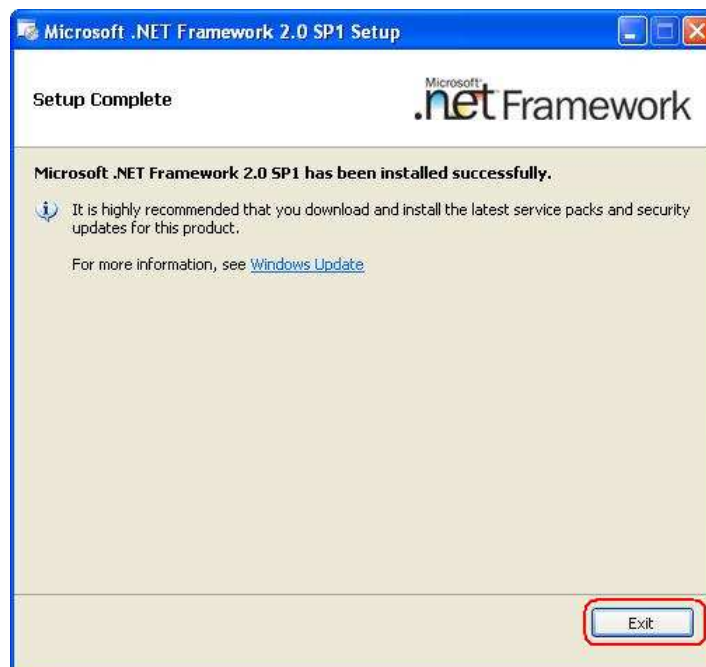


- (2) 'Microsoft .NET Framework 2.0 SP1' installation is used for except Windows Vista, Windows7, and Windows8.

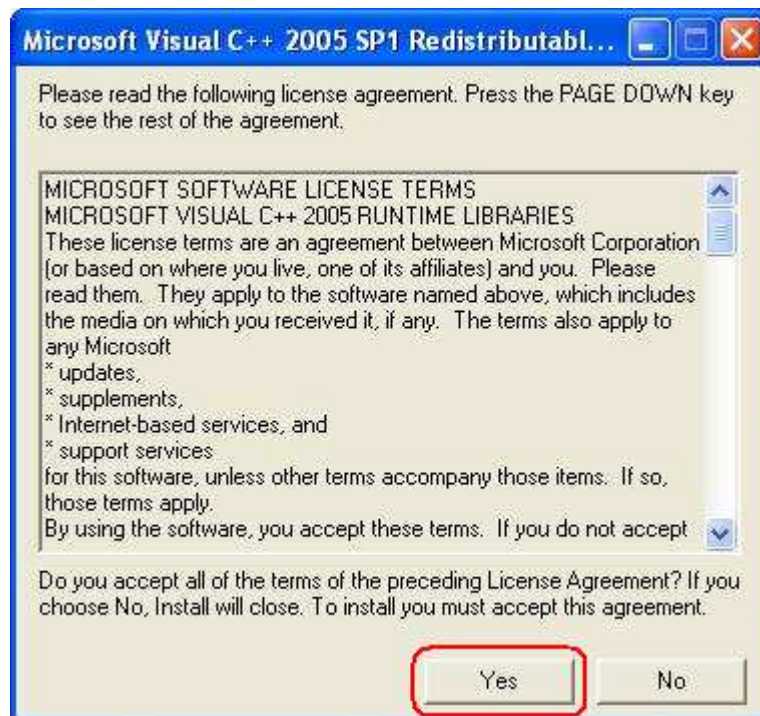
Put a check in the "I have read and ACCEPT the terms of the License Agreement", and then press "Install>" button.



After the install, press the "Exit" button, installation of 2.0 SP1. Net Framework will be completed.



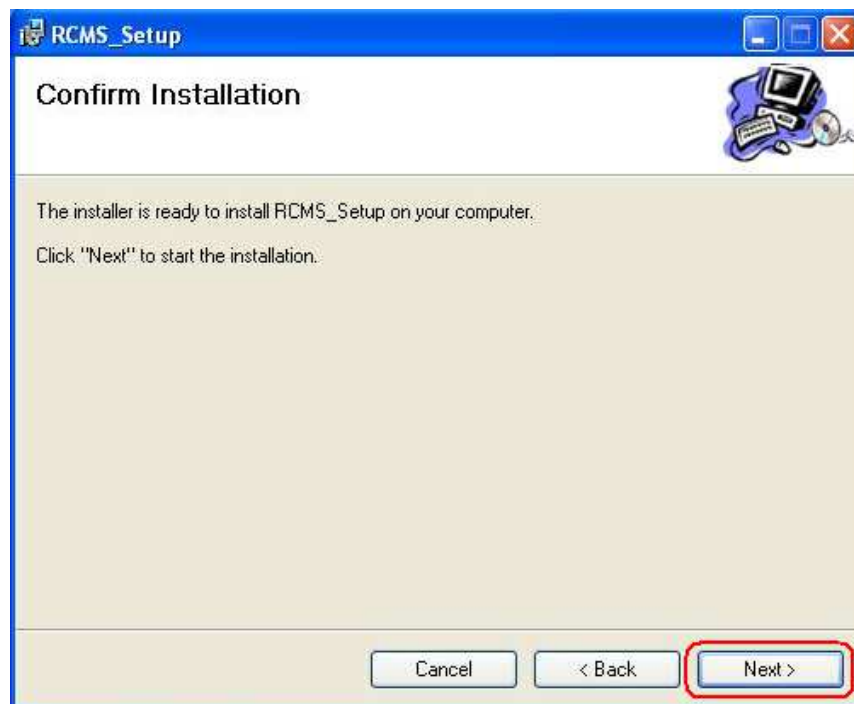
(4)'Microsoft Visual C++ 2005 Redistributable' is used for All kind of OS.
Presses the "Yes" button, and the installation of 'Visual C++ 2005 Redistributable' is started.



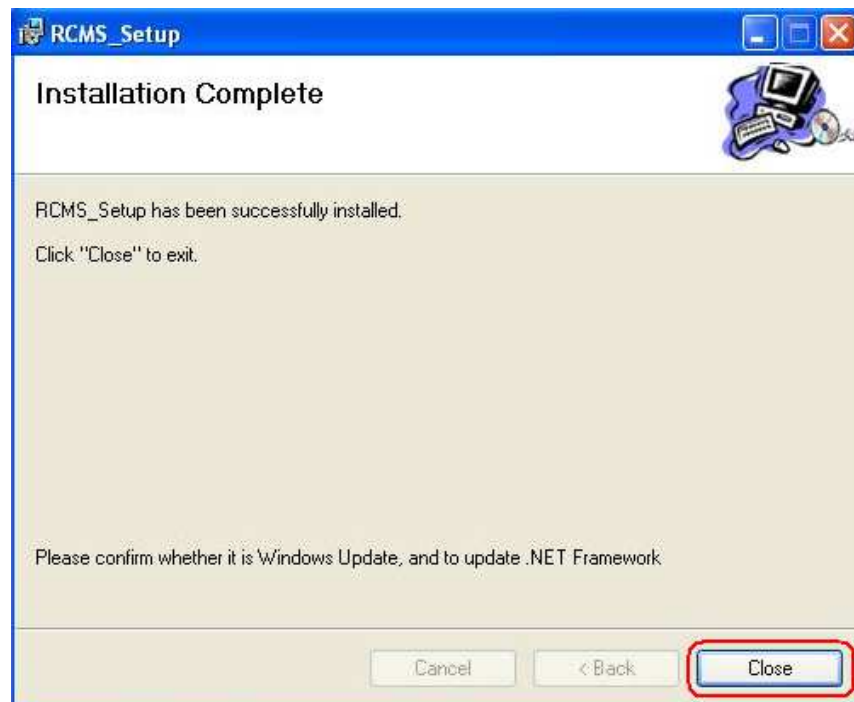
(5) When 'RCMS' Setup is started. Press the "Next>" button.



Press the "Next>" button.



Installation of RCMS has been completed by pressing the "Close" button, the RCMS shortcut is created on the desktop.

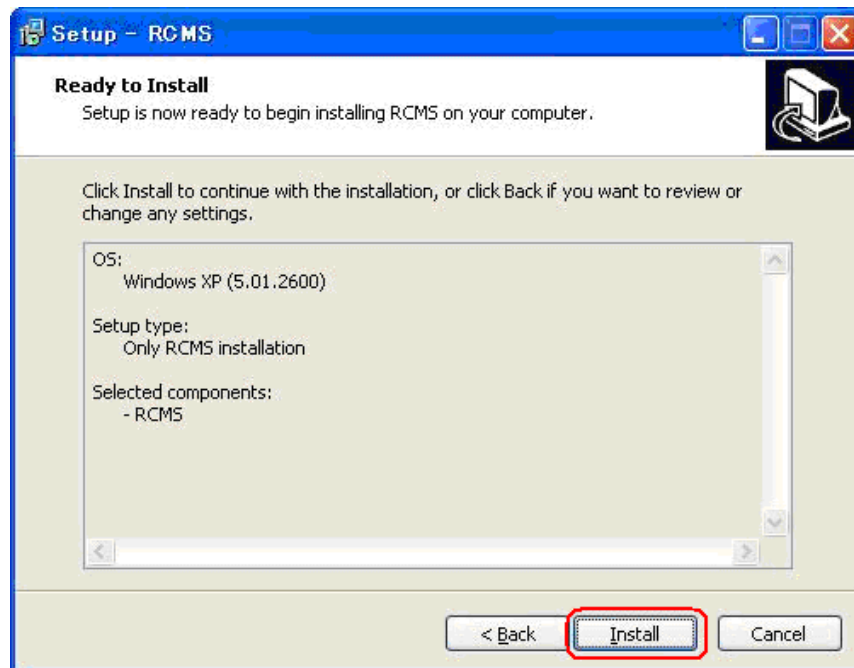


1.5.1.1.2 Installation only RCMS.

In this screen, OS information of the PC, Setup type, and selected components to install.

Press the "Install" button to start the installation.

And follow from 1.5.1.1.1(5).



1. 5. 1. 1. 3 Installation is complete

(1) Press the "Finish" button and all installations will be completed.



(2) Double-click the shortcut of RCMS, which is created on the desktop, RCMS will be started.

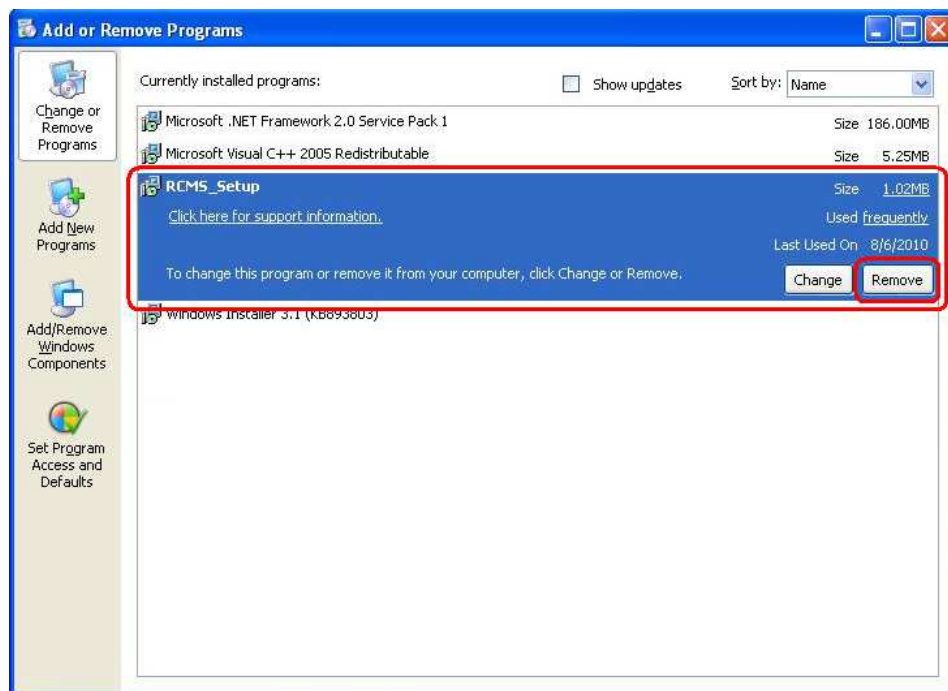


1. 5. 1. 2 Uninstalling RCMS software

Uninstall the software using the CD-ROM on the RCMS (general-purpose PC).

Or it's uninstalled by the following way.

- (1) From the PC control panel, implement deletion of RCMS_Setup. The method of deleting software is a Windows basic function.



- (2) When the following file removal confirmation message appears, select [Yes].



1. 5. 1. 3 RCMS environment setting

When connecting the RCMS to the LAN1 (REMOTE) or LAN2 (LOCAL) side, 2 step of setting is required before starting the RCMS software.

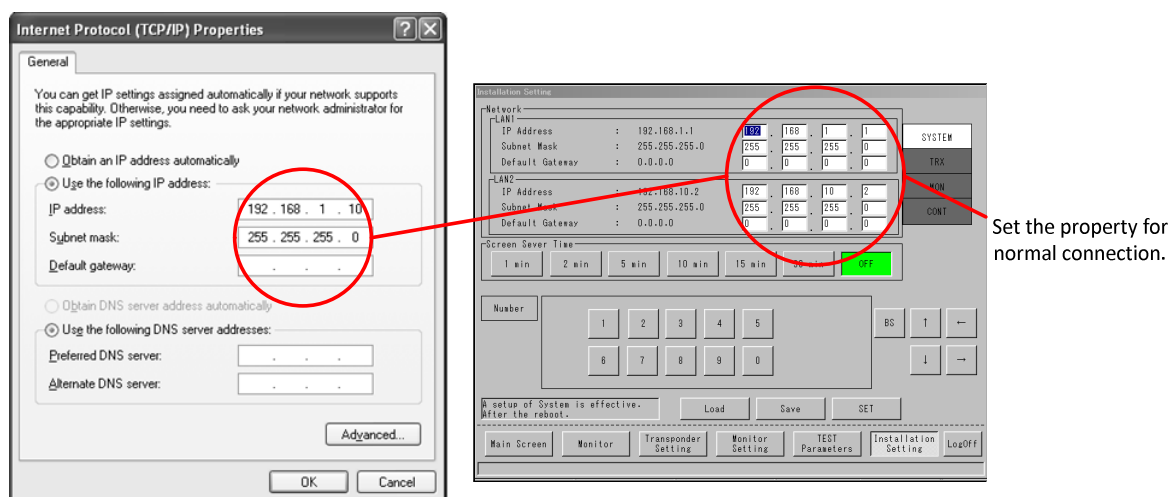
- set the network address according to LOCAL Equipment
- set the port number in system.ini file according to the connection of LAN1 or LAN2

1. 5. 1. 3. 1 Network setting of RCMS

- (1) Click “Start” and “Control Panel” on the Windows screen.
- (2) Double-click the "Network and Internet Connections" on the Control Panel.
- (3) Double-click the Network Connections.
- (4) Double-click the Local Area Connection.
- (5) Open the Advanced tab and click the Windows Firewall Settings.
- (6) Open the General tab, select Off (not recommended), and then click OK.
- (7) Click OK on the Local Area Connection Properties screen.
- (8) Open the General tab on the Local Area Connection Properties screen. Select the Internet Protocol (TCP/IP), and then click “Properties”.

- (9) Select the “Use the following IP Address” on the Internet Protocol (TCP/IP) Properties screen to set the IP address and Subnet mask. Click OK (see the display screen below).

IP address, Subnet mask, and Default gateway should be set properly by referring the setting of LCD Unit.



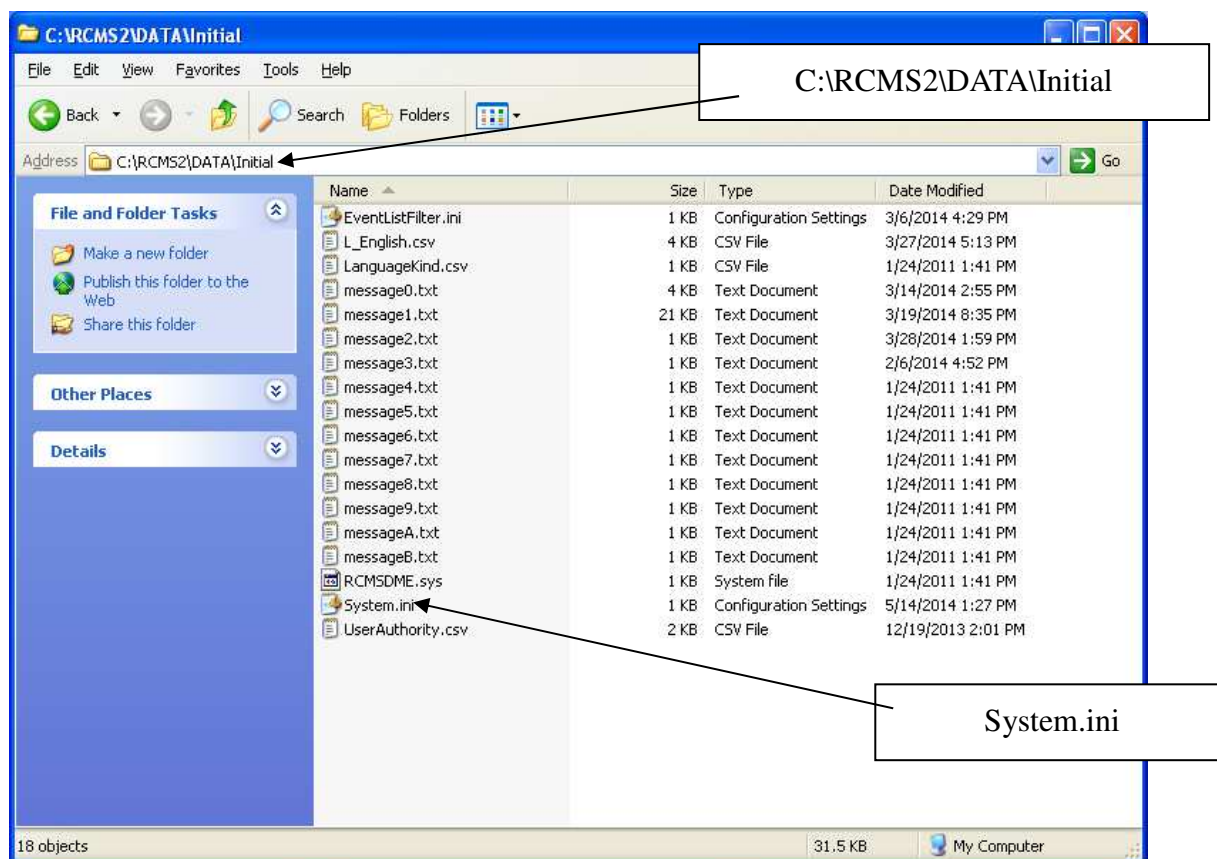
- IP Address and Subnet mask used in this picture are samples.

- (10) Click OK to exit the screen.

1. 5. 1. 3. 2 Port number setting of RCMS

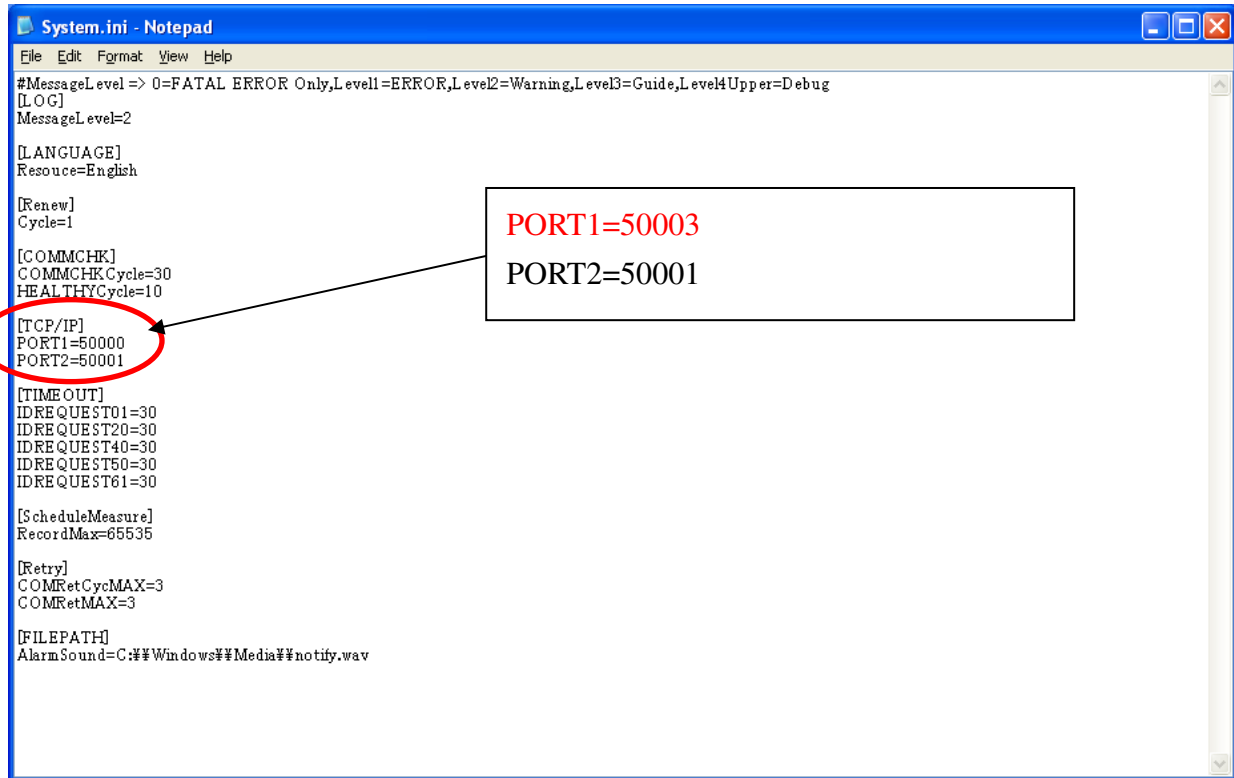
(1) Select the folder where system.ini file of RCMS is in.

Select “(Installed folder)¥DATA¥Initial”.



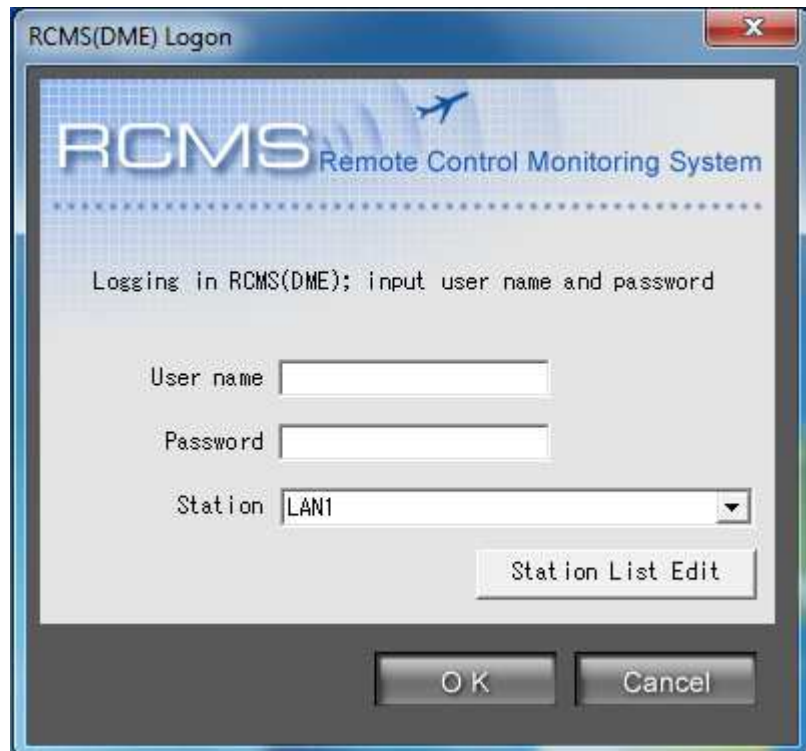
In this case, RCMS is installed at C:\RCMS2 folder.

- (2) Select the “System.ini” file and check Port numbers at [TCP/IP] item.



1. 5. 1. 4 Start of RCMS

- (1) Connect the RCMS and click the RCMS icon to start the RCMS software.
- (2) When a connection with Local Equipment (DME) is requested, Log on screen is displayed. Station List screen is opened when “Station List Edit” is selected (see (3)) and create the station to control or connect. And Enter Username (MASTER) and Password (MASTER).



- (3) Station List is set referring to the paragraph on the Station List screen of Operation Guidance. The connection destination is selected from Station name after Station List is set.

Station name	State	Port	Connect method
dialup	Close	COM6	044-548-5048
Direct	Open	COM6	192.168.1.1
LAN1	Close	LAN	192.168.1.1

Edit

Station name: Direct

☐ Dialup
 ☒ Direct
 ☐ TCP/IP

Port: COM6
 Telephone number:

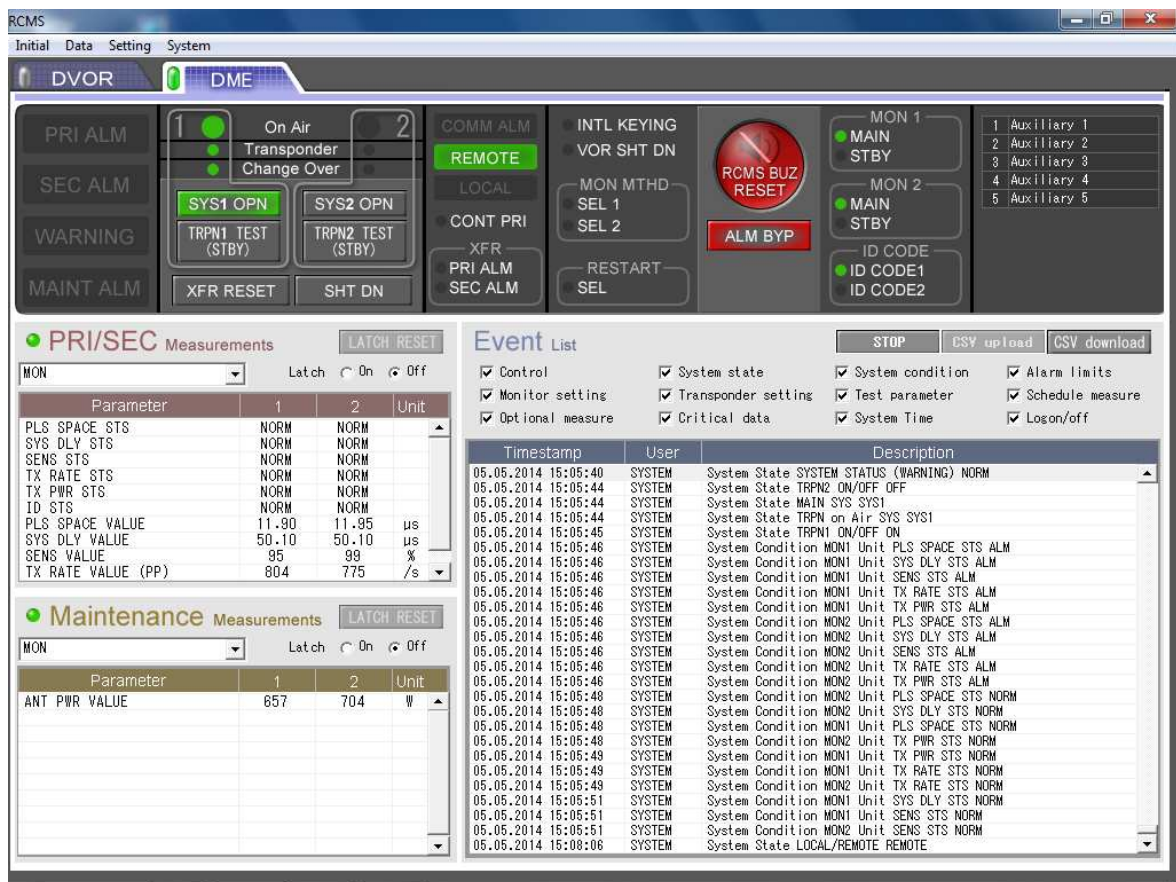
☐ Pulse
 ☐ Tone

☐ Remote IP

☐ Local IP

Delete Station
 Entry
 Close

- (4) Main Screen of RCMS is opened when username and password is certificated. For more information about the operation, see the Operational Guidance of RCMS.



1.6 Mechanical check items

There are no Mechanical items.

CHAPTER 2 Periodical replacement parts

2 Periodical replacement parts

Periodical replacement parts are shown below.

Table 2-1 Periodical replacement parts

No.	Product name	Manufacturer	Replacement cycle	Note
1	LCD Unit, Battery	Interface Co., Ltd.	10 year	(*1)

(*1)

This replacement parts can be exchanged by manufacture.

If the battery works out, the system clock is reset, each time the power source is turned off.

CHAPTER 3 Repairing mechanical parts

3 Repairing mechanical parts

There are no mechanical reparable parts.

CHAPTER 4 Trouble shooting

4 Trouble shooting

Table 4 shows the list of alarm and typical cause displayed on LCD or RCMS, and how to deal with the problems. Additionally Section 4.1 shows the troubleshooting for errors using flowcharts.

Table 4 Display alarm Recommended action (1/2)

No.	Failure item	Probable cause	Recommended action	Reference check method
1	COM Warning – CONT Unit	1. LCD Unit failure. 2. CONT Unit failure. 3. Link cable failure.	1. LCD Unit Reboot or exchange 2. CONT Unit Reboot or exchange 3. Checking cable	—
2	COM Warning – MON Unit	1. LCD Unit failure. 2. MON Unit failure. 3. USB Converter failure. 4. Link cable failure.	1. LCD Unit Reboot or exchange 2. MON Unit Reboot or exchange 3. USB Converter Reboot or exchange 4. Checking link cable	—
3	COM Warning – TRX Unit	1. LCD Unit failure. 2. MON Unit failure. 3. USB Converter failure. 4. Link cable failure.	1. LCD Unit Reboot or exchange 2. TRX Unit Reboot or exchange 3. USB Converter Reboot or exchange 4. Checking link cable	—
4	DC STATUS alarm	1. DC Unit internal DCDC Power supply circuit failure.	1. Checking DC Unit 2. DC Unit Reboot or exchange	1. See maintenance guidance 1.3.4.3
5	HPA STATUS alarm	1. HPA Unit RF power transistor circuit failure.	1. Checking STBY MNT transmitter power. 2. Checking TRX Unit. 3. Checking HP Unit. 4. HPA Unit or TRX Unit exchange.	1. See maintenance guidance 1.3.2.2.1 2. See maintenance guidance 1.3.6.4 3. See maintenance guidance 1.3.8.2
6	MON STATUS alarm	1. MON Unit internal PLL circuit failure. 2. MON Unit internal FPGA circuit failure.	1. Checking MON Unit. 2. MON Unit Reboot or exchange.	1. See maintenance guidance 1.3.7.3
7	TRX STATUS alarm	1. MON Unit internal PLL circuit failure. 2. MON Unit internal FPGA circuit failure.	1. Checking TRX Unit. 2. TRX Unit Reboot or exchange.	1. See maintenance guidance 1.3.6.4

Table 4 Display alarm Recommended action (2/2)

No.	Failure item	Probable cause	Recommended action	Reference check method
8	MON SELF alarm	1. MON Unit failure.	1. Checking MON Unit. 2. MON Unit Reboot or exchange.	1. See maintenance guidance 1.3.7.3
9	MON PLS SPACE STS alarm	1. MON Unit failure. 2. TRX Unit failure. 3. CONT Unit failure. 4. Coaxial cable failure.	1. Checking MON Unit. 2. Checking TRX Unit. 3. Checking CONT Unit. 4. MON Unit Reboot or exchange. 5. TRX Unit Reboot or exchange. 6. Checking Coaxial cable connect	1. See maintenance guidance 1.3.7.3 2. See maintenance guidance 1.3.6.4 3. See maintenance guidance 1.3.5.2
10	MON SYS DLY STS alarm			
11	MON SENS STS alarm			
12	MON ID STS alarm			
13	MON PWR STS alarm	1. HPA Unit RF power transistor circuit failure. 2. CONT Unit RF changeover circuit or FPGA circuit failure. 3. Antenna failure or RF main coaxial cable failure.	1. Checking STBY MNT transmitter power. 2. Checking HPA Unit. 3. Checking CONT Unit. 4. Checking REFL VIDEO level 5. Checking antenna and RF main coaxial cable.	1. See maintenance guidance 1.3.2.2.1 2. See maintenance guidance 1.3.6.4 3. See maintenance guidance 1.3.5.2 4. See maintenance guidance 1.3.5.2.3
14	ROM STATUS abnormal (CONT/NON/TRX)	1. CONT Unit failure. 2. MON Unit failure. 3. TRX Unit failure.	1. CONT Unit Reboot or exchange. 2. MON Unit Reboot or exchange. 3. TRX Unit Reboot or exchange.	—
15	RCMS between LCD Unit communication alarm	1. LCD Unit failure. 2. Communication network line failure.	1. Checking LCD Unit. 2. Checking link RCMS between LCD Unit. (ping···etc)	1. See maintenance guidance 1.3.3.2

4.1 Overview

Troubleshooting for errors occurred in the DME device will now be explained using a flowchart.

(See Figure 4.1-1)

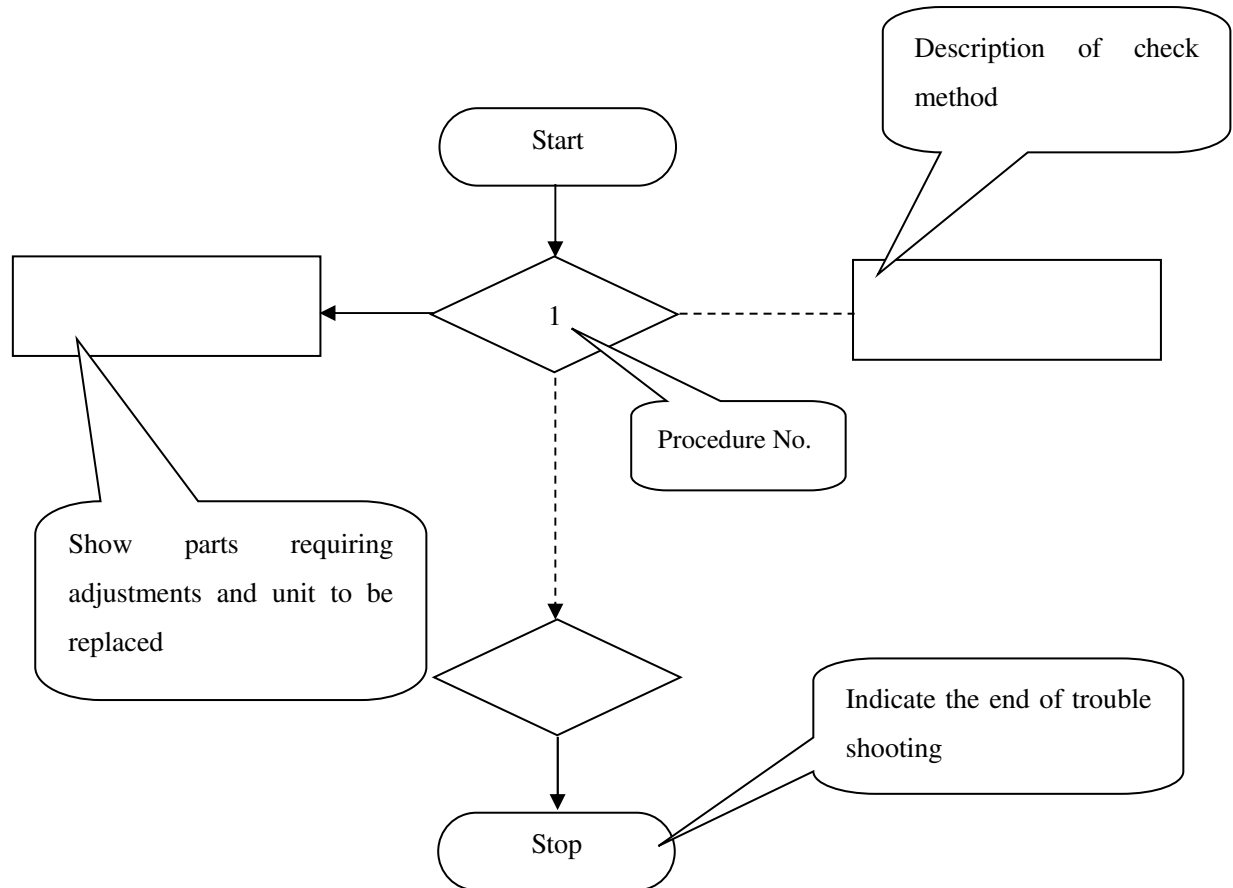
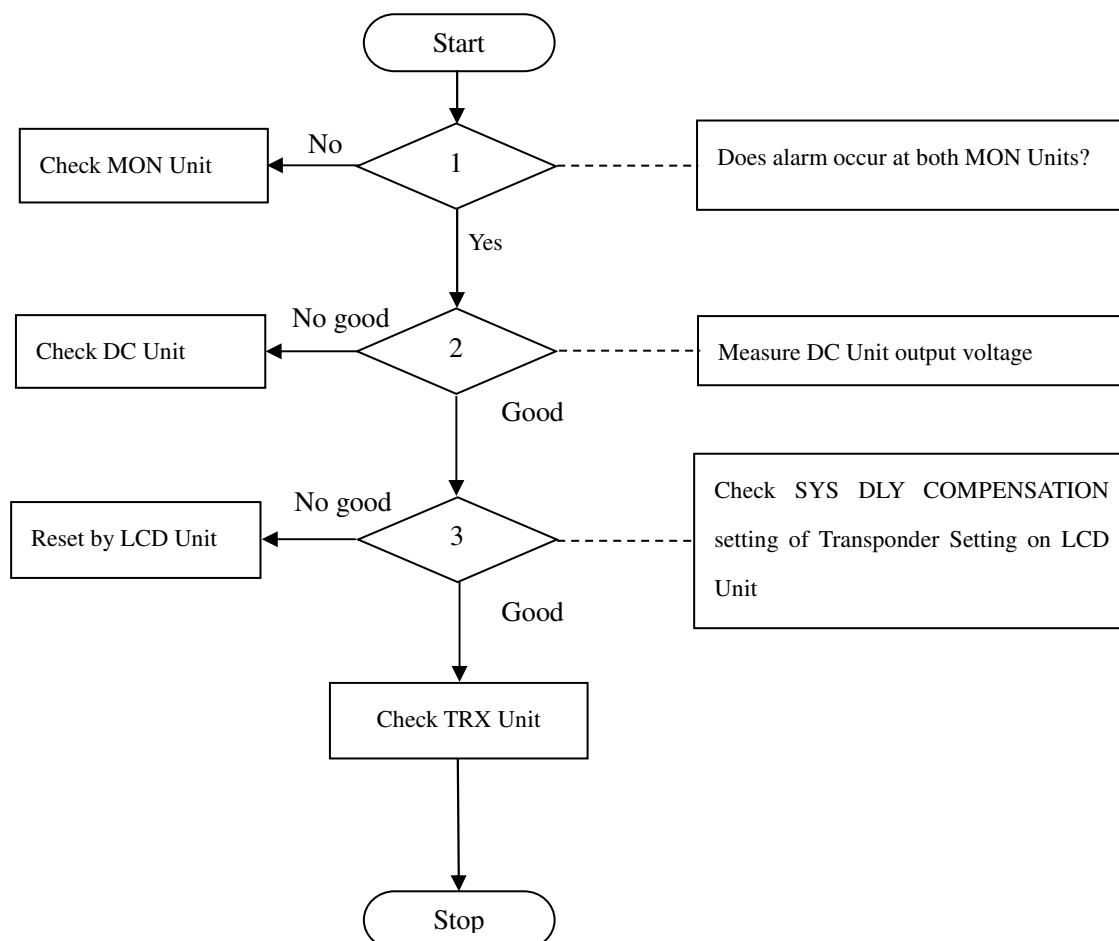


Figure 4.1-1 Explanation of flowchart

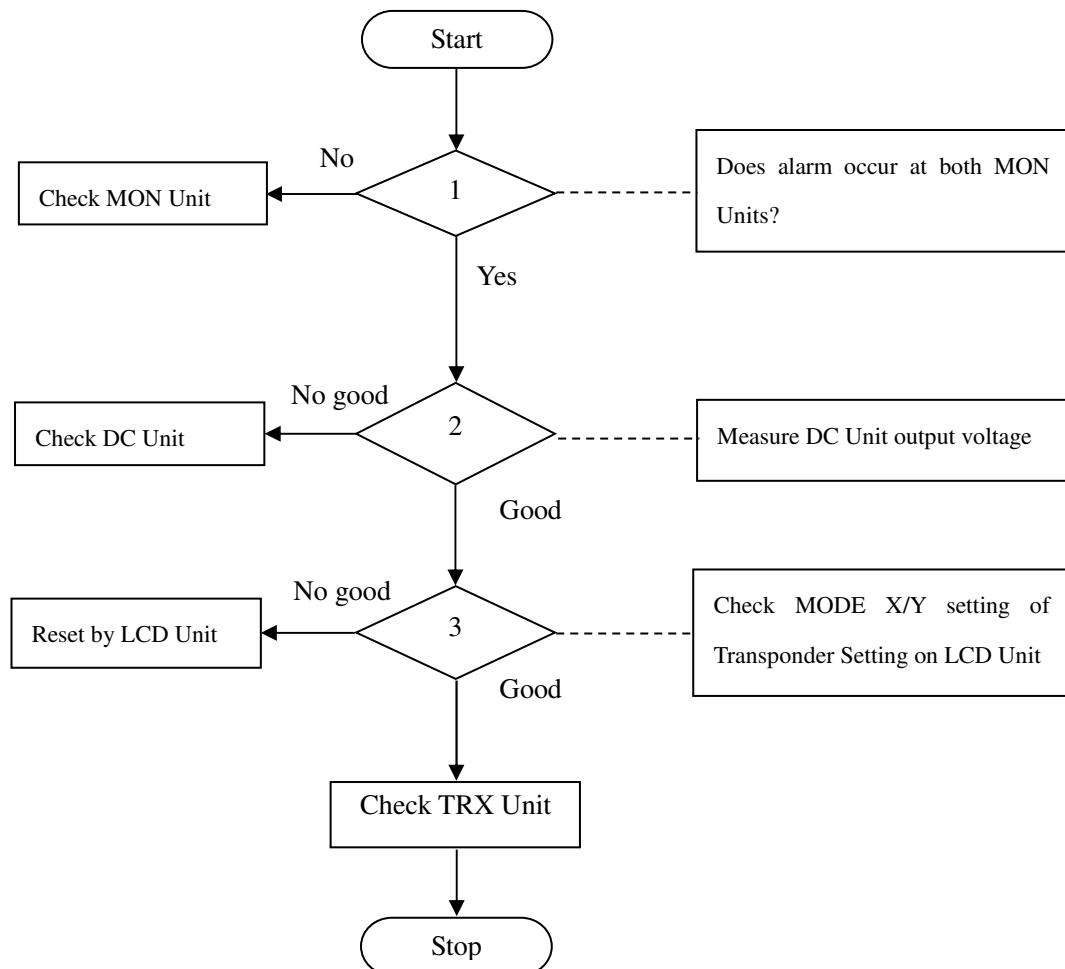
4.2 Trouble shooting by symptom

This is a flowchart to determine which component caused an alarm from the monitor.

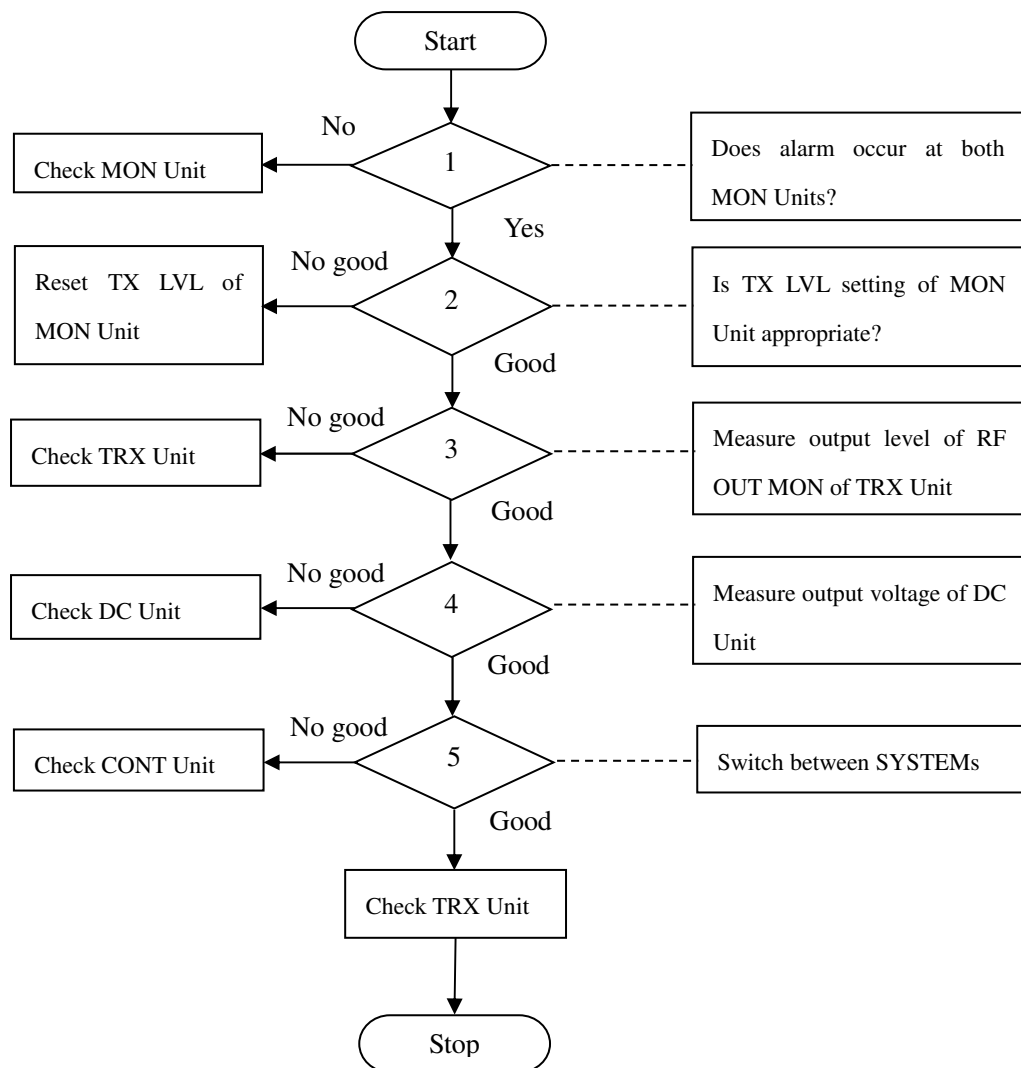
4.2.1 SYS DLY (System Delay) Alarm



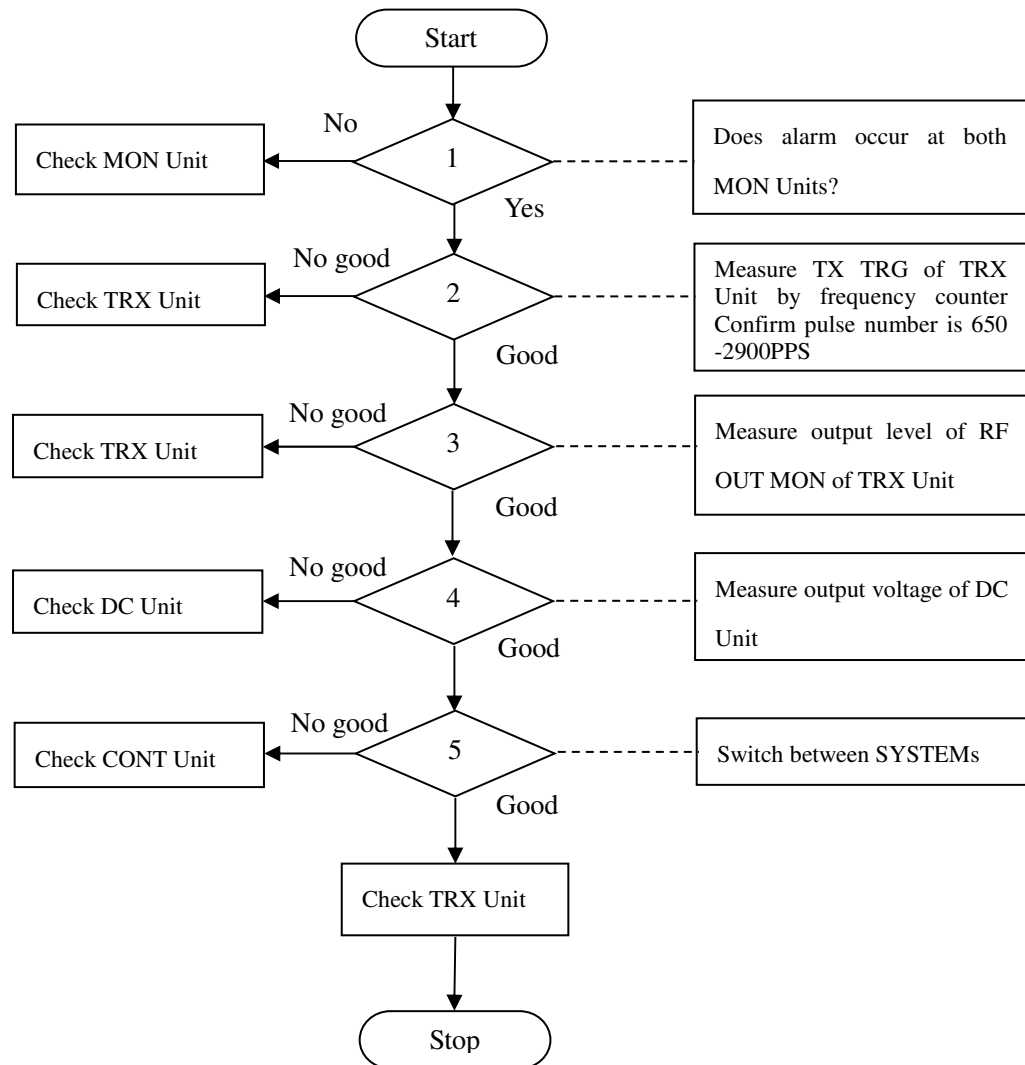
4.2.2 PLS SPACE (Pulse Space) Alarm



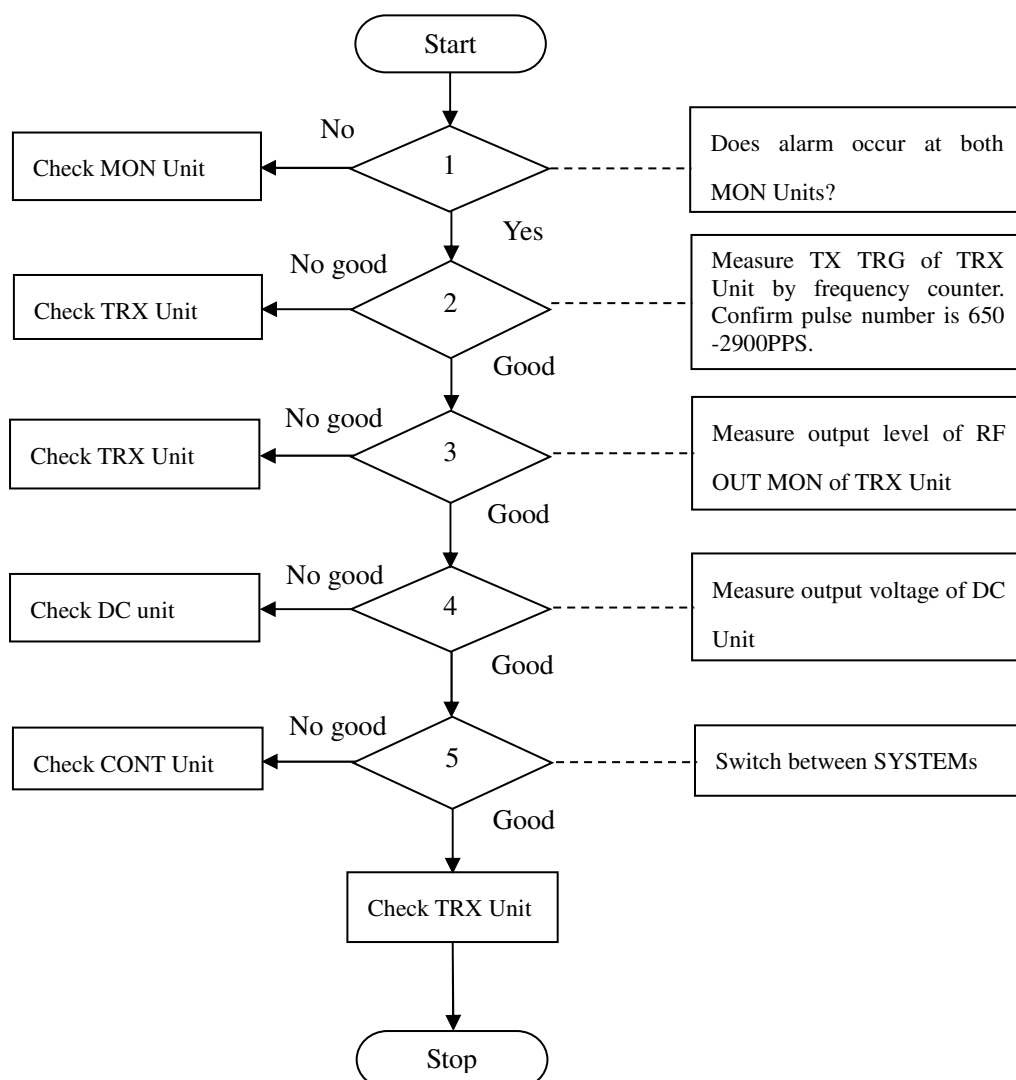
4.2.3 SENS (Sensitivity) Alarm



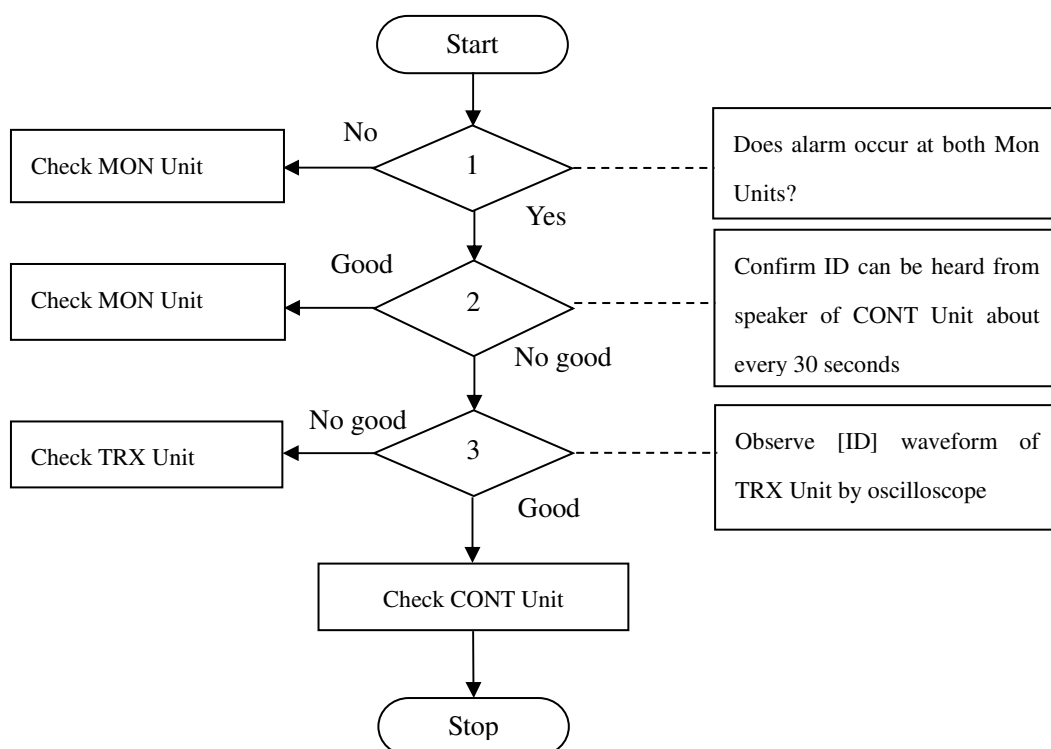
4.2.4 TX RATE (TX Pulse Rate) Alarm



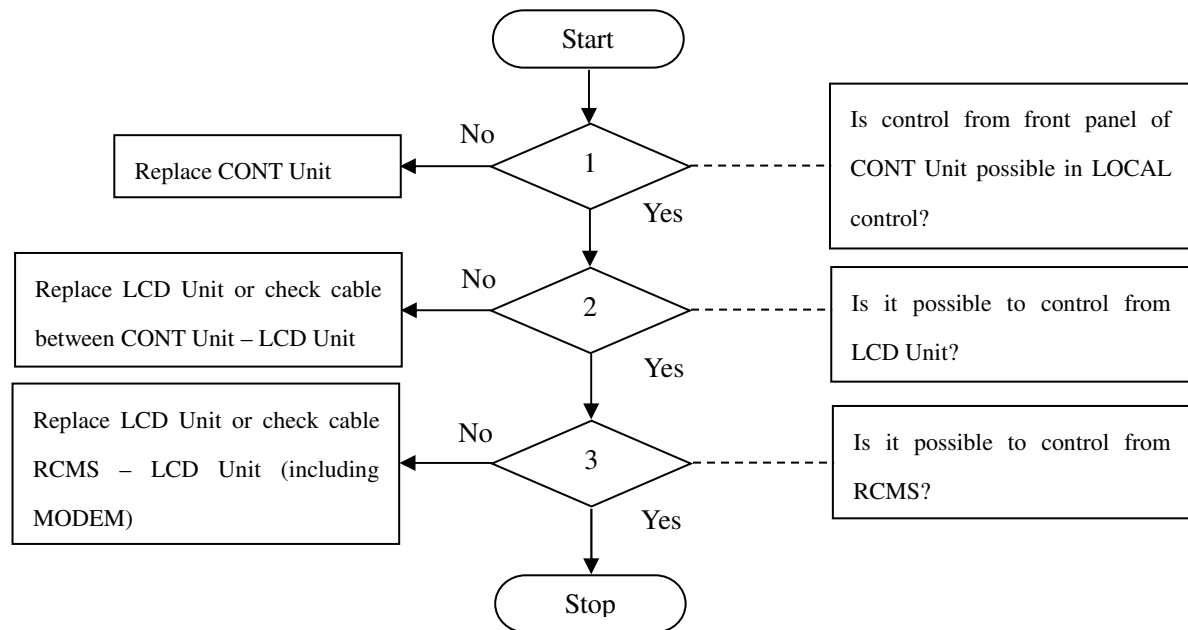
4.2.5 TX PWR (TX Power) Alarm



4.2.6 ID Alarm



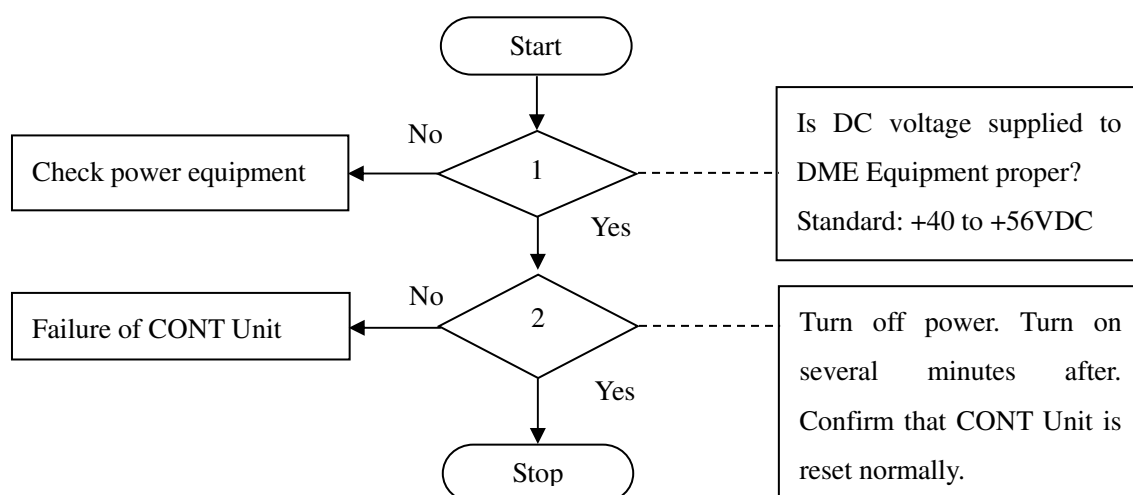
4.2.7 Control and monitoring action



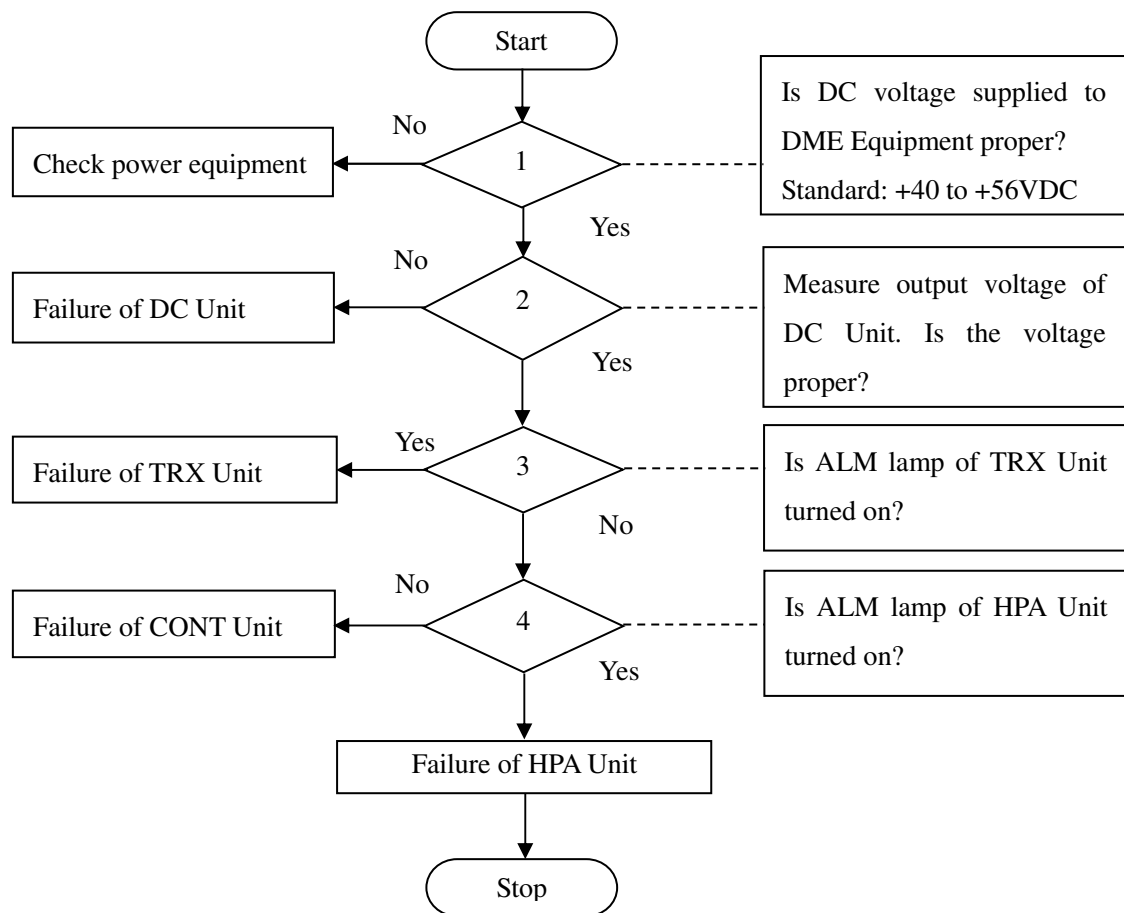
4. 3 Trouble shooting by component

This section shows procedures to investigate whether a part or a unit is broken in a broken component using flowchart.

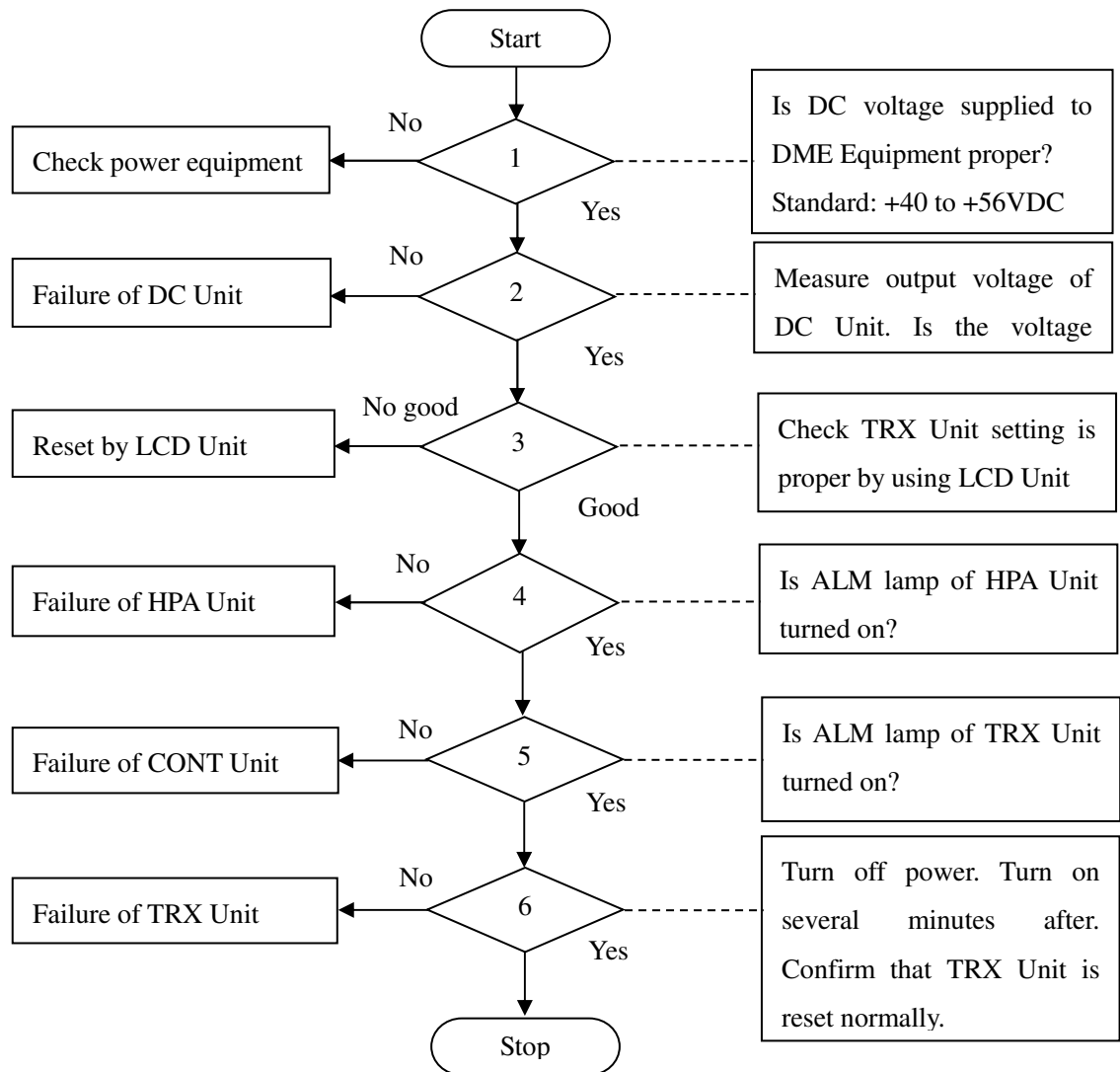
4.3.1 CONT Unit



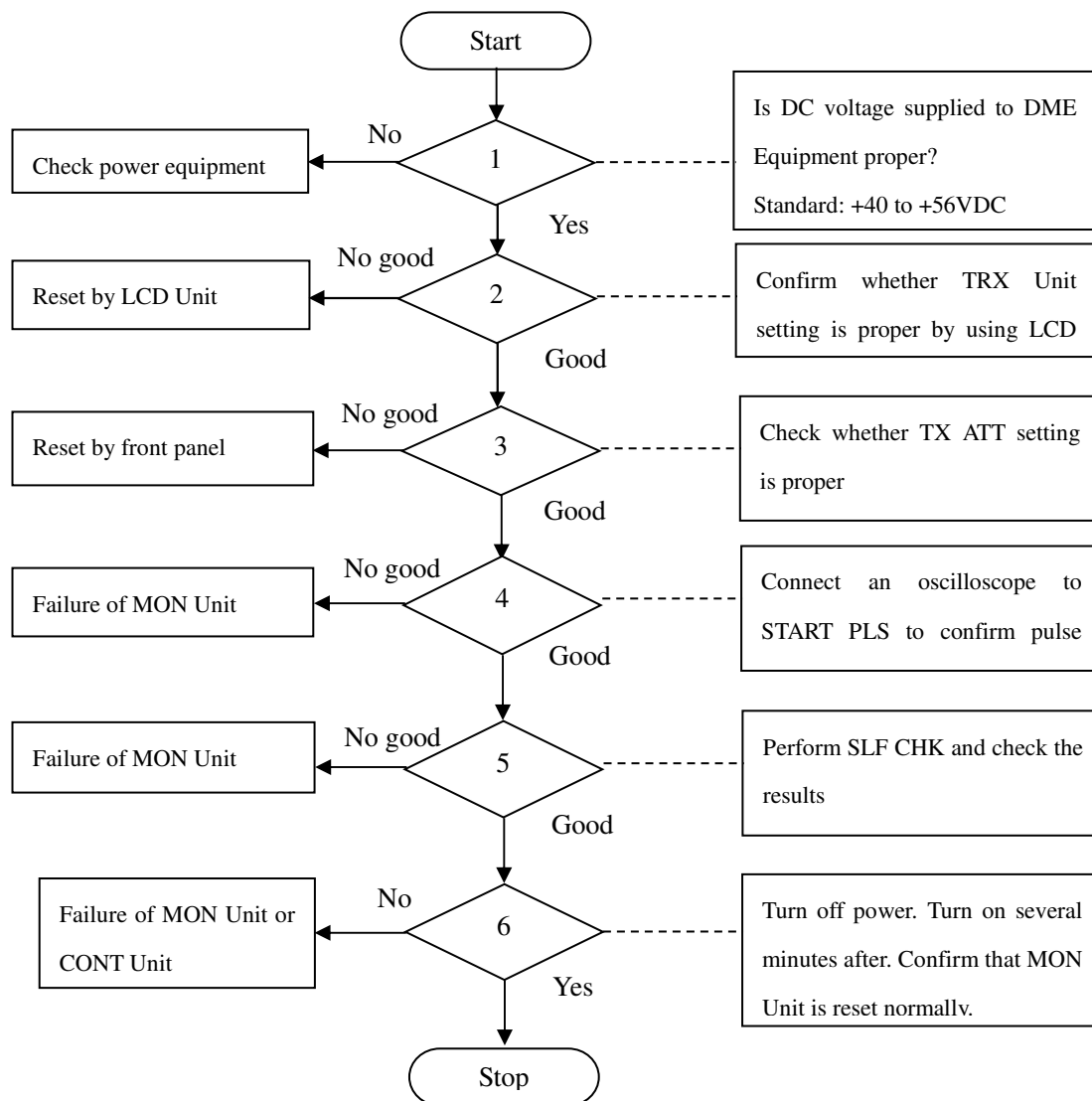
4.3.2 HPA Unit



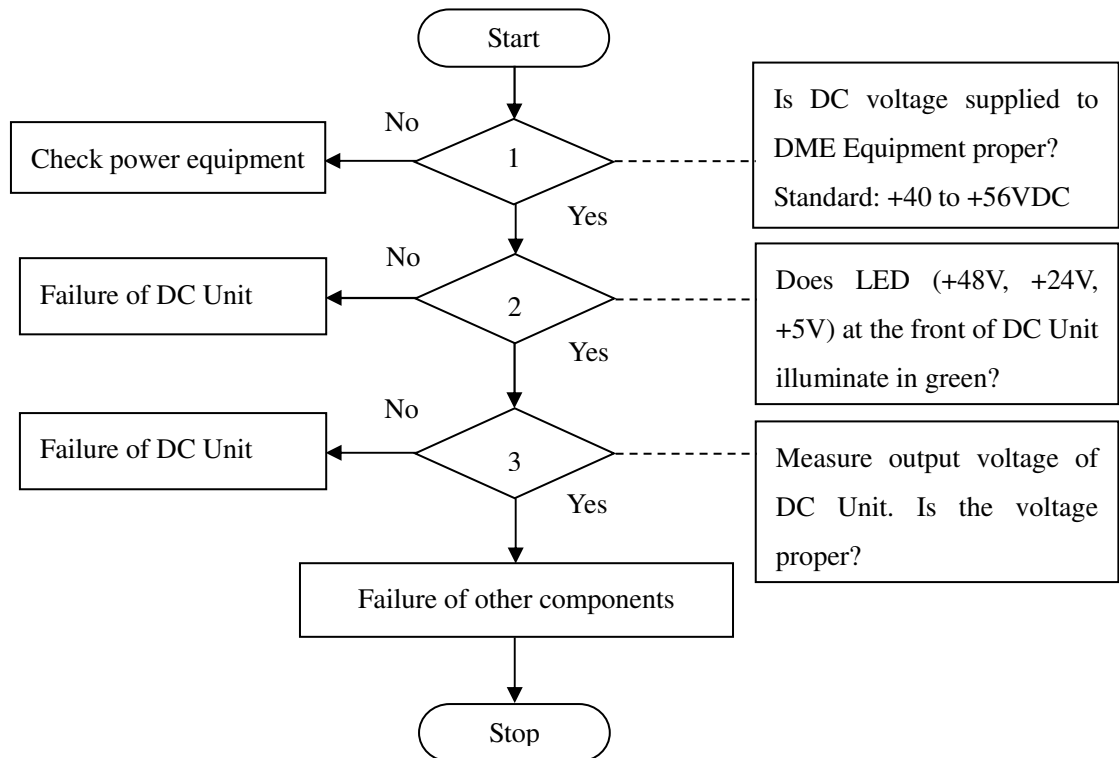
4.3.3 TRX Unit



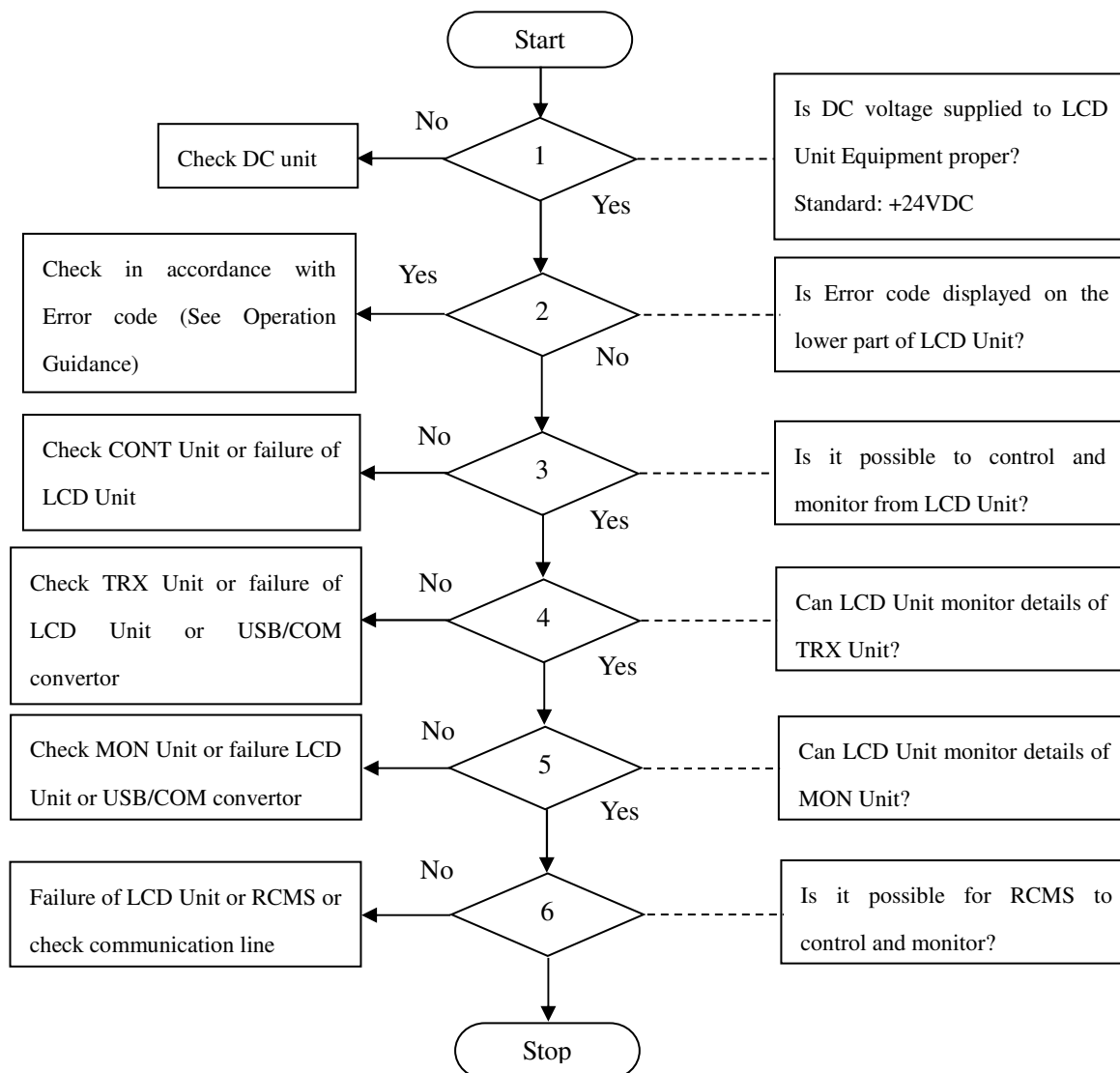
4.3.4 MON Unit



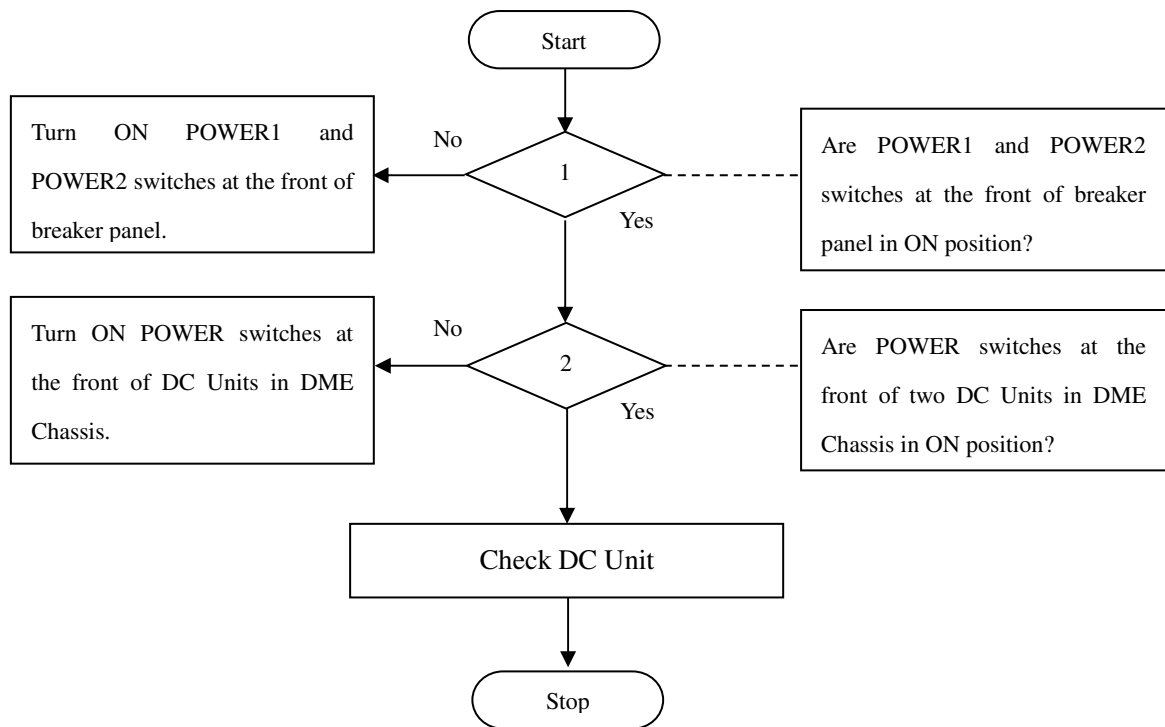
4.3.5 DC Unit



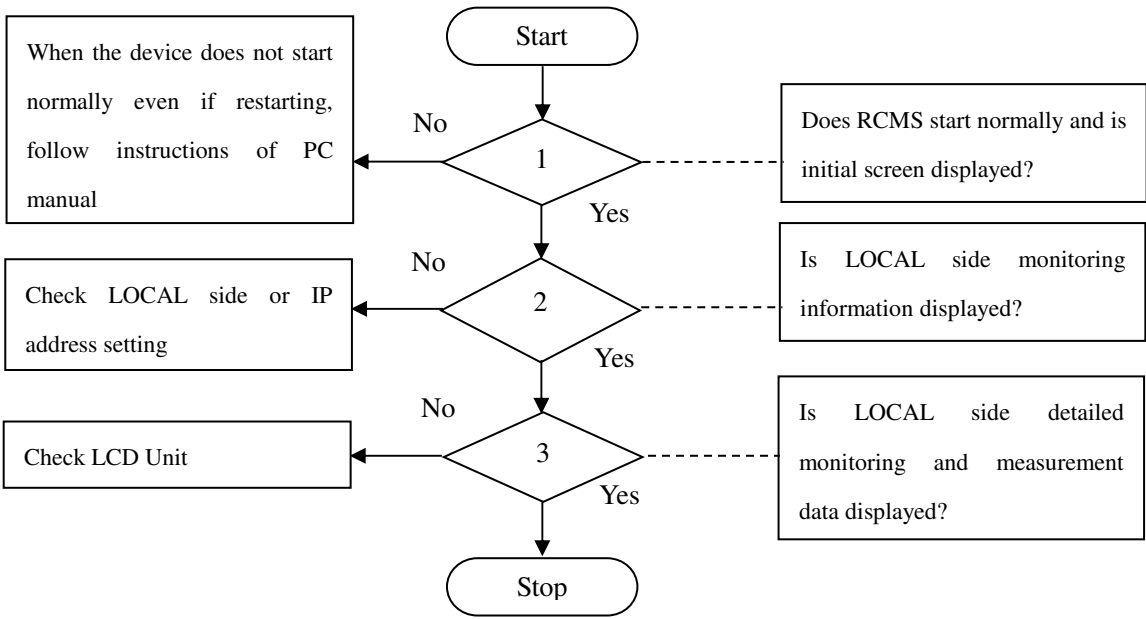
4.3.6 LCD Unit



4.3.7 Power Supply



4.3.8 RCMS



EU Declaration of Conformity (DoC)

The regulation references	
	Radio Equipment directive: 2014 / 53 / EU
The Name and address of the manufacture	
	Toshiba Infrastructure Systems & Solutions Corporation Komukai Complex 1, Komukai, Toshiba-cho, Saiwai-ku Kawasaki 212-8581 Japan
Product description	
	DME
Description of procedure followed in order to declare conformity of Radio Equipment directive: 2014 / 53 / EU	
	Toshiba corporation have read and understood the essential requirements pertaining to the DME Model No. TW4134A to Z. Toshiba declares the DME TW4134A to Z meets all applicable essential requirements of Radio Equipment directive: 2014 / 53 / EU
All the relevant provisions met by the constituent	
	ICAO Annex 10 6 th Ed. EN 50383, EN 50385 EN 60215+A1+A2 EN 61000-4-4, EN 61000-4-6 EN 301 489-1, EN 301 489-22
Name and address of notified body	
	Radio Equipment directive Notified Body: Telefication Edisonstraat 12A, 6902 PK Zevenaar, The Netherlands Notified body number 0560



BE	BG	CZ	DK	DE	EE	IE	EL	ES	FR	HR	IT	CY	LV
LT	LU	HU	MT	NL	AT	PL	PT	RO	SI	SK	FI	SE	UK

TOSHIBA