Operation Manual
for
THE NTG-560 SOLID STATE TRANSMITTER / RECEIVER

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JRC Japan Radio Co., Ltd.

Revision Hsitory

Revision	Description	Issued

TABLE OF CONTENTS

SAFETY INFORMATION

To prevent harm to those who use this product or other people and damages to property, safety precautions to be followed are described as follows.

★ The degrees of harm and damages caused by misuse with neglecting indications are classified and described as follows.

DANGER	This indication means "Hazard can cause severe injury or
WARNING	This indication means "Hazard can cause injury or only physical damages."

★ Kinds of precautions to be followed are classified and described with the following icons. (A few examples of icons are as follows.)

This icon is to call attentions.

This icon is to prohibit some actions

This icon is to force some actions.

DANGER

Plug in completely

Incomplete plugging may generate heat to cause a shock or a fire.

In case of malfunctions or abnormal conditions (smoke, foul odor, sound, etc.), turn the power off and turn off the breaker of the power distributor.

Unplug

Turn the power off and consult with our company. Do not repair the device by yourself because it is dangerous.

Do not put the device on unstable places(a shaky stand, tilted place, etc.).

Prohibition

Dropping or falling down of the device may cause injury.

Do not wet or water the device.

Do not wet

Wetting the device may cause a shock or a fire.

Do not put things (containers with liquid, flower pots, etc.) or creatures on the device.

Prohibition

Entering of liquid or excrement may cause a shock or a fire.

★ In case of entering, unplug from the outlet and consult with our company.

Do not put liquid such as water, metals or inflammable objects inside the device.

Prohibition

Entering may cause a shock or a fire.

In case of entering, unplug from the outlet and consult with our company.

DANGER

Do not drop or bump the device.

Physical shock may cause a s hock or a fire.

Prohibition

Do not use the device under a voltage other than the indicated power-supply voltage.

Malfunction may occur to cause a shock or a fire.

Prohibition

Do not remove the back lid, the cabinet or the cover, or do not modify the device.

Consult with our company for internal inspection and repair.

Do not decompose

When thunder has started, do not touch the power cables, the signal cables and the device.

Touching will cause a shock

Do not touch

Do not damage the power cord or the plug.

Damaging, processing, loading, heating, bending and twisting forcedly or pulling may deteriorate insulation of coating, expose cores or break the cord to cause a shock or a fire.

Prohibition

★ In the case of damages, unplug from the outlet and ask our company

WARNINGS

Carry the CRT monitor by more than one people since the monitor is heavy.

Stumbling, etc. may cause injury.

Disconnect the plug and the connection lines when moving the device.

Damage of cords may cause a shock or a fire.

Unplug

Unplug with holding the plug.

Damage of cords may cause a shock or a fire.

Unplug

Unplug from the outlet for safety when maintaining

A shock may be caused.

Unplug

WARNINGS

Do not unplug with wet hands

A shock may be caused.

Prohibition

Do not block the ventilation holes of the cabinet.

Heating up internally may cause malfunction or a fire. Pay attention to the following:

Prohibition

★Do not turn over, lay down or

Do not put the device where much moisture or dust exists, and greasy fumes or steam is generated.

Prohibition

Putting the device on a cooking table or near a heater may cause a shock or a fire.

Ask our company for internal inspection and cleaning periodically.

Without cleaning for a long time, dust gathered inside the device may cause malfunction or a fire.

Unplug from the outlet when not using for a long time.

Dust gathered on the plug may cause a fire or a shock.

Unplug

CAUTIONS

Do not put other devices (a TV, a display device, etc.) or magnetized objects near the CRT monitor. Installing the CRT monitor near those may have an effect on the screen (disturbing colors or swaying the screen).

★Move the device seemed to effect away as possible. In case the phenomenon does not stop even so

Ground the earth wire of the plug.

A shock may be caused without grounding the earth wire.

Furthermore, poor reception for TV's, radios,

Do not put the device in direct sunshine or in the heat of heating apparatus.

Heat may cause deformation of the cabinet or malfunction of parts.

Do not use the device in a dark place at close range for a long time. Using the device in a dark place at close range for long time may weary eyes or weaken eyesight.

★Use the device at a distance of 40 or 50 cm in a bright place where newspaper can read easily. Take a rest for eyes every 30 minutes.

Do not contact the cabinet with rubber or plastic products for a long time.

The quality of the cabinet may alter or the coating may come off.

1. Overview

This manual describes operation function of the NTG-560 Solid State Transmitter-Receiver that is used for the land based radar surveillance system.

Figure-1.1 shows total system illustration diagram of the NTG-560 and peripheral equipments. And Figure-1.2 shows functional data flow of the NTG-560.

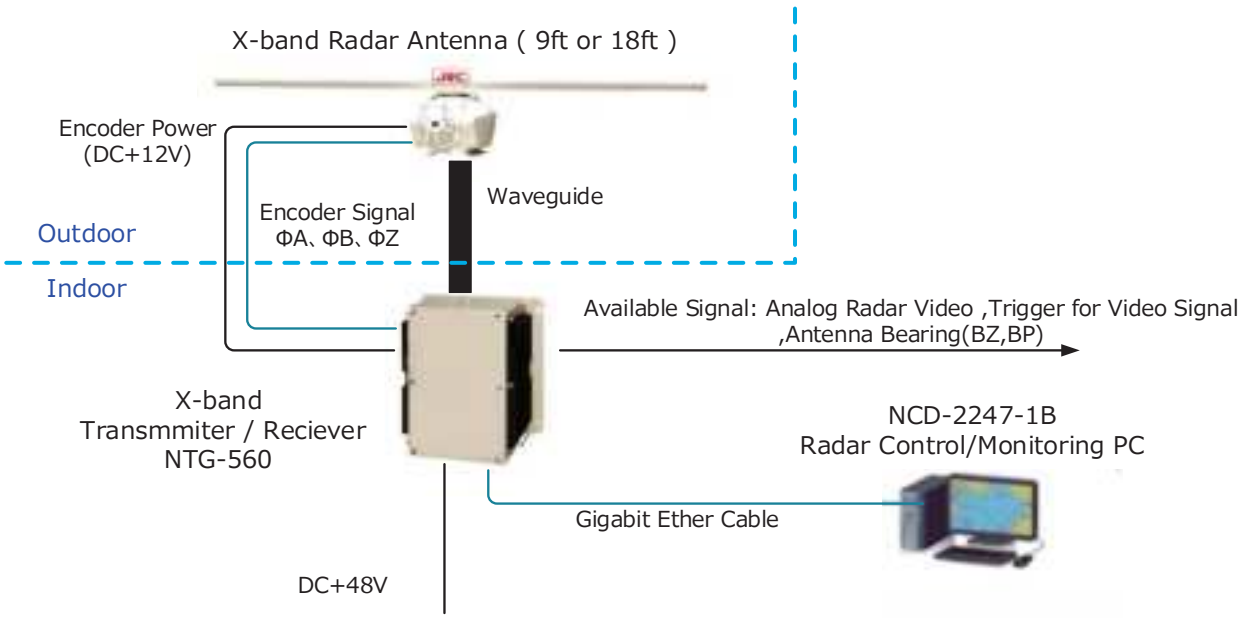


Figure-1.1 Total System Illustration Diagram of the Radar System.

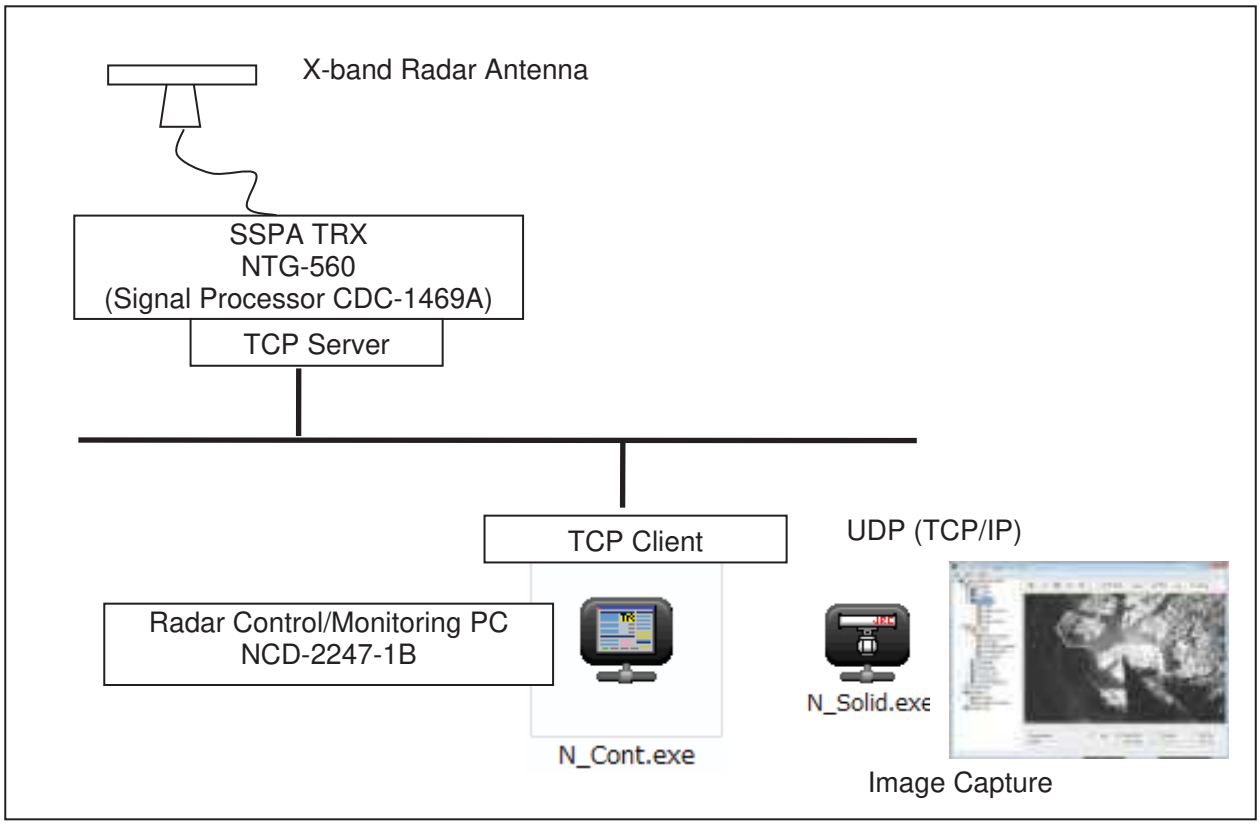
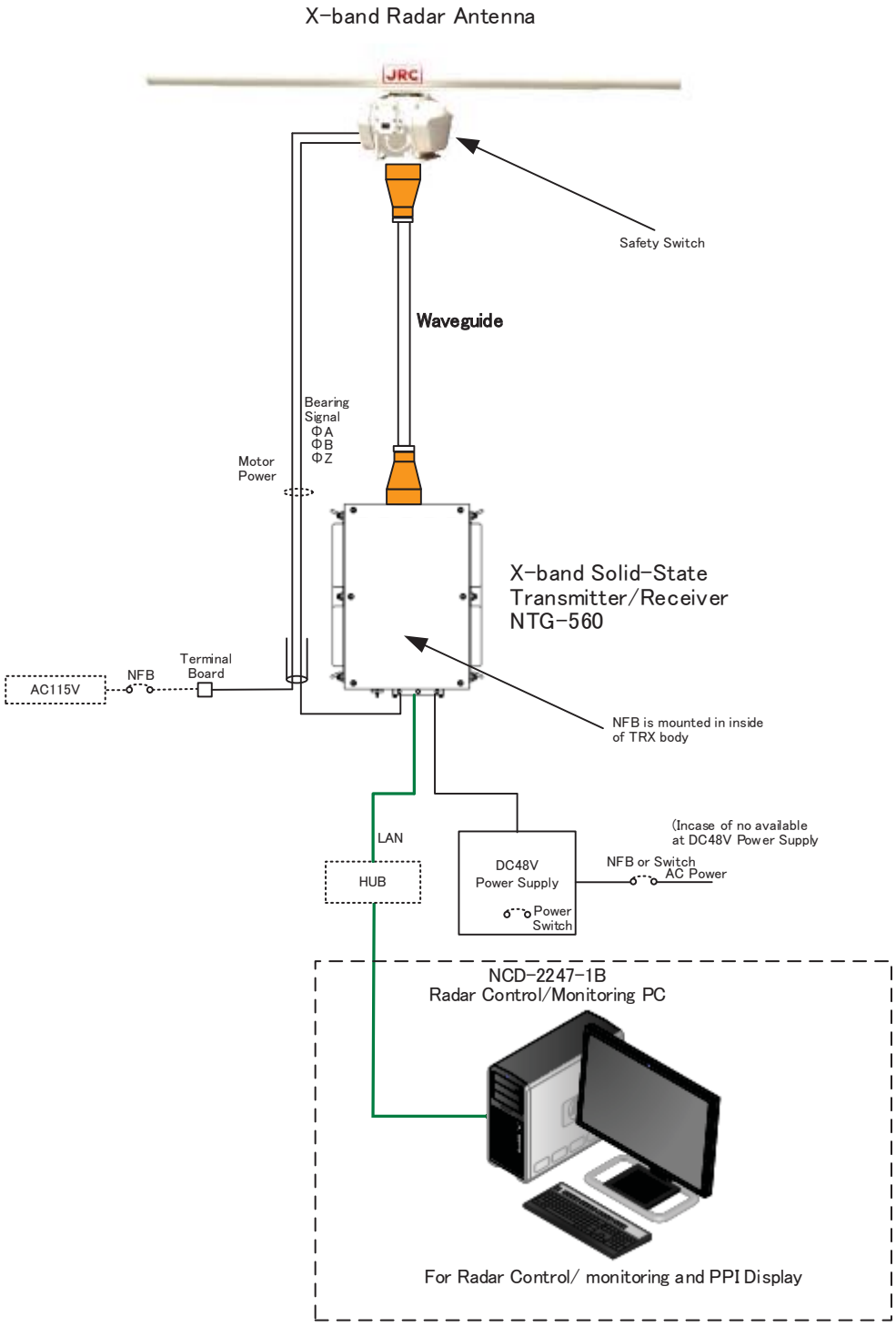


Fig. 1.2 Functional Data flow of the Radar System

2. Operation

2.1 How to start the system

1) Turn on the DC48V Power Supply by it's switch or attached NFB.



2) Turn on the power switch on the NCD-2247-1B

3) Open the main menu Window (CDC-1469 control module by LAN (NMEA).
See paragraph 2.3

4) Confirm the no error indication on main menu.

5) Turn on Antenna motor NFB.

Before turn on, It checks that there are no people near the antenna.

6) Click the Transmit ON button on the main menu

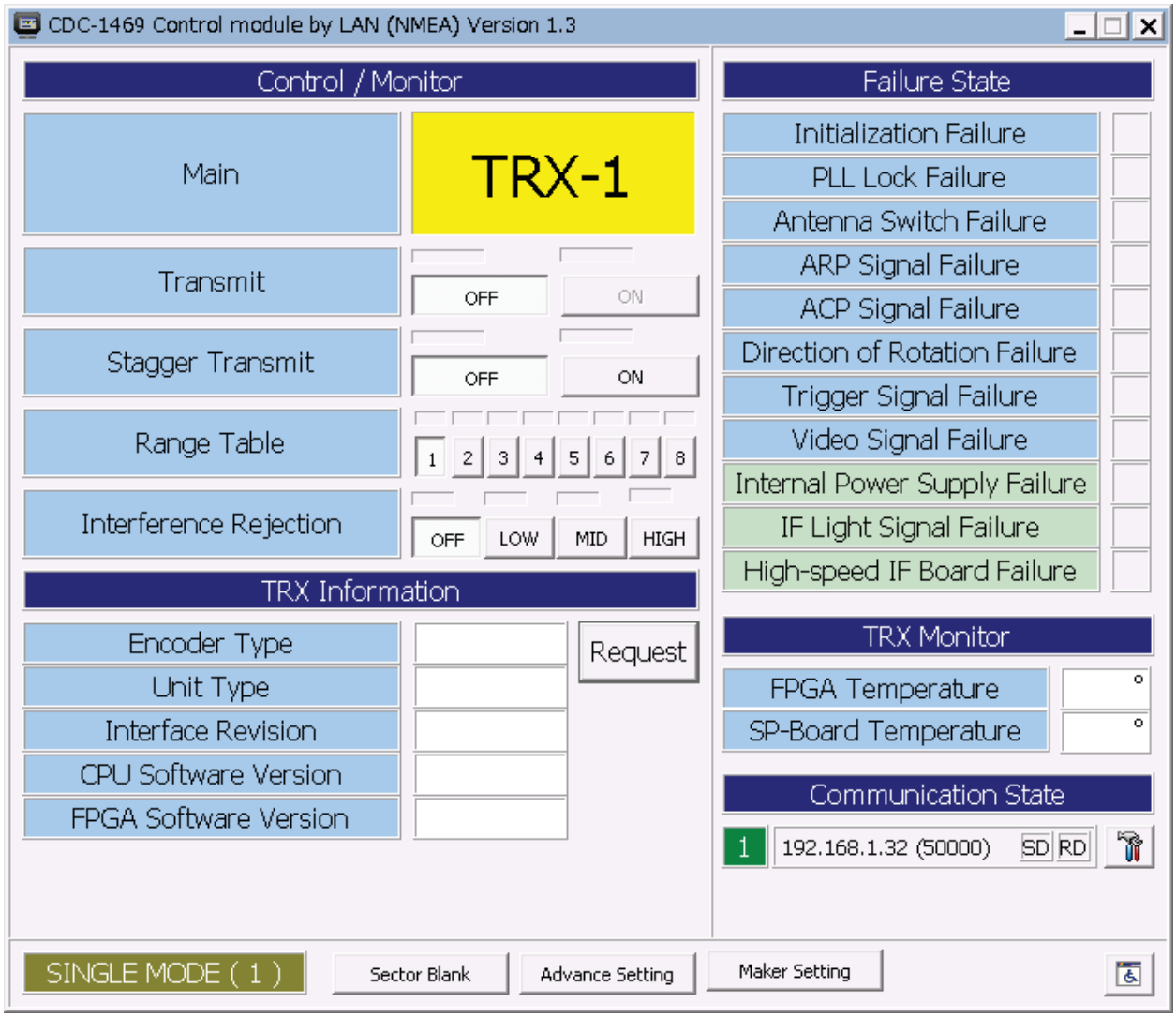
7) Echo will appear on the “Solid State radar Signal Input Module window”. See paragraph 2.4

2.2 How stop the System.

1) Stop the system by reverse procedure of the how to start.

2.3 Radar Control Module (N_Cont. exe) Main Window

The following indication will be displayed when NTG-560 and NCD-2247-1B are connected normally.



SIGNAL MODE(1) window menu

Control/Monitor

Main :TRX-1 displayed

Transmit : OFF: Transition turned off, ON: Transmission turned on

Stagger Transmit : OFF: Stagger Transition turned off, ON: Stagger Transmission turned on

Range Table : Selects Range Table shown as table below.

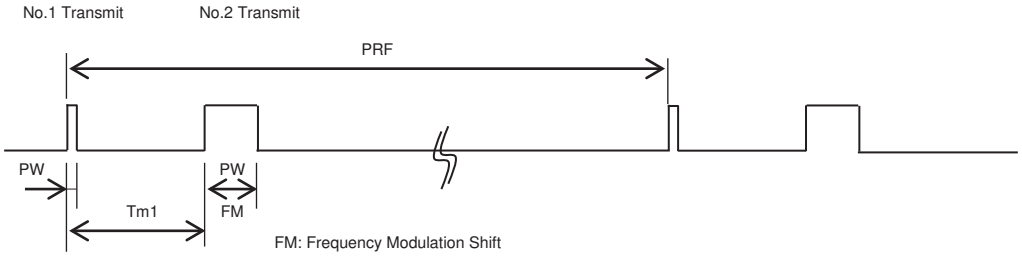
Table No.	No1. Transmit		No.2 Transmit		PRF (Hz)	Tm1 (us)
	PW(us)	FM(MHz)	PW(us)	FM(MHz)		
1	0.07	0	2.8	30	2280	97.52
2	0.15	0	4.6	30	2280	97.52
3	0.3	0	9.1	20	2280	97.52
4	0.15	0	18.3	30	1280	97.52
5	0.15	0	28.0	30	640	97.52
6	0.3	0	9.1	30	1864	97.52
7	0.6	0	9.1	30	1280	97.52
8	0.07	0	2.8	30	4100	97.52

Remarks;

PW: Pulse Width, FM: Frequency Modulation range,

PRF: Pulse Repetition Frequency,

TM1: Time interval between No.1 and No.2 transmission



Interference Rejection: Adjusts the interference rejection strength level

Off / Low / Middle / High

TRX Information

Encoder Type : 2048 (Encoder pulse numbers)

Unit Type : CDC-1469 (Signal Processor Model)

Interface Revision : 00

CPU Software Version : 0000

FPGA Software Version : 0000

Request : Updated when click this button

Failure State

Initialization Failure : FPGA initialization failure.

PLL Lock Failure : PLL lock faiture on the master clock of signal processor.

Antenna Switch Failure : Antenna Safety Switch turned ON.

ARP Signal Failure : Lacked the Antenna encoder reference pulse.

ACP Signal Failure : Lacked the Antenna encoder pulse.

Direction of Rotation Failure : Antenna is reverse rotation.

Trigger Signal Failure : Lacked the Radar trigger signal.

Video Signal Failure : Lacked the radar video signal during specified period.

Internal Power Supply Failure : TRX internal power supply became abnormal condition. TRX.

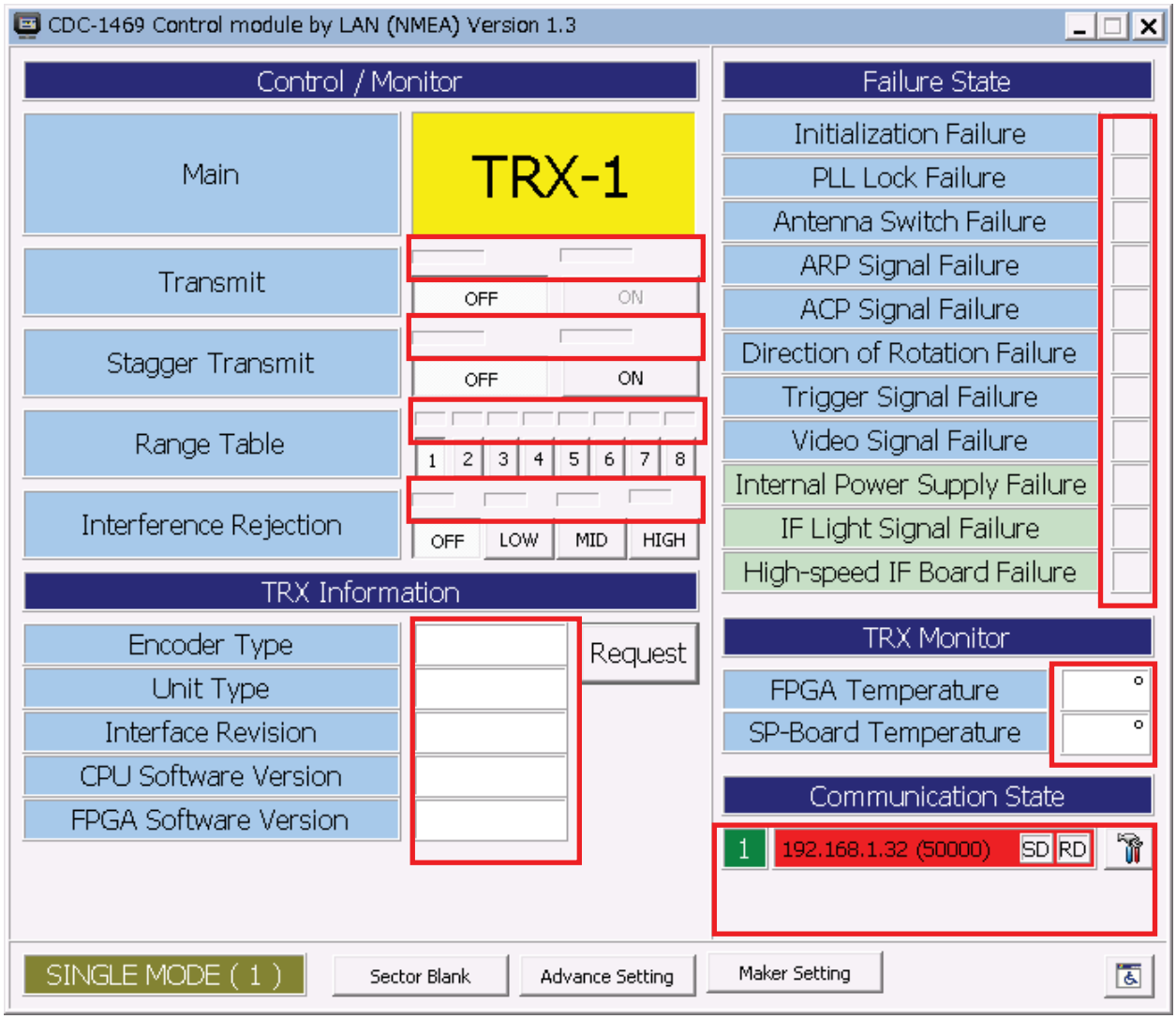
IF Light Signal Failure : IF Optical Fiber signal Lost.
High-speed IF Board Failure : AVAL Optical Board is Failure.

TRX Monitor

FPGA Temperature : xxx° shows temperature
SP-Board Temperature : xxx° shows temperature

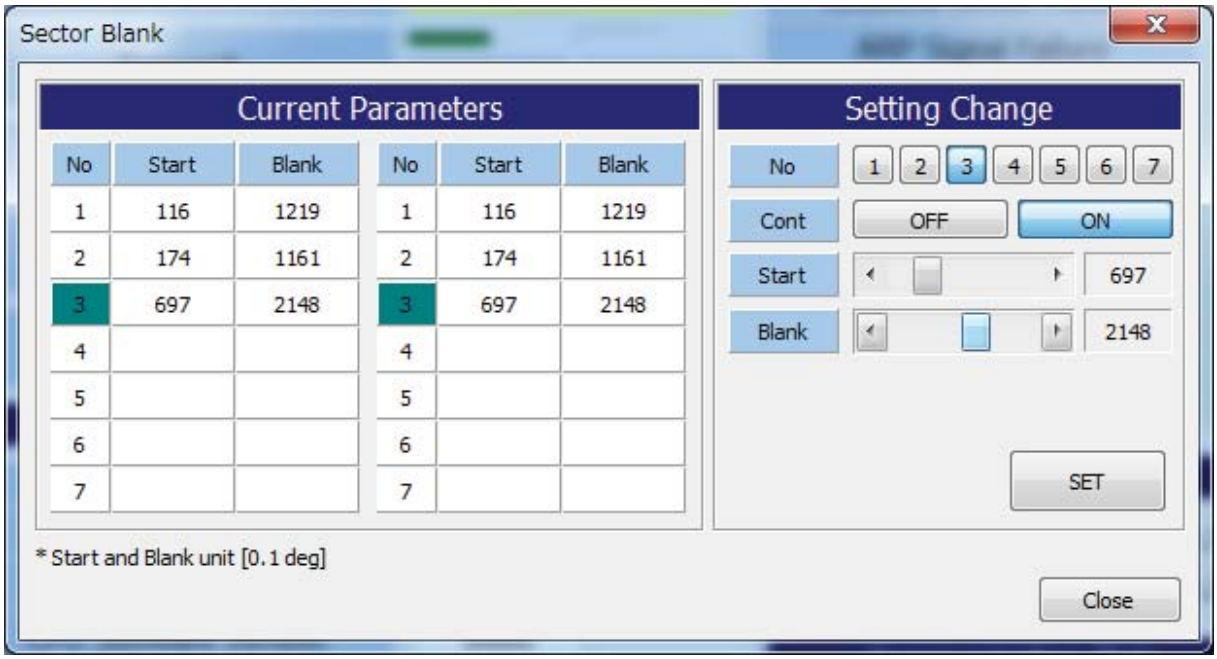
Communication State

1 192.168.1.32(50000) SD RD : Green :Normal condition, Red :Abnormal(See below)

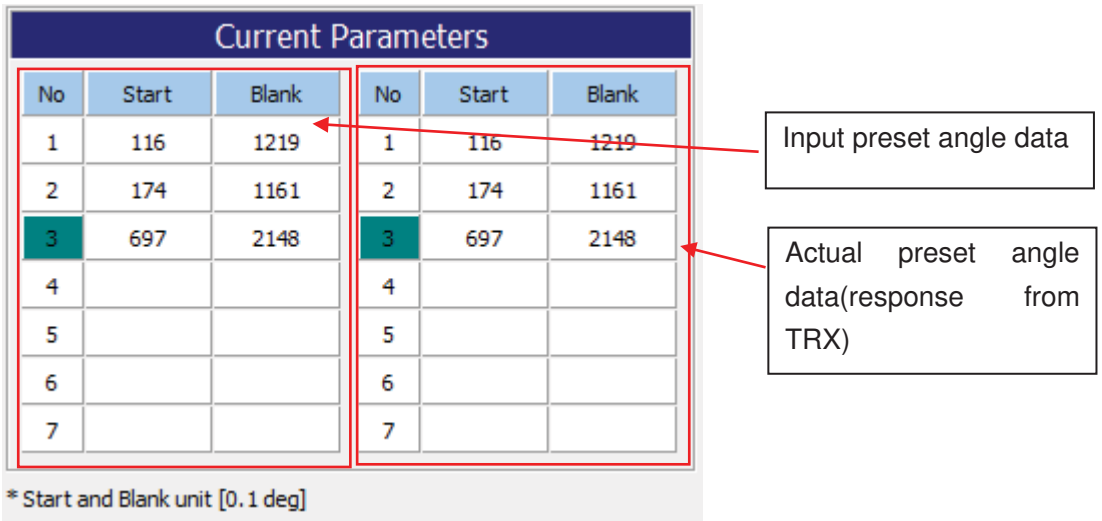


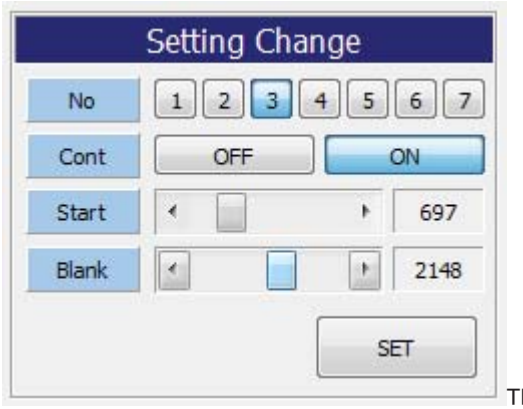
Sector Blank window menu

Transmission Sector blanking angle can be presentable.



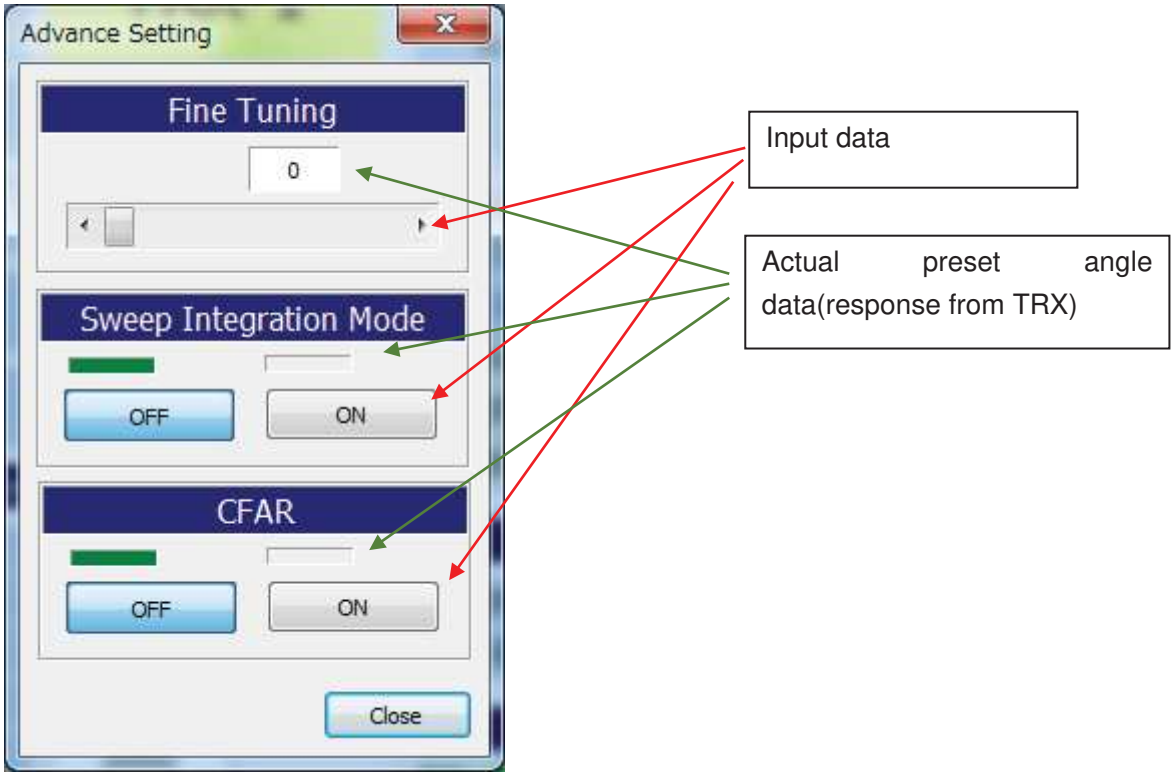
This radar system has 7(seven) sector blanking area which are presentable individually.





The blanking data of an input is reflected by pushing a SET button.

Advanced Setting window menu

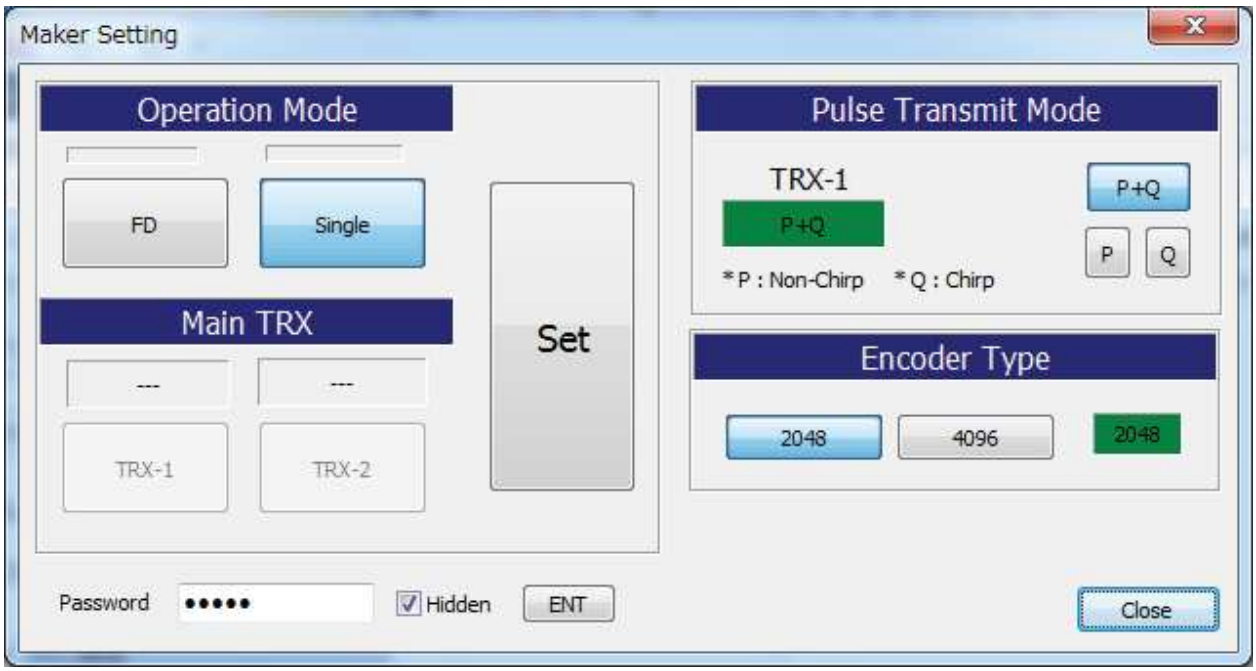


Fine Tuning : Reserved Function.
Sweep Integration Mode : ON or OFF (Reduce the Noise and Clutter echo)
CFAR : ON or OFF (Constant False Alarm Rate)

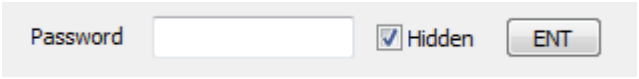
Maker Setting window menu

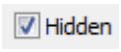
This menu is presented by manufacture's factory, so that please do not change recklessly..

A password input is required when open the maker setting window.
Initial password is “admin”.

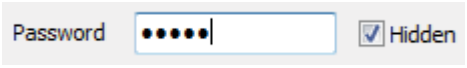


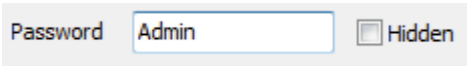
Setting of Password

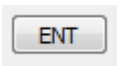




The mask of the inputted password is canceled temporarily.







Click the ENT button and password will be memorized.

* When a blank is set up, attestation with a password is not carried out.
* It is enciphered and the inputted password is saved at an initialization file.

Operation Mode

FD : Not used

Single This system can be used Single only

Main TRX

Not used in this system.

Pulse Transmit Mode (Default is P+Q)

TRX-1 : P+Q (Indicate current transmission mode)

P+Q : Select Both P(non-chirp) and Q(chirp) transmission pulse

P : Select P pulse only

Q : Select Q pulse only

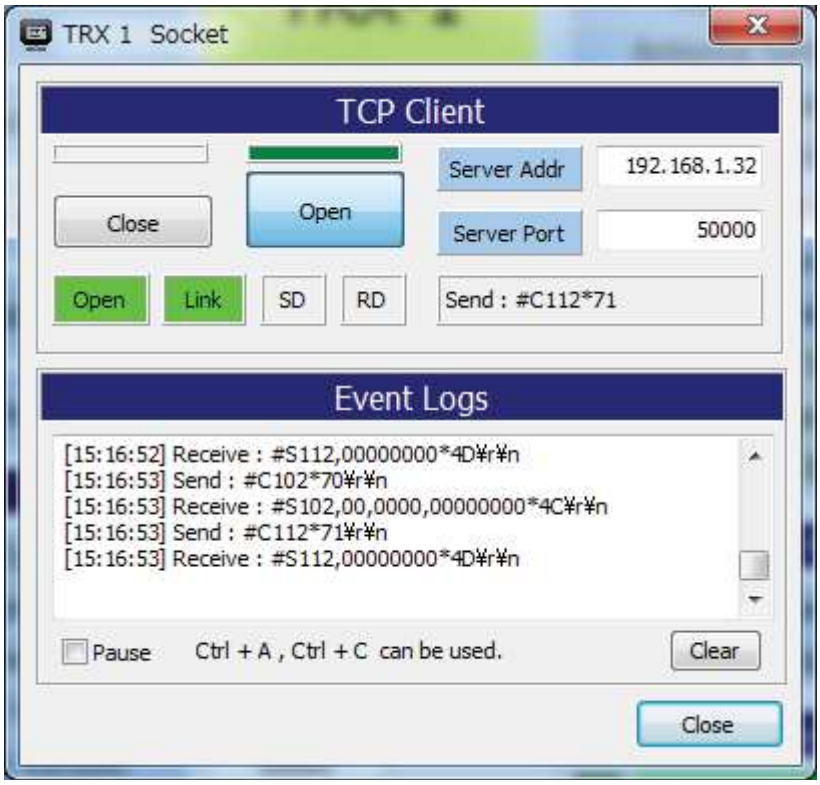
Encoder Type

2048 : Select antenna encoder 2048 pulse type

4096 : Select antenna encoder 4096 pulse type

2048 Green indication (Indicate current selected encoder type)

Communication Preset Window



TCP Client

Open/Close a socket

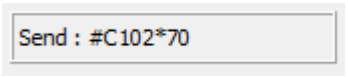
Socket open state

Socket connection state

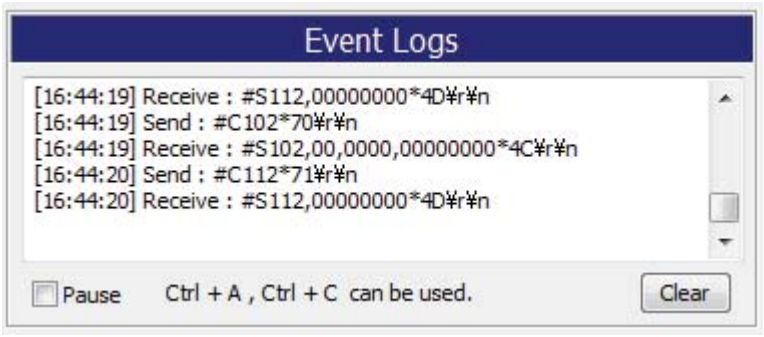
Flashing at sending and receiveing

Server IP address

Server port number

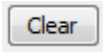


Indicate the communication event



Communication Event Log indication

Update of the log of a communication event is stopped.



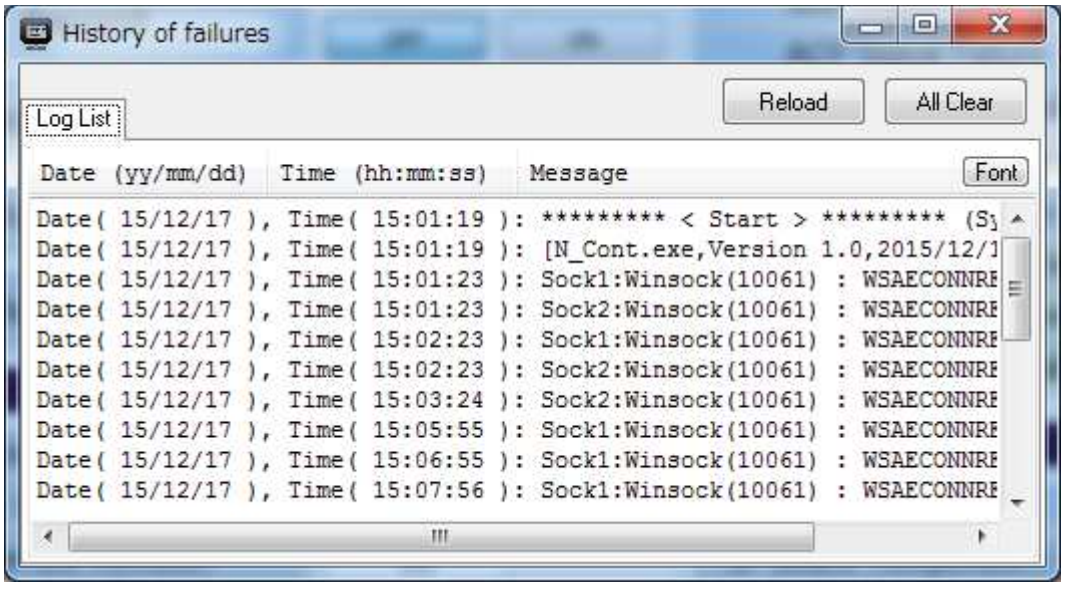
The log of a communication event is cleared.

※ If you want to save the contents that are displayed in the file, copy it to the clipboard using such as Ctrl + A and Ctrl + C, please save the file using Memo-pad etc.

History of Failures Log Window indication

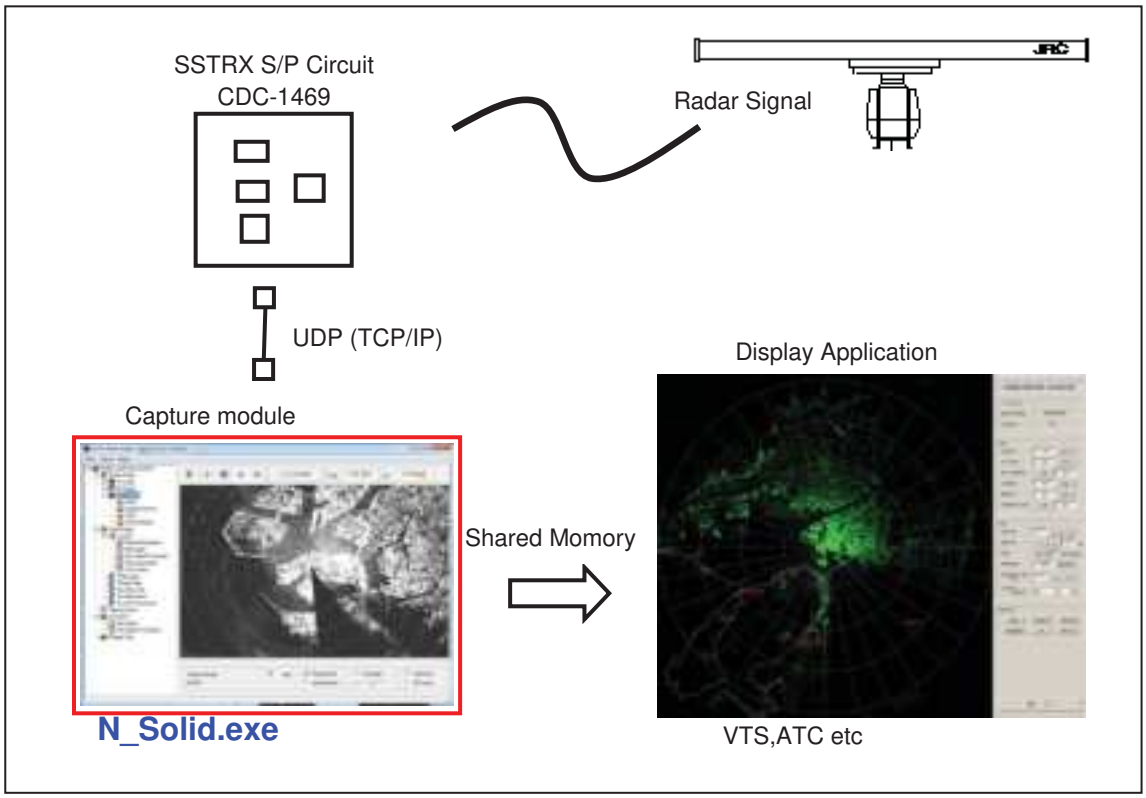
Click the here

The history of failure window displayed.



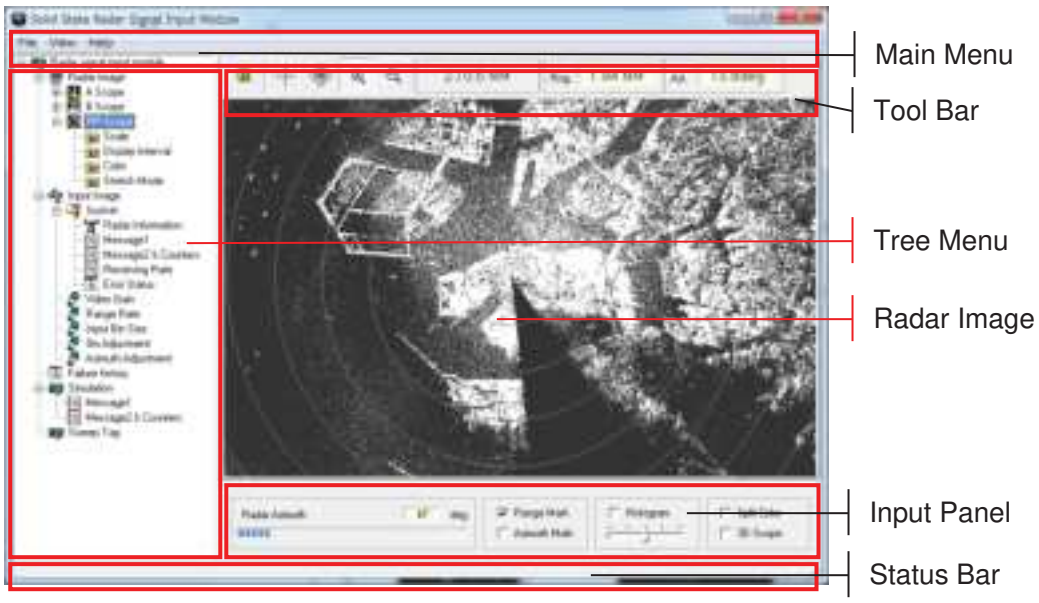
2.4 Solid State Radar Signal Input Module(N_Solid.exe)

This module captures in a radar picture using an UDP socket (TCP/IP) from a solid-state TRX signal processing circuit (CDC-1469). The captured radar picture is provided through a shared memory to other applications. Also, Radar PPI image can be monitored using this module.

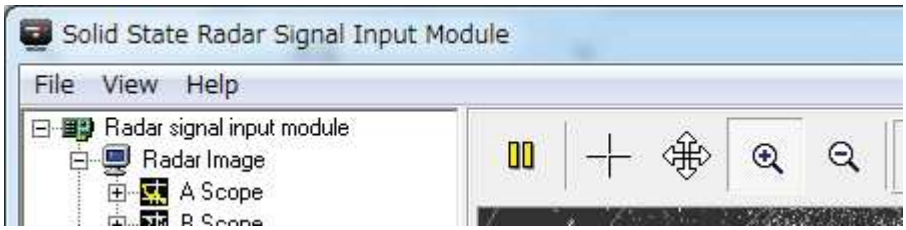


2.4.1 Icon

2.4.2 Start-up the Screen



2.4.3 Main Menu



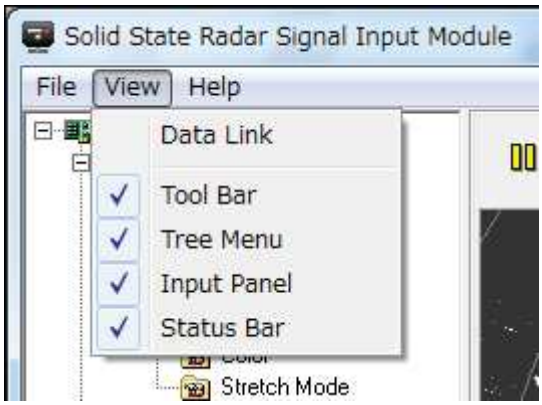
2.4.3.1 File

(1) Exit

Exit the Application

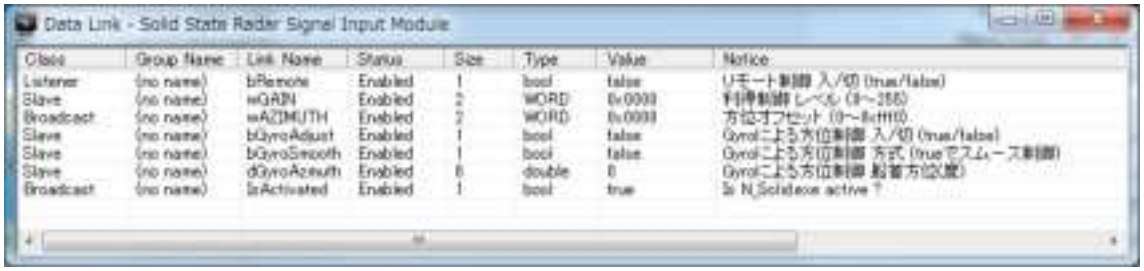
Note: When this application is started according to the launcher process (Stater2.exe) of exclusive use, a window is closed and it operates in the background.

2.4.3.2 View



Data Link：Display the Data Link Screen
Tool Bar：Display on/off of the tool bar
Tree Menu：Display on/off of the tree menu
Input Panel：Display on/off the input panel
Status Bar：Display on/off of the status bar

(1) Data Link screen

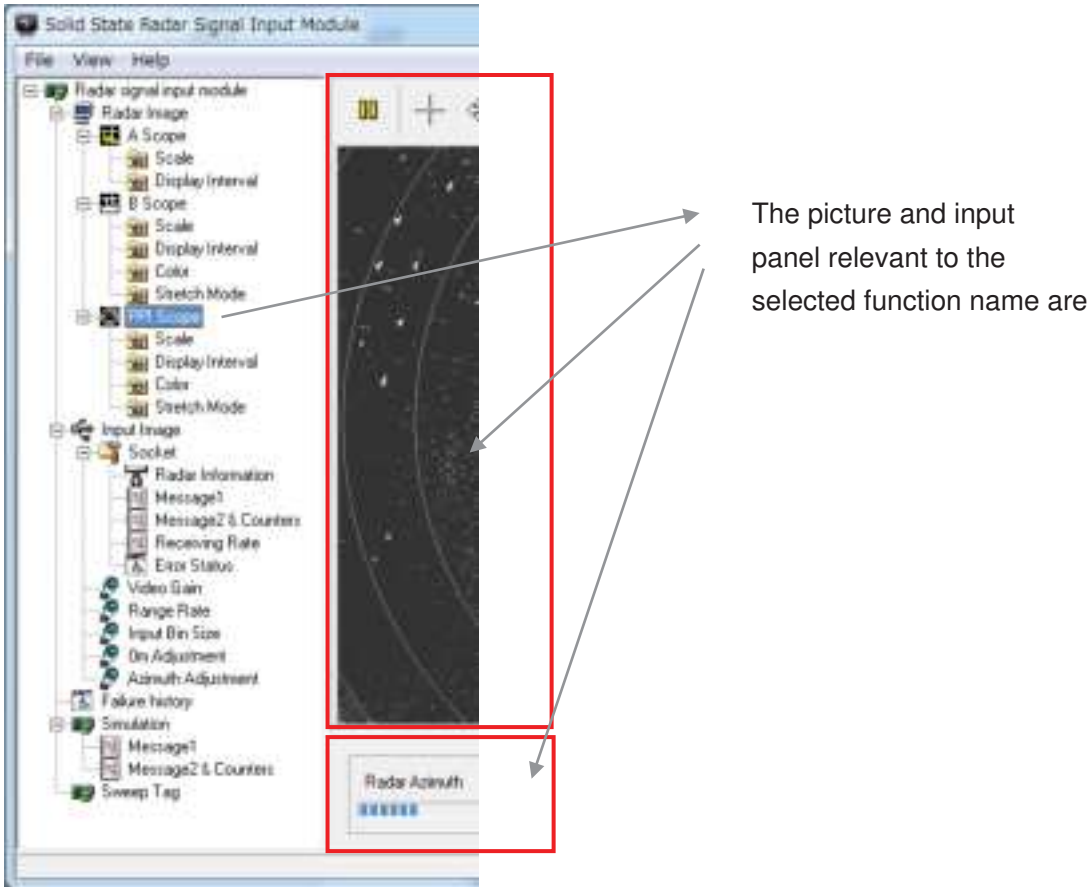


Other applications and the state of InterProcess communication are displayed.

2.4.3.3 Help

(1) Version

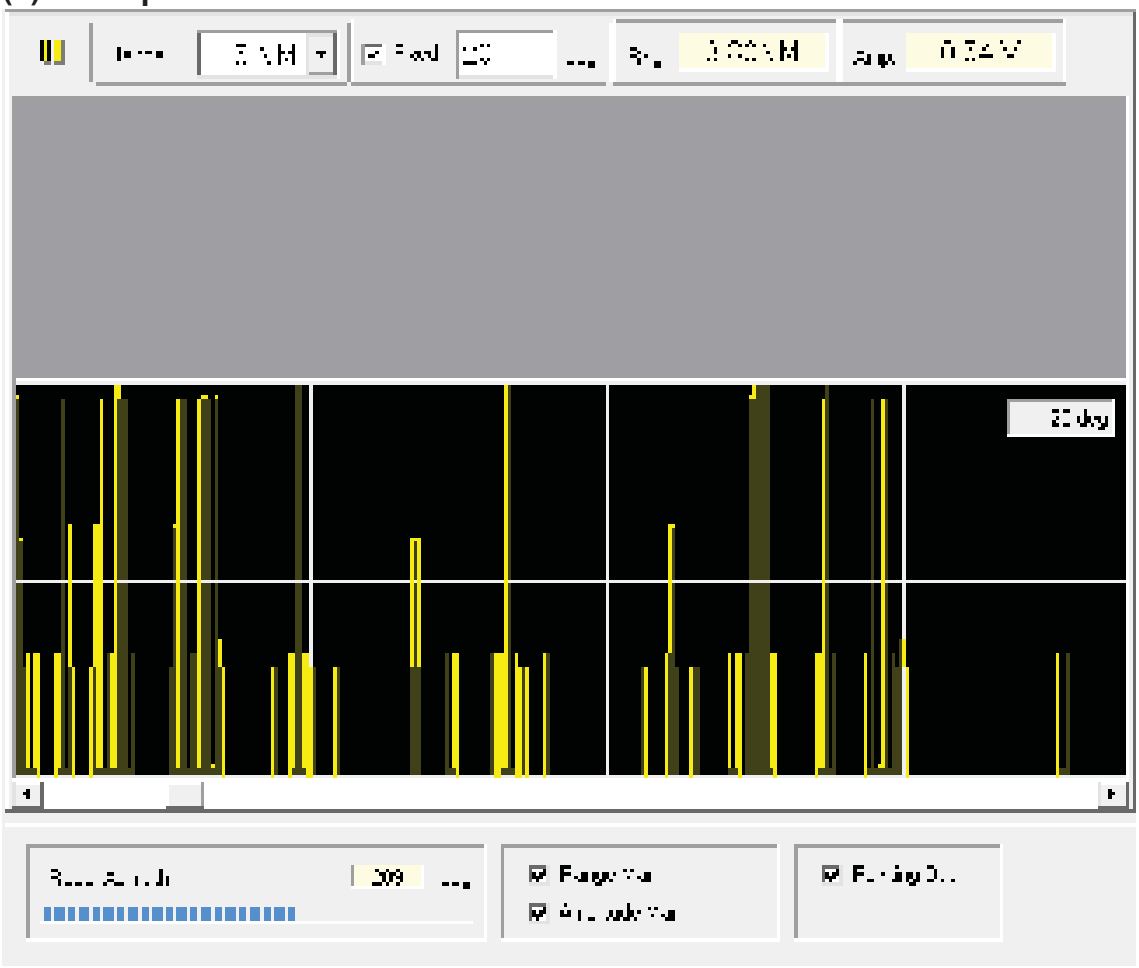
2.4.4 Tree Menu and Functional Description



A function name is displayed in tree form. When a function name is selected, a related picture and a related input panel are displayed.

2.4.4.1 Radar Image

(1) A Scope



: Image update is stopped when this switch turned ON.

Range: Selects radar display range.

0.5 NM, 0.75 NM, 1.5 NM, 3 NM, 6 NM, 12 NM, 24 NM, 48 NM, 96 NM, 192 NM,

Fixed: Fixed the display azimuth.

Rng.: Displays distance of cursor position.

Amp.: Displays echo level(amplitude) of the cursor position (reference value).

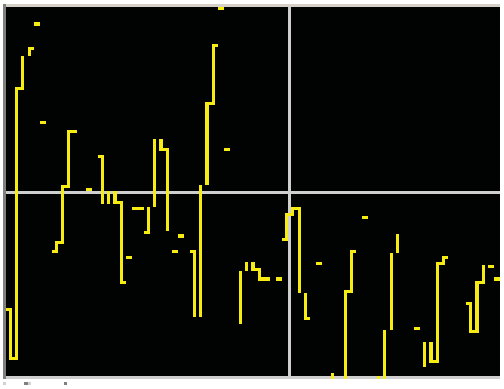
Input Panel

Radar Azimuth: Displays the radar antenna azimuth angle.

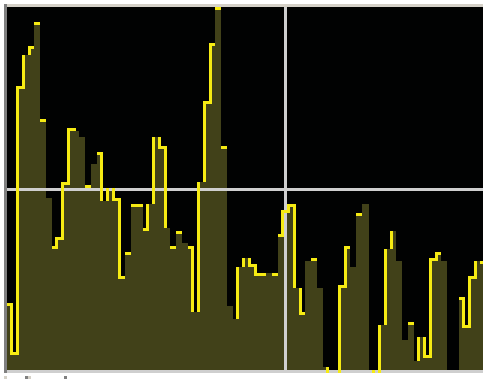
Range Mark: Selects display on/off of the Range Marker.

Amplitude Mark: Selects display on/off of the amplitude marker.

Paint Out: : Selects painting out on/off.



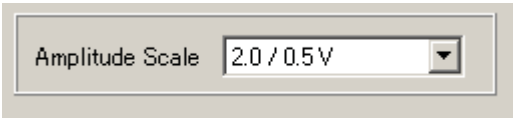
Painting out off



Painting out on

(Please select according to CPU load)

1) Scale

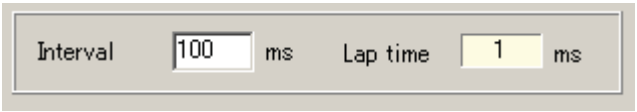


Amplitude Scale: Selects amplitude scale.(Scale/Marker Interval)

- 0.5 / 0.1 V
- 1.0 / 0.2 V
- 2.0 / 0.5 V
- 5.0 / 1.0 V

(Amplitude(level) is reference value).

2) Display Interval

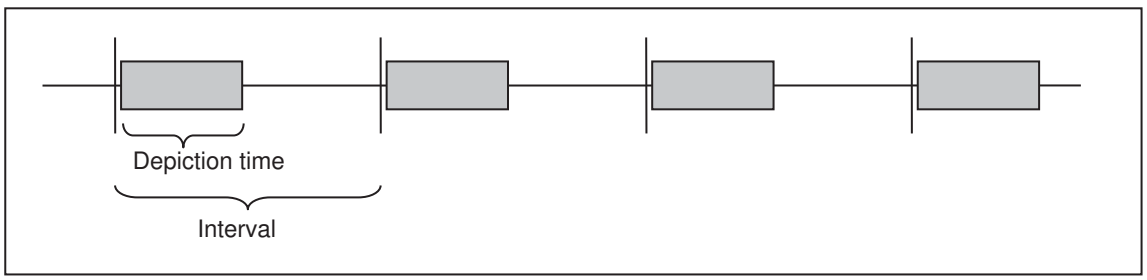


Interval: Presets the update interval of radar picture. (Preset range:10～1000mS)

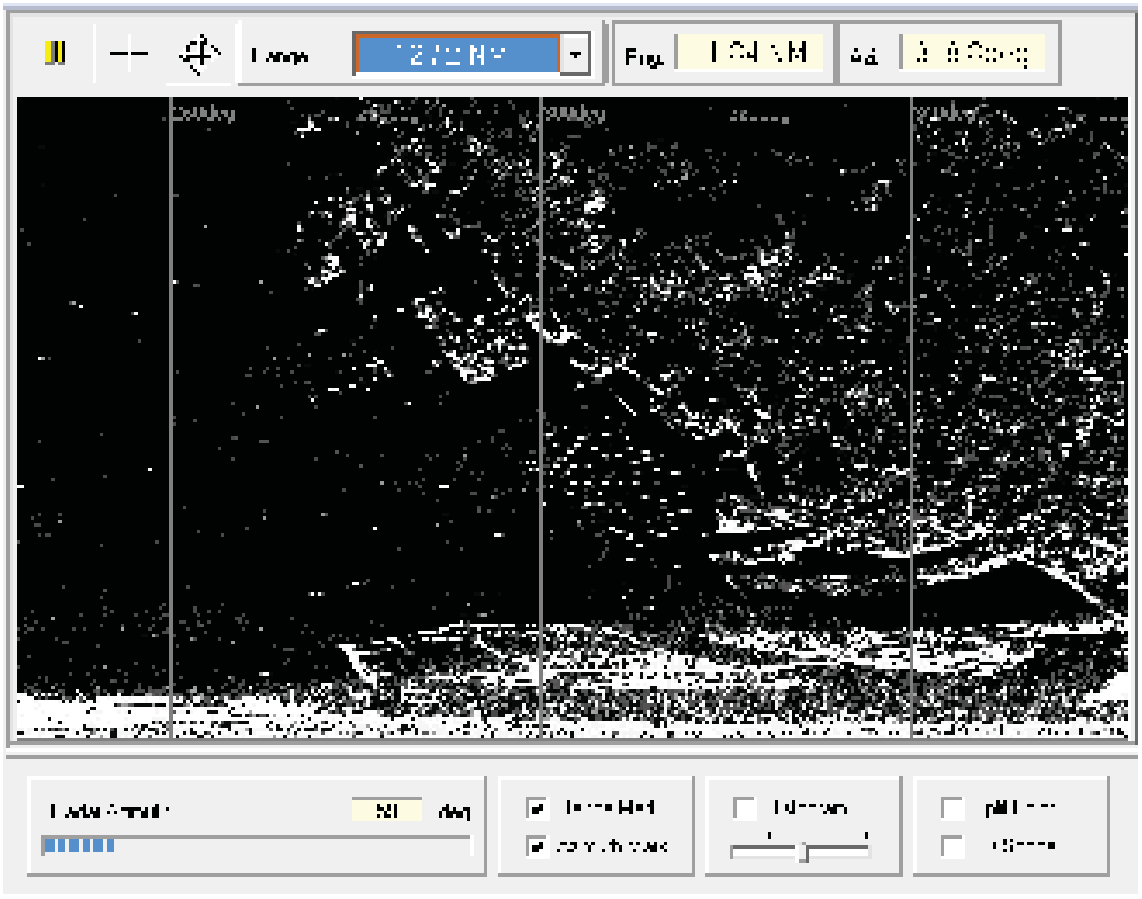
Lap time: Displays the radar picture depiction lap time.

If an updating cycle is shortened, the load of CPU will increase.

(Please preset according to CPU load)



(2) B-Scope



: Image update is stopped when this switch turned ON.

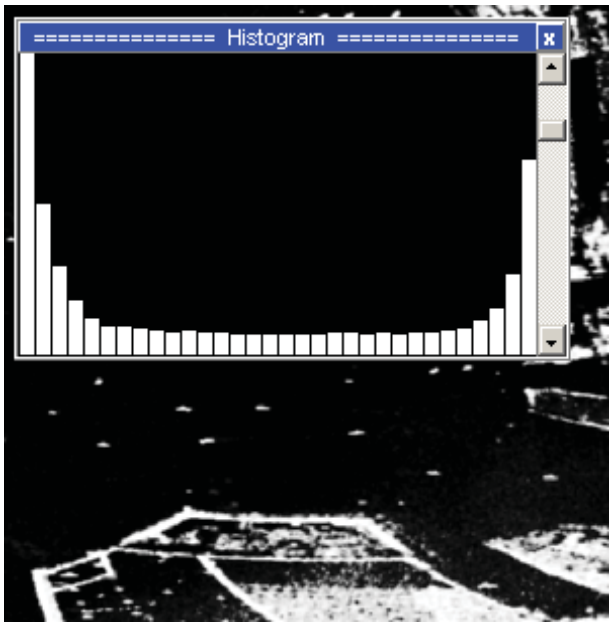
: Shows cursor position in the picture.

: Moves picture position.

Range: Selects radar display range.
Rng.: Displays distance of cursor position.
Azi.: Displays azimuth angle of cursor position.

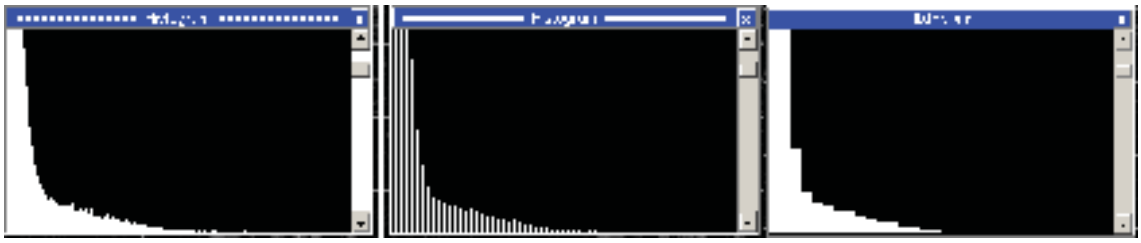
Input Panel

Radar Azimuth : Displays the radar antenna azimuth angle.
Range Mark : Selects display on/off of the Range Marker.
Azimuth Mark : Selects display on/off of the azimuth marker.
Histogram : Selects display on/off of the histogram.



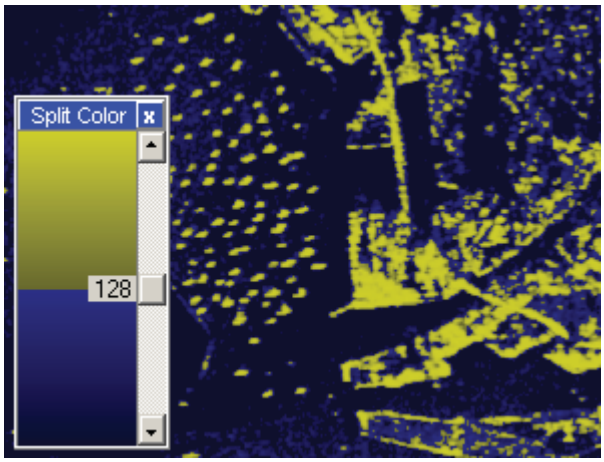
: Selects the histogram section width.

1 x 256, 4 x 64, 8 x 32, 16 x 16, 32 x 8

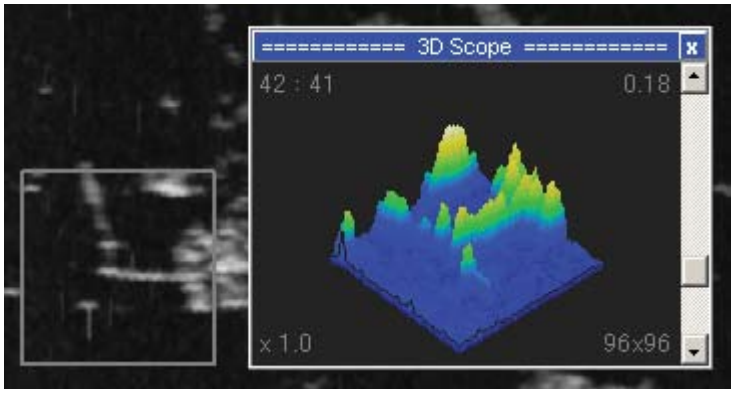


1 x 256 4 x 64 8 x 32

Split Color: Display on/off of the function to classify a radar picture by color to two gradation is changed.



3D Scope：Selects the 3D display on/off.

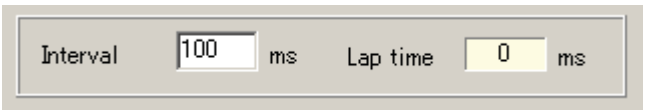


1) Scale

Azimuth Scale: Selects azimuth scale. (Scale/Marker interval)

- 30 / 5 deg
- 60 / 10 deg
- 90 / 15 deg
- 120 / 20 deg
- 180 / 30 deg
- 270 / 45 deg
- 360 / 60 deg

2) Display Interval

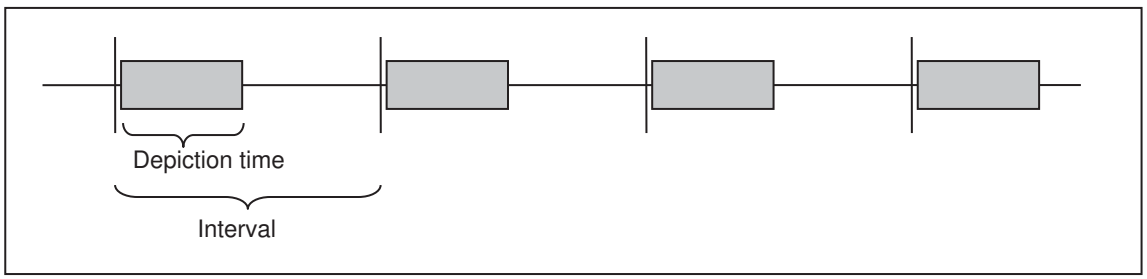


Interval: Presets the update interval of radar picture. (Preset range:10～1000mS)

Lap time: Displays the radar picture depiction lap time.

If an updating cycle is shortened, the load of CPU will increase.

(Please preset according to CPU load)

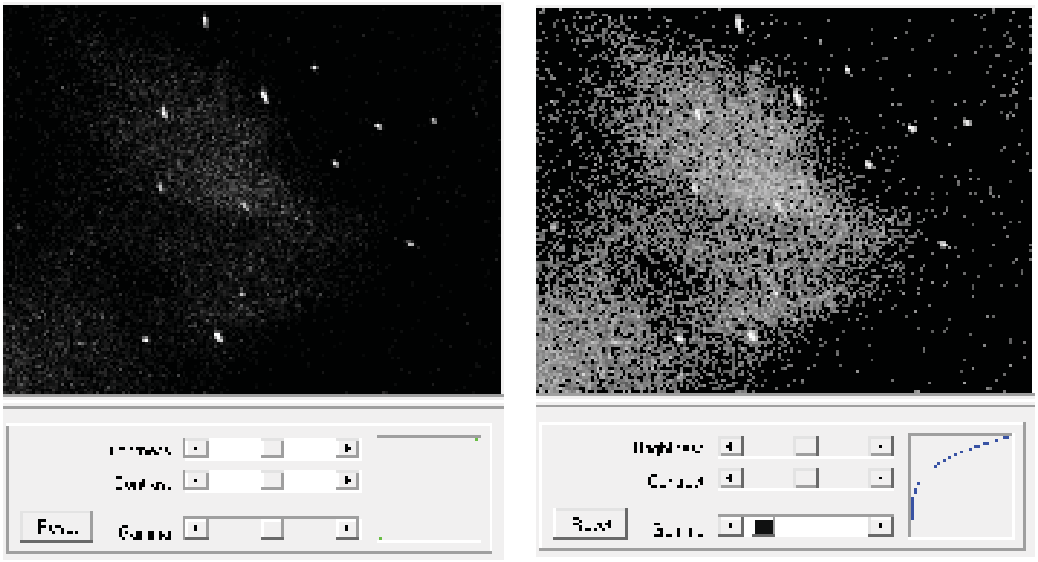


3) Color

White Button: Sets the radar picture display color to white monochrome.
Green Button: Sets the radar picture display color to green monochrome.
Yellow Button: Sets the radar picture display color to yellow monochrome.

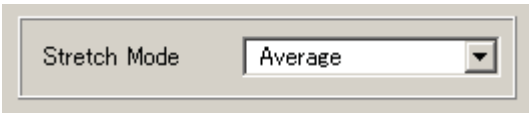
Red Slide Bar: Adjusts the red level of radar picture color.
Green Slide Bar: Adjusts the green level of radar picture color.
Blue Slide Bar: Adjusts the blue level of radar picture color.

Reset Button: Resets the gradation curvature.
Brightness Scroll Bar: Adjusts the brightness of gradation curvature.
Contrast Scroll Bar: Adjusts the contrast of gradation curvature.
Gamma Scroll Bar: Adjusts the gamma level of gradation curvature.



Example of Adjusting of gamma level

4) Stretch Mode



Stretch Mode: Selects the pixel composite method for B-scope conversion.

- None : Pixel composition is not carried out.
- Peak Hold :Maximum value is used.
- Average : Average value is used.

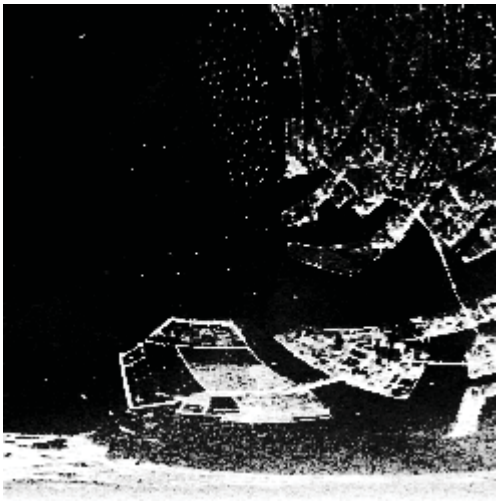
・Minimum : Minimum value is used.

None

Peak Hold

Average

Minimum



(3) PPI Scope

 : Image update is stopped when this switch turned ON.

 : Shows cursor position in the picture.

 : Moves picture position. (Off-Center)

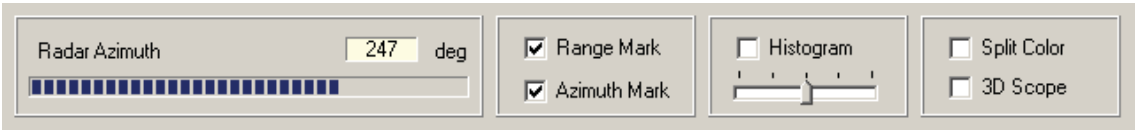
 :Expand the position of cursor. (Zoom-in)

 : Reduce the position of cursor. (Zoom-out)

 : Shows display range and range marker interval.

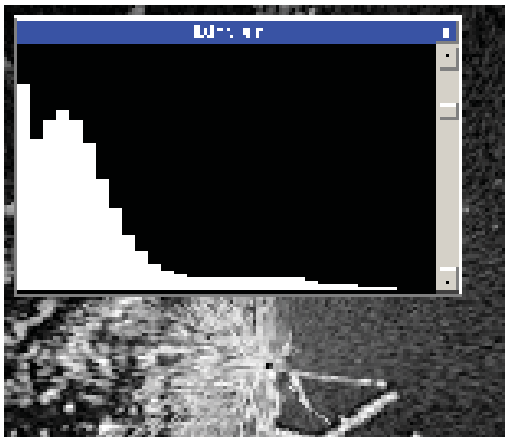
Rng. : Displays distance of cursor position.
Azi. : Displays azimuth angle of cursor position.

Input Panel



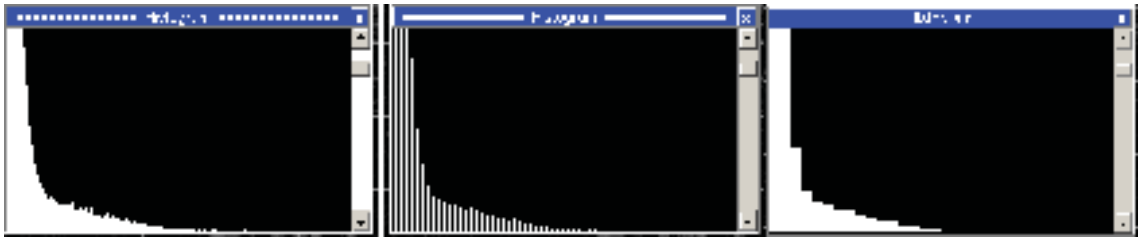
Radar Azimuth : Displays the radar antenna azimuth angle.
Range Mark : Selects display on/off of the Range Marker.
Azimuth Mark : Selects display on/off of the azimuth marker.

Histogram : Selects display on/off of the histogram.



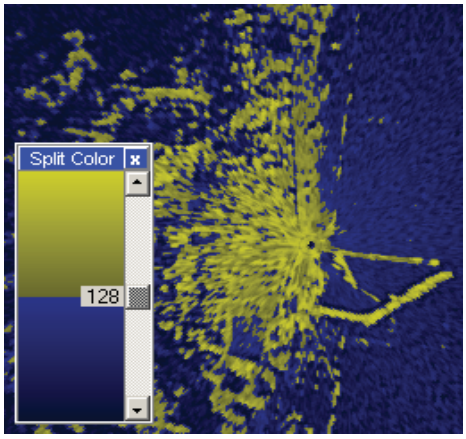
: Selects the histogram section width.

1 x 256, 4 x 64, 8 x 32, 16 x 16, 32 x 8

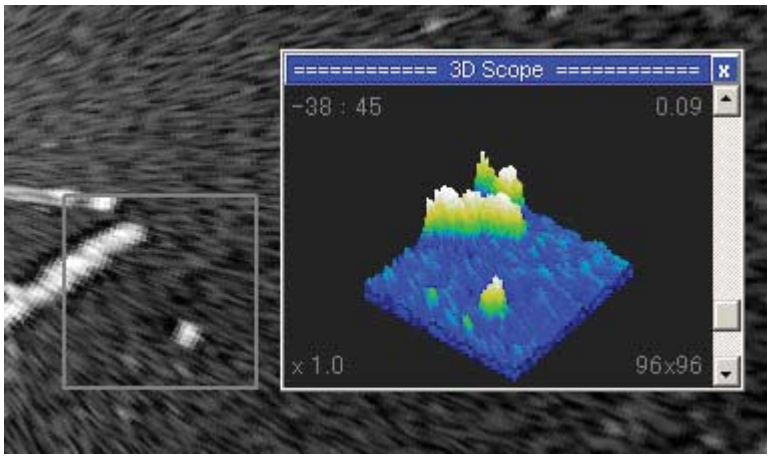


1 x 256 4 x 64 8 x 32

Split Color: Display on/off of the function to classify a radar picture by color to two gradation is changed.



3D Scope：Selects the 3D display on/off.

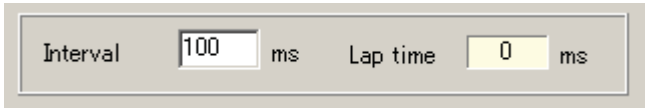


1) Scale

Range: Selects the display range scale. (Range/Range Marker Interval)

- 0.25 / 0.05 NM
- 0.5 / 0.1 NM
- 1 / 0.2 NM
- 2 / 0.5 NM
- 4 / 1 NM
- 8 / 2 NM
- 16 / 5 NM
- 32 / 10 NM
- 64 / 20 NM
- 128 / 50 NM

2) Display Interval

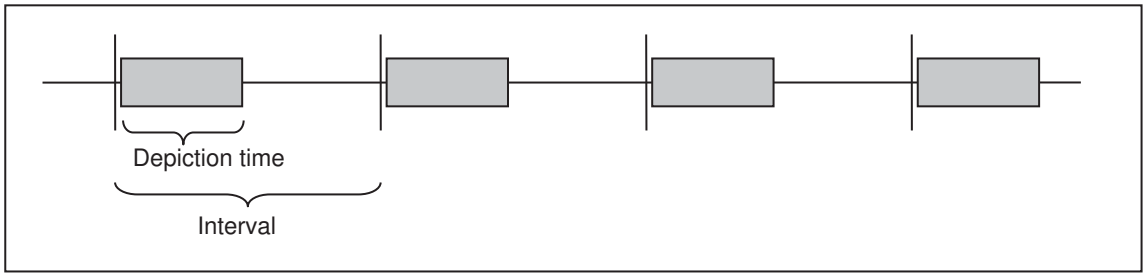


Interval: Presets the update interval of radar picture. (Preset range:10～1000mS)

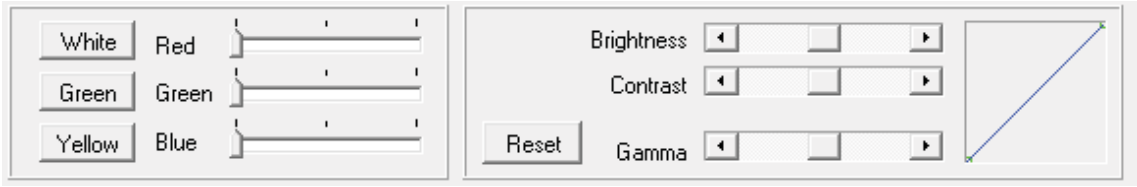
Lap time: Displays the radar picture depiction lap time.

If an updating cycle is shortened, the load of CPU will increase.

(Please preset according to CPU load)



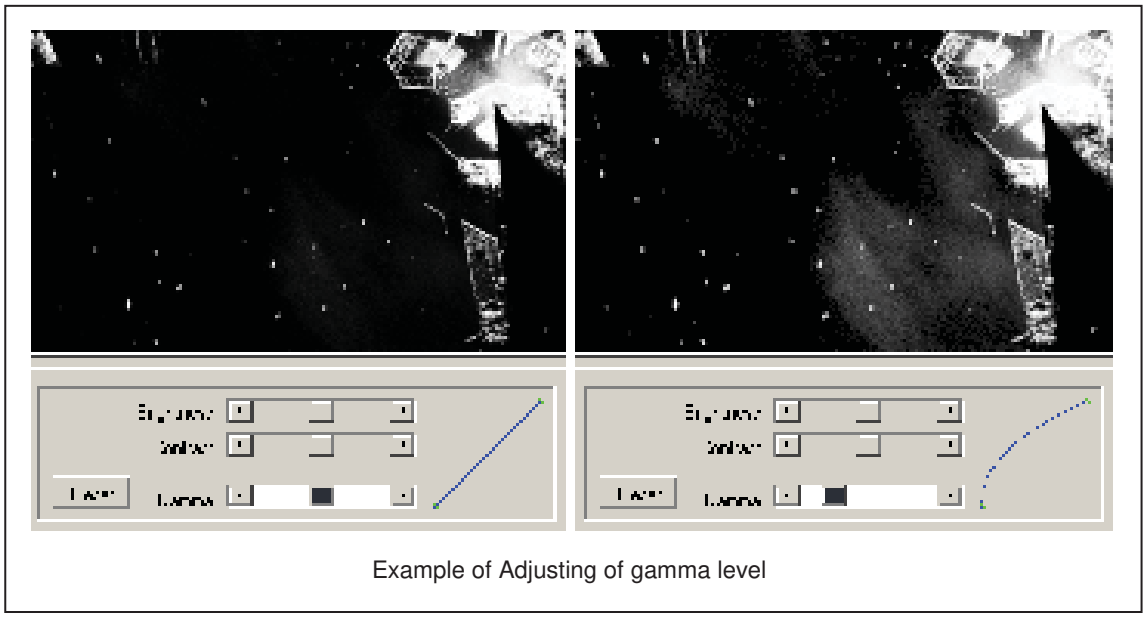
3) Color



White Button: Sets the radar picture display color to white monochrome.
Green Button: Sets the radar picture display color to green monochrome.
Yellow Button: Sets the radar picture display color to yellow monochrome.

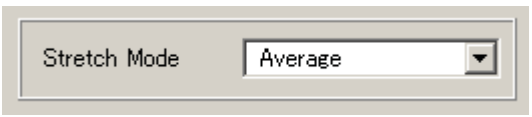
Red Slide Bar: Adjusts the red level of radar picture color.
Green Slide Bar: Adjusts the green level of radar picture color.
Blue Slide Bar: Adjusts the blue level of radar picture color.

Reset Button: Resets the gradation curvature.
Brightness Scroll Bar: Adjusts the brightness of gradation curvature.
Contrast Scroll Bar: Adjusts the contrast of gradation curvature.
Gamma Scroll Bar: Adjusts the gamma level of gradation curvature.



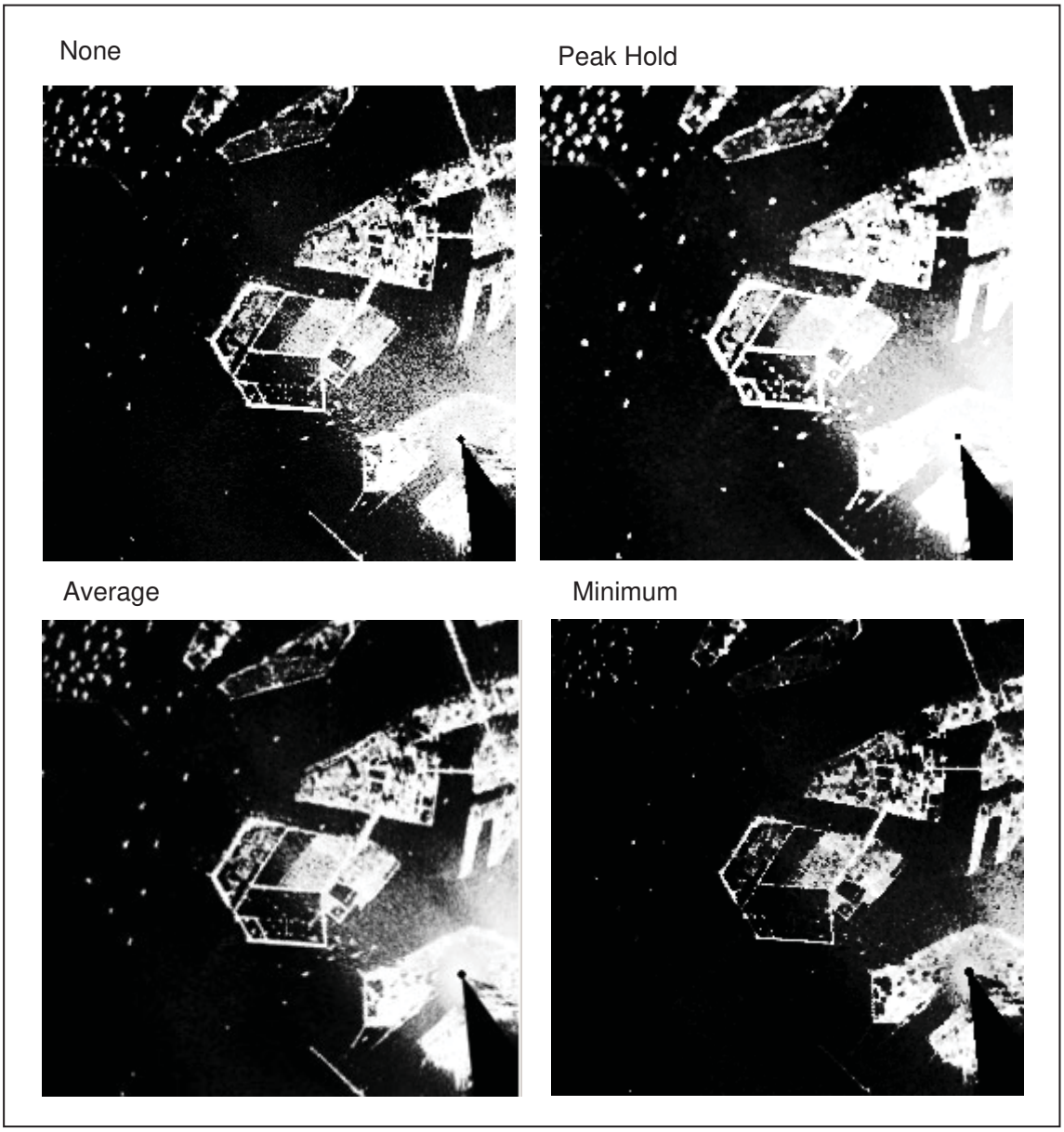
Example of Adjusting of gamma level

4) Stretch Mode



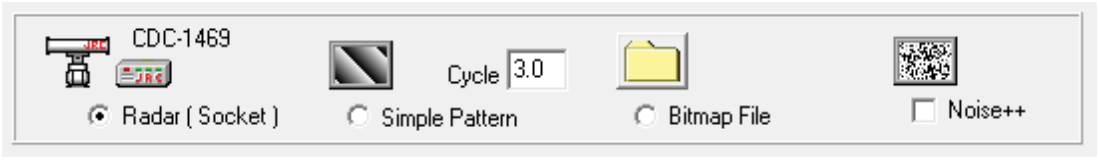
Stretch Mode: Selects the pixel composite method for B-scope conversion.

- None : Pixel composition is not carried out.
- Peak Hold :Maximum value is used.
- Average : Average value is used.
- Minimum : Minimum value is used.



2.4.4.2 Input Image

Selectes the input source



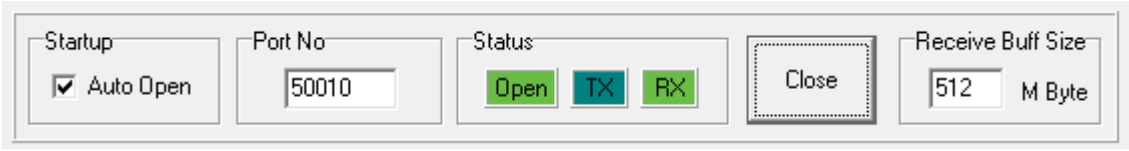
Radar (Socket) : Selects radar signal.
Simple Pattern : Selects the Test Pattern.
Cycle: Presets the test pattern rotation speed.
Bitmap File: Makes the bitmap file.

 : Selects the bitmap file.

Noise++ : Superimpose the noise signal. (This setup is not saved.)

(1) Socket

The TCP/IP UDP client socket for connecting with radar signal processing equipment (CDC-1469) on NTG-560 SSTRX is set up.



Startup – Auto Open: Automatically sets the socket to the application startup in the case to be open.
Port No: Presets the receiving port number of UDP socket.
Status : Status of UDP socket.

: Close

: Open

: Ready for Transmission

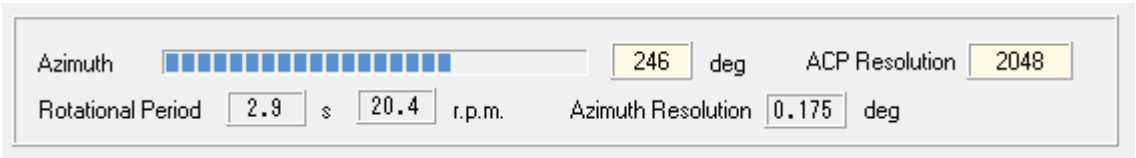
: Under transmission

: Waiting the receiving

: Under receiving

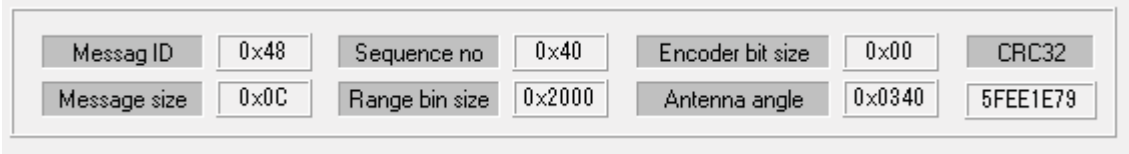
Open(or Close) Button : Open (or close) the socket
Receive Buff Size : Presets the receiving buffer size. (1 - 512MB)

1) Radar Information



Azimuth : Displays radar antenna azimuth angle. (Latest sweep message angle)
ACP Resolution : Displays ACP resolution.
Rotational Period : Displays Antenna revolution period and rotation speed(rpm).
Azimuth Resolution]: Displays azimuth resolution. (The value which divided 360 degrees by the number of sweeps)

2) Message1

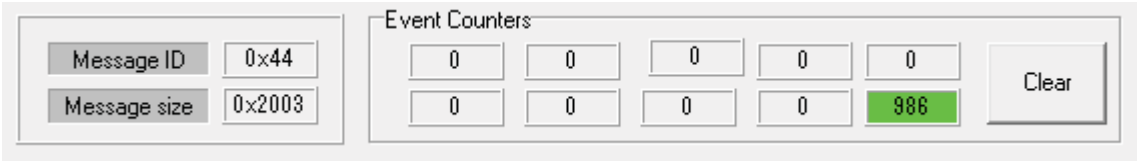


Display the header information of the receiving message.

Format of Receiving Message

Type	Size	Description
Header	12 bytes	Message ID (0x48) Message size(12) Sequence Number(0 – 255) **Range bin size** Antenna encoder bit number(0x00:11,0x01:12) Antenna Angle information CRC32c
Sweep data	**Range bin size** +3bytes	Message ID (0 x 44) Message size(Range bin size + 3) Data (Echo strength data)

3) Message2 & Counters



Message ID :Displays the message ID of sweep data (0 x 44).

Message Size :Displays the message size of sweep data.

*Message size = Range bin size+3.

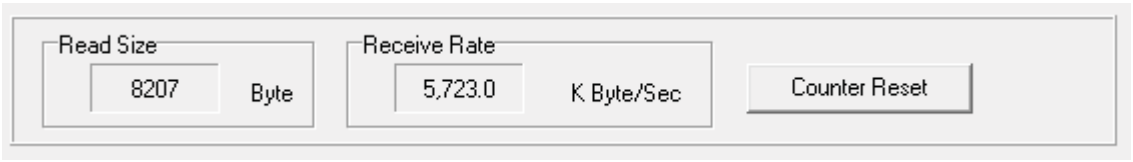
Event Counters :Displays event counters of sweep message receiving process.

Contents of event counters

Location	Outline	Detailed
Upper1	It is interrupted 2 seconds or more during message reception.	If received during the reception of the message is interrupted for two seconds, and discard the message received up to the middle of its sweep. The number of times.
Upper2	Sequence number error	Number of times that the header sequence number is not correctly incremented.
Upper3	Azimuth error(skipping)	Number of times that the angle is open more than once of the orientation information in the header.
Upper4	Invalid data before Header	In a state of waiting for reception of the header, bytes on read-and-discard mode of data that is not recognized as a header.
Upper5	Split receiving of header	In a state of waiting for reception of the header, the header is received over a plurality of reception processing. The number of times.
Lower1	Sweep data ID error	In a state of waiting for the reception of the sweep data, the number of bytes on read-and-discard mode when the message ID is not detected.
Lower2	Mismatching of sweep data range bin number 1	Indicates the number of times the number of data of the range bins number and sweep data of the header do not match.
Lower3	Mismatching of sweep data range bin number 2	Always 0. The counter to be detected above is always 0.
Lower4	Occurrence of exception during sweep data receiving	Always 0. (Referred to debugging)

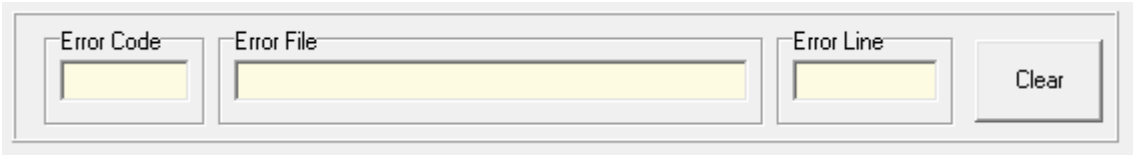
Lower5	Sweep number	Shows maximum sweep number in receved data at 1 time receving by appilication. Indication of whether it is processed smoothly.

4) Receiving Rate



Read Size: : Display the maximum of the data size processed by one reception processing.
Receive Rate: Display the maximum of the receiving data size per second.
Counter Reset Button: Clear the maximum value of both Read Size and Receive Rate.

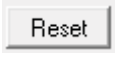
5) Error Status



It will display an error of application definition that occurred during the receiving process.
Error Code: Display the error number.
Error File: Display the error of occurred location (source file name).
Error Line: : Display the places that have occurred error (line number on the source file).
Clear Button: Clear the error display.

(2) Video Gain

Video Gain Scroll Bar: Adjust the radar video gain. (-1.00～+1.00)

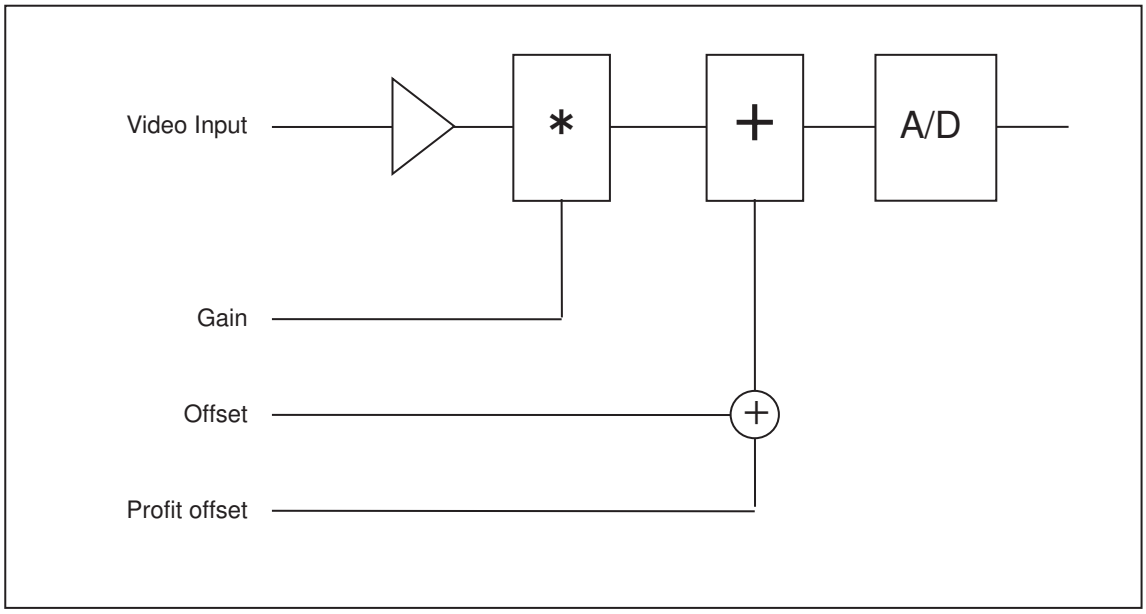


: Reset the Video Gain to default value. (+1.00)

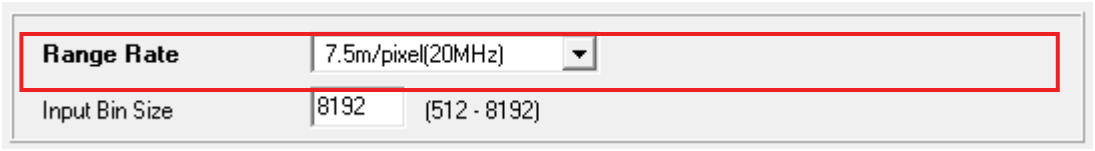
Video Offset Scroll Bar: Adjust the offset voltage of radar video. (-1.00～+1.00)

: Reset the Video Offset to default value. (0.00)

Profit Offset: Gain offset. This value is controlled by other module.



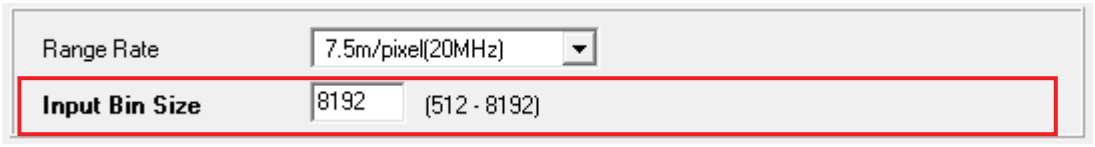
(3) RangeRate



Range Rate: Select the Range Rate (Resolution)

0 - 7.5m/pixel (20MHz)
1 - 15m/pixel (10MHz)
2 - 22.5m/pixel
3 - 30m/pixel (5MHz)
4 - 37.5m/pixel
5 - 45m/pixel
6 - 52.5m/pixel
7 - 60m/pixel (2.5MHz)
8 - 67.5m/pixel
9 - 75m/pixel (2MHz)
10 - 82.5m/pixel
11 - 90m/pixel
12 - 97.5m/pixel
13 - 105m/pixel
14 - 112.5m/pixel
15 - 120m/pixel (1.25MHz)

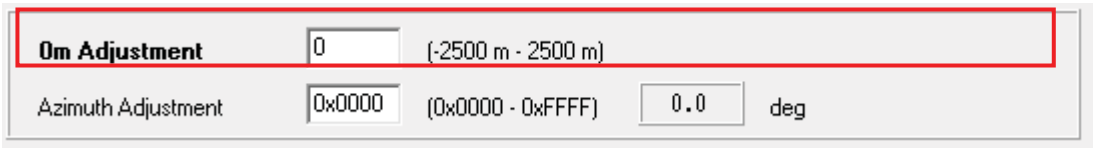
(4) Input Bin Size



Input Bin Size: Specify the input range bin size. (512 – 8192)

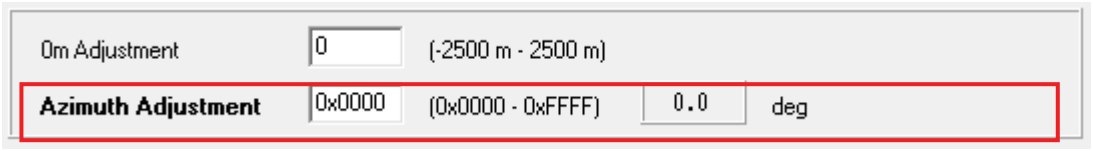
*By shortening the capture range bin size(length), you can reduce the CPU load.

(5) 0m Adjustment



0m Adjustment: Adjust the radar echo start range bin. (-2500m - +2500m)）
This adjustment is for adjusting the center of the radar image and shift the radar image on the home side in pixels.

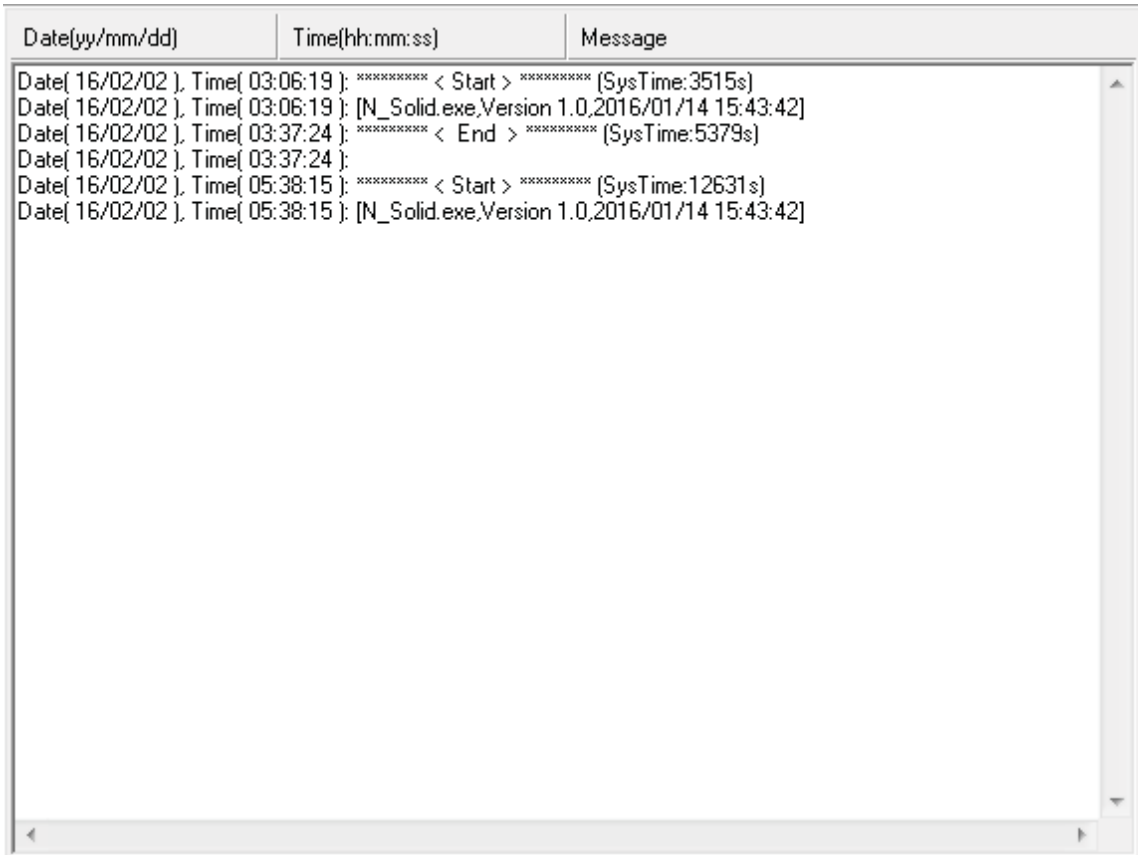
(6) Azimuth Adjustment



Azimuth Adjustment: Adjust the radar azimuth angle. (0x0000 - 0xFFFF)
This is for radar echo azimuth angle. Resolution is 360/65536(deg.)

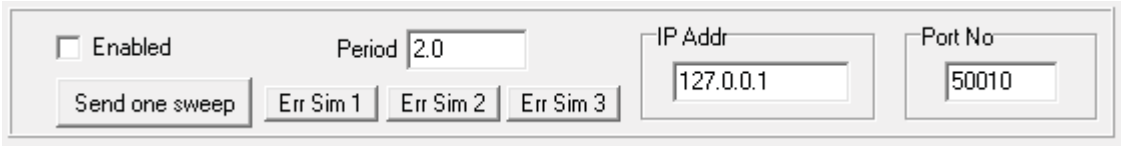
2.4.4.3 Failure history

Failure history will be displayed for the troubleshooting.



Update Button: Update the current logging information.
All Clear Button: Clear the all logging information.
Save to file Button: Save the current logging data with file name.

2.4.4.4 Simulation

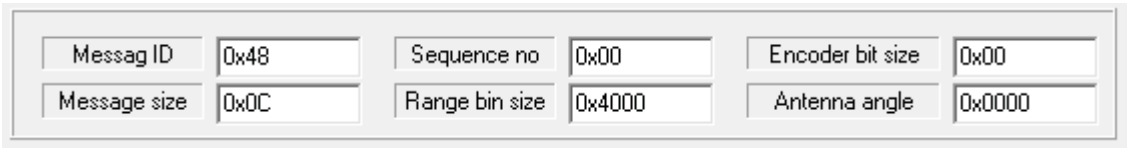


This function is to simulate the output of the message of the CDC-1469. It can not use that it has not Open the receiving socket so to send will use the socket for reception.

Enabled: This is switch for simulation on/off.
Period: Specify the radar antenna rotation speed for the simulation.
IP Addr: Specify the output IP address. (127.0.0.1 is special IP which mean own IP address)
Port No: Specify the output port number.
Send one sweep Button: Outputs the message of one sweep data as single.
Outputs the whether Enabled check box is off.

Err Sim 1 Button: Outputs the CRC32C of header with taking small interval.
Err Sim 2 Button: Outputs any of the data before header.
Err Sim 3 Button: Lack the message of 1 sweep length.
*These functions are for communication confirmation and debugging.

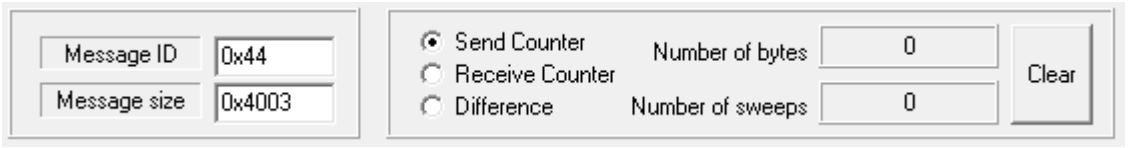
(1) Message1



Specify the header information of simulated sweep message.

Type	Size	Description
Header	12 bytes	Message ID (0x48) Message size(12) Sequence Number(0 – 255) **Range bin size** Antenna encoder bit number(0x00:11,0x01:12) Antenna Angle information CRC32c
Sweep Data	**Range bin size** + 3 bytes	Message ID (0 x 44) Message size(Range bin size + 3) Data (Echo strength data)

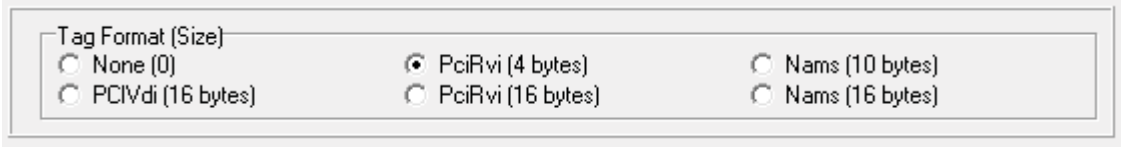
(2) Message2 & Counters



Message ID : Specify the message ID of simulated sweep data (0 x 44).
Message Size : Specify the message size od simulated sweep data.
*Message size = Range bin size+3.

Send Counter : Select the both sending data counter and sweep counter.
Receive Counter: Select the both receiving data counter and sweep counter.
Difference :Select the different. (Send Counter) – (Receive Counter)
Number of bytes: Display the data counter.
Number of sweeps: Display the sweep counter.
Clear Button: Clear the above counter.

2.4.4.5 Sweep Tag



Tag Format (Size):

None(0): No hardware Tag.

Range bin	Description	Remarks
4080～4095	Padding data 16bytes	0 Fixed
3～4079	Radar picture data 3 - 4079	Valid
2	Radar picture data 2	Valid
1	Radar picture data 1	Valid
0	Radar picture data 0	Valid

PciVdo(16): Pci – Vdi format

Range bin	Description	Remarks
16～4095	Radar picture data 0 - 4079	Valid
15	Command register H	0 Fixed
14	Command register L	0 Fixed
13	End distance H	Valid
12	End distance L	Valid
11	Start distance H	0 Fixed
10	Start distance L	0 Fixed
9	Times of day H	0 Fixed
8	Times of day L	0 Fixed
7	Dummy	uncertainty
6	PPS counter value H	0 Fixed
5	PPS counter value M	0 Fixed
4	PPS canter value L	0 Fixed
3	External Tag H	0 Fixed
2	External Tag L	0 Fixed
1	Radar antenna azimuth H [65536 / 360]	Valid
0	Radar antenna azimuth L [65536 / 360]	Valid

PciRvi(4) : Pci – Rvi format

Range bin	Description	Remarks
4084～4095	Padding data 12 bytes	0 Fixed
4～4083	Radar picture data 0 - 4079	Valid
3	External Tag H	0 Fixed
2	External Tag L	0 Fixed
1	Radar antenna azimuth H [65536 / 360]	Valid
0	Radar antenna azimuth L [65536 / 360]	Valid

PciRvi(16): Pci – Rvi format + 12 bytes padding

Range bin	Description	Remarks
16～4095	Radar picture data 0 - 4079	Valid
4～15	Padding data 12bytes	0 Fixed
3	External Tag H	0 Fixed
2	External Tag L	0 Fixed
1	Radar antenna azimuth H [65536 / 360]	Valid
0	Radar antenna azimuth L [65536 / 360]	Valid

Nams(10): Nams format

Range bin	Description	Remarks
4090～4095	Padding data 6bytes (=0)	0 Fixed
10～4089	Radar picture data 0 - 4079	Valid
9	End distance H	Valid
8	End distance L	Valid
7	Start distance H	0 Fixed
6	Start distance L	0 Fixed
5	Radar antenna azimuth H [65536 / 360]	Valid
4	Radar antenna azimuth L [65536 / 360]	Valid
3	PPS times of day H	0 Fixed
2	PPS times of day MH	0 Fixed
1	PPS times of day ML	0 Fixed
0	PPS times of day L	0 Fixed

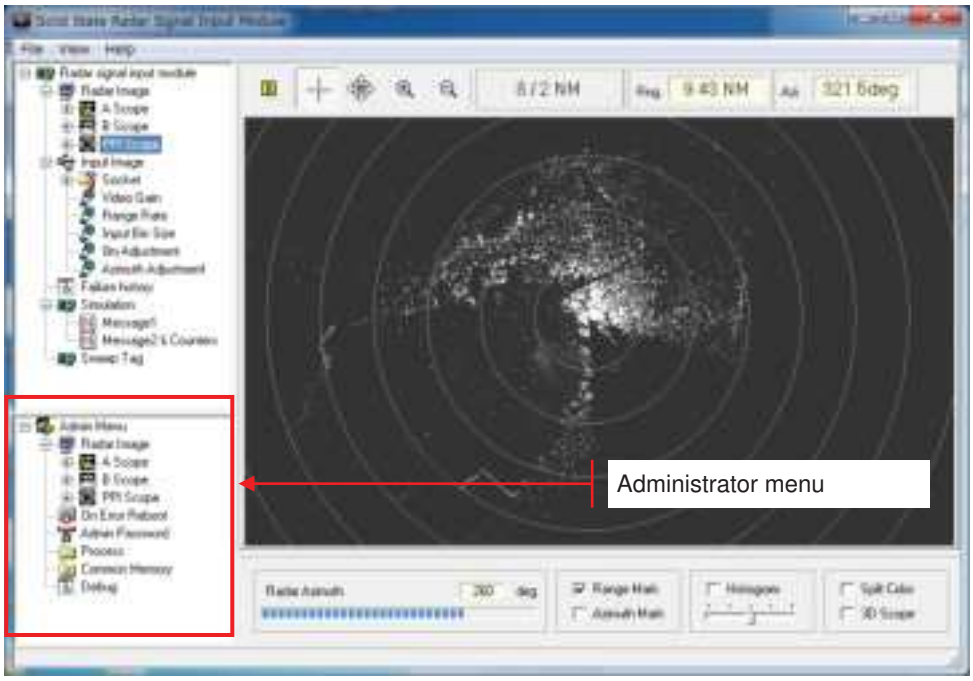
Nams(16): Nams format + 6bytes padding

Range bin	Description	Remarks
16～4095	Radar picture data 0 - 4079	Valid
10～15	Padding data 6bytes	0 Fixed
9	End distance H	Valid
8	End distance L	Valid
7	Start distance H	0 Fixed
6	Start distance L	0 Fixed
5	Radar antenna azimuth H [65536 / 360]	Valid
4	Radar antenna azimuth L [65536 / 360]	Valid
3	PPS times of day H	0 Fixed
2	PPS times of day MH	0 Fixed
1	PPS times of day ML	0 Fixed
0	PPS times of day L	0 Fixed

2.5.5 Admin Menu

This menu is a summary of the settings to be performed when the system is introduced. This is not used in normal. To display this menu, complete the following steps.

i. Click the File of main menu with pushing the Ctrl key.
ii. Select the Admin Menu of Menu.
iii. Push the OK button after input the password.
(Initial password: “Admin”)



2.5.5.1 Radar Image

(1) A Scope

It is an item holder for the A Scope display.

1) Double Buffered

Double Buffered: In case a radar picture is updated, it carries out through a buffer. Flicker when moving the image will be reduced by this function.

(2) B Scope

It is an item holder for the B Scope display.

1) Double Buffered

Double Buffered: In case a radar picture is updated, it carries out through a buffer.
Flicker when moving the image will be reduced by this function.

(3) Ppi Scope

It is an item holder for the Ppi Scope display.

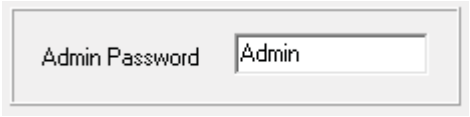
1) Double Buffered

Double Buffered: In case a radar picture is updated, it carries out through a buffer.
Flicker when moving the image will be reduced by this function.

2.5.5.2 On Error Reboot

If reboots, when an error occurs: Reboots the PC at error occurrence.
Forced reboot: Reboots immediately. (Test use)

2.5.5.3 Admin Password



Admin Password: Set the password to enter to display the Administrator menu.

2.5.5.4 Process

Process Priority: Select the application process priority.

0 – Real time	High priority
1 – High	↑
2 – Above Normal	
3 – Normal	
4 – Below Normal	↓
5 – Idle	Low priority

Thread Priority: Select the priority of the application's main thread.

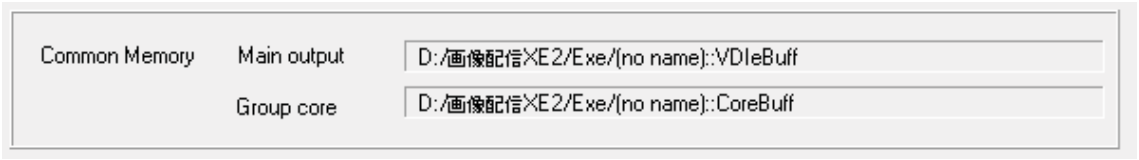
0 – Time Critical	High priority
1 – Highest	↑
2 – Above Normal	

3 – Normal
4 – Below Normal
5 – Lowest ↓
6 – Idle Low priority

CPU Select: (Not using)

2.5.5.5 Common Memory

It is an interface for providing other applications with a radar picture.



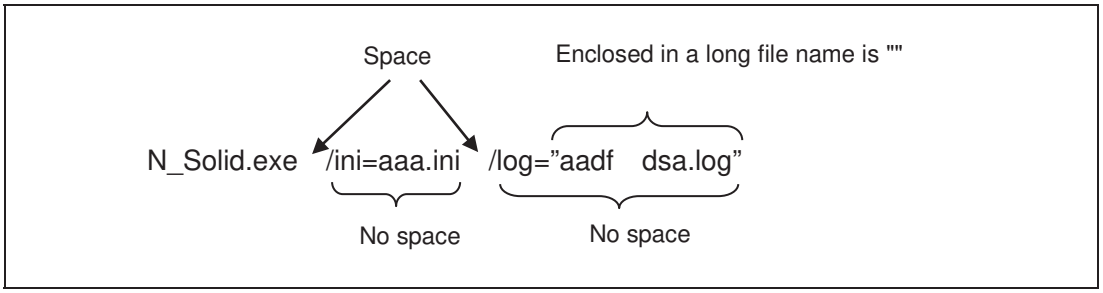
Main output: Output for shared memory name to the image processing module.
Group core: Shared memory name for the final output.

2.5.5.6. Debug

For debugging (No discloser)

2.6 Startup parameter

The format of the command line parameters



The following control is possible by the command line parameter.

Command Line Parameter	Description
/ini=(Initialization file name)	Specify the initialization file. The default is to N_Solid.ini of module directory.
/log=(Failure log file name)	Specify the failure log file name. The default is to N_Solid.log of module directory.
/name=(Instance distinguished name)	Specify the unique identification name to create multiple instances in the PC.
/mem=(Shared memory name)	Specify the name of the destination shared memory of the captured radar image.

3. Specification

Transmitting frequency : Non-chirp pulse 9,410MHz(P0N)
Chirp pulse 9,440 ± 15MHz(Q0N)
Non-Chirp/Chirp pulse(P0N/Q0N) *1
Frequency Accuracy : +/- 300ppm
Transmitting power(Peak) : 240W +1dB, -3dB (120W~300W)*2
Transmitter Type : Solid State Power Amplifier(SSPA)
Transmission pulse width : Refer to Transmission Table(1)
Pulse repetition frequency(PRF) : Refer to Transmission Table(1)

Transmission Table(1)

No.	Pulse width			PRF
	Non-chirp pulse	Chirp pulse	Non-chirp pulse /Chirp pulse	
0	0.07us	2.8us	0.07us/2.8us	2280Hz
1	0.15us	4.6us	0.15us/4.6us	2280Hz
2	0.3us	9.1us	0.3us/9.1us	2280Hz
3	0.15us	18.3us	0.15/18.3us	1280Hz
4	0.15us	28.0us	0.15us/28.0us	640Hz
5	0.3us	9.1us	0.3us/9.1us	1864Hz
6	0.6us	9.1us	0.6us/9.1us	1280Hz
7	0.07us	2.8us	0.07us/2.8us	4100Hz

Minimum Detection Signal(MDS) : -93dBm or less
A/D Sampling rate : 16bit/84MHz
Pulse compression : Provided
Video Processing function : Interference rejection, CFAR and Coherent integration
Output signal : Radar video and Trigger
Radar control/monitoring : TCP/IP communication
Power supply : DC48V ± 10%
Power consumption : Less than 130W
Dimensions : 554mm(W) x 330mm(D) x 580mm(H) (Including Mounting Plate)
Operation temperature range : -15 ~ +50ºC, Non-condensing
Relative humidity : 93% @+40ºC
Storage temperature range : -25 ~ +60ºC

*1: Transmits both P0N and Q0N at simultaneously
*2: Transmitting power is fixed.

2) Radar Control/Monitoring PC display

Hardware

PC Model : HP Z230 or equivalent/ 32 or 64bit Model
CPU : Xeon 2.8GHz or more
Memory : 4Gbyets or more

Hard Disk	: 500GB or more
NIC#1	: Gigabit (1000Mbps) Jumbo Frame more than 9014bytes
NIC#2	: Ethernet (1000Mbps/100Mbps/10Mbps)
OS	: Windows 7 Professional (32 or 64bit)

Software

Feature	: Radar Control Radar Condition Monitoring Radar Echo Display NTP Time adjustment VNC Server