



MC950CR Link Program Manual

*Note: The MC950CR Link program is for Windows Vista/XP/2000 use and is not compatible with other OS.

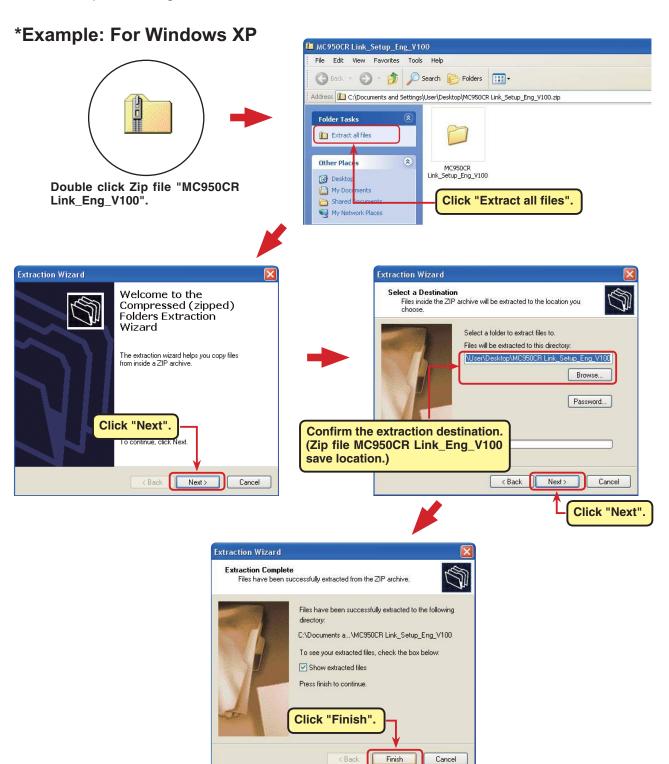
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Downloaded Zip file extraction (decompression)

The downloaded MC950CR Link_Eng_V100 file is a Zip format file. Extract (decompress) this file. (*For Windows 2000, separate decompression software is necessary.)

- **1.** With Windows Vista/XP, double click file MC950CR Link_Eng_V100 to display its contents.
- 2. Click "Extract all files". The Extraction Wizard launches.
- **3.** Extract (decompress) Zip file MC950CR Link_Eng_V100 to the same location as the Zip file storage location.



Extracted (decompressed) file confirmation

Let's confirm the extracted (decompressed) file.

- **1.** At the end of extraction (decompression), a folder named MC950C Link Setup En V100 like that shown below is created.
- **2.** Double click "MC950_Link_Setup_En_V100". The contents of the folder are displayed.



MC950C Link program installation

Before installing the MC950CR Link program, confirm that all other applications are closed. Close all virus check and other resident programs, if any.

This program needs Microsoft NET Framewowk 2.0.

If NET Framework2.0 is not installed in your computer, it is downloaded and installed from the Internet automatically.

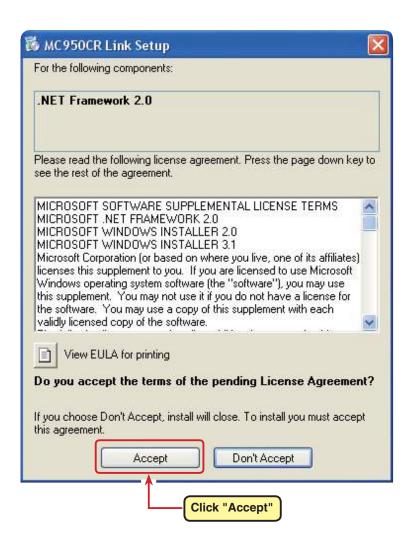
Please note: your computer must be connected to the Internet.

- **1.** Select and double click the folder named MC950CR Link Setup Eng V100 created by downloaded Zip file extraction (decompression). The contents of the folder are displayed.
- 2. Double click the EXE file named "setup".

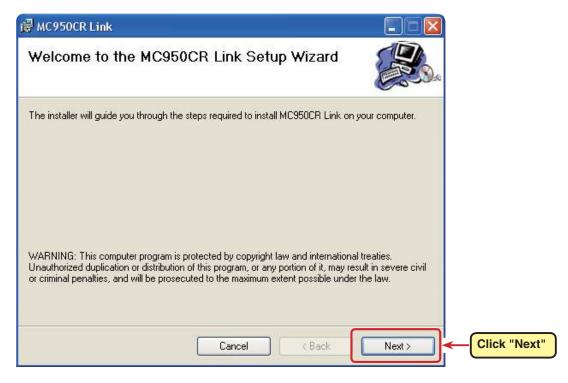


3. If "NET Frameforwk 2.0 Setup" window appears, click "Accept".

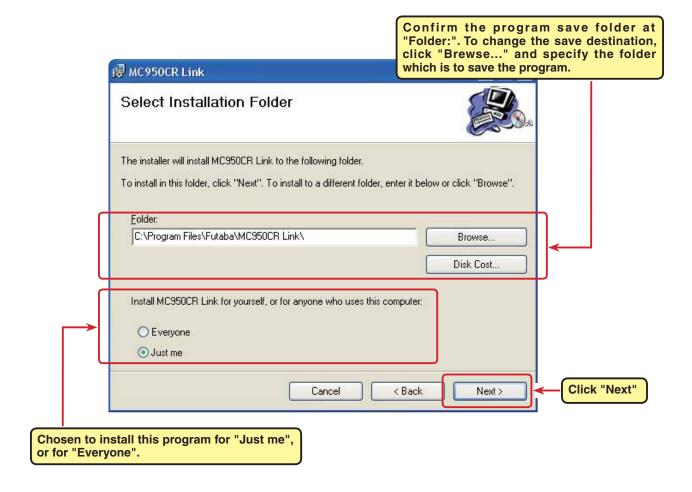
NET Frameforwk 2.0 is downloaded and installed from the Internet automatically.



4. After "Welcome the MC950CR Link Setup Wizard" window appears, click "Next".



5. Chosen to install this program for "Just me", or for "Everyone". Confirm the program folder (save destination) at "Folder:" and click "Next". To change the directory, click "Browse..." and specify the folder which is to save the program and then click "Next".

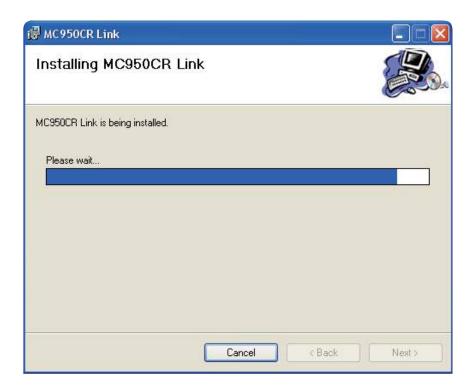


6. After "Confirm Installation" window appears, click "Next".



7. After "Install Complete" is displayed, click "Close".

The above completes MC950C R Link program installation.







MC950CR Link program startup and termination

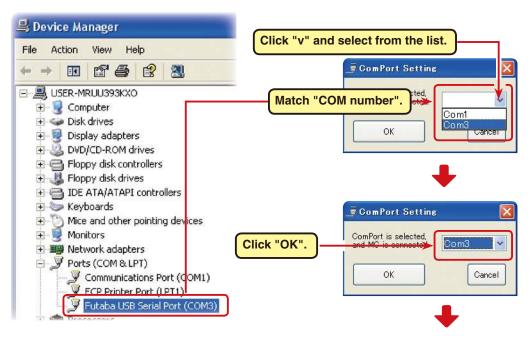
MC950CR Link program startup

- **1.** Connect your CIU-2 to the USB port of the PC.
- 2. Select desktop lower left side "Start" button "All Programs" "Futaba" "MC950CR Link", in that order. The MC950CR Link program starts up.

(The order above is for when the program group name was set to "Futaba" at installation step "5".)



3. After the program is installed, the CIU-2 COM number setting window is displayed simultaneously with the first starting. After installing the CIU-2 drivers, select the COM number confirmed by Device Manager and then click the "OK" button.

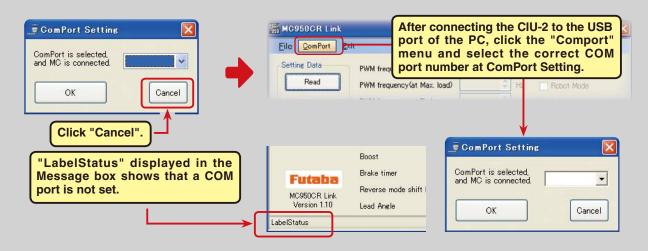


MC950CR Link At the end of COM number setting, ComPort Exit the MC950CR Link program Setting Data : Hz PWM frequency(at Min. load) startup window shown at the right Read PWM frequency(at Max. load) opens. PWM frequency at Brake Hz Dead Band Default Write Low Batt, Protection Busy = Current Limiter Log Data Current Limiter (Time Limit) Current Limit timer Brake Max. Duty Reverse Max Duty The message "ComPort was initialized" Neutral Brake appearing in the Message box shows that a COM port was set. Boost Brake timer Futaba Reverse mode shift level MC950CR Link Version 1.10 Lead Angle CommPort was initialized.

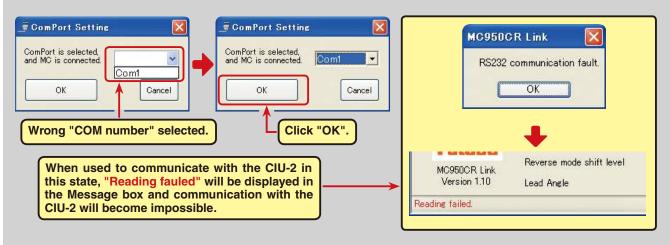
*Note:

When the CIU-2 is not connected to the USB port of the PC at MC950CR Link program starting, the COM number confirmed by Device Manager cannot be selected. When a COM number is not selected, the MC950CR Link program will not start even when the "OK" button is clicked.

Click the "Cancel" button, wait for the MC950CR program to start and then connect the CIU-2 to the USB port of the PC and select the COM number confirmed by Device Manager from the "ComPort" menu.



Also, when the wrong COM number is selected and the "OK" button is clicked, the MC950CR Link program is started, but communication is impossible even if a CIU-2 is connected. Select a COM number confirmed by Device Manager from the "ComPort" menu.

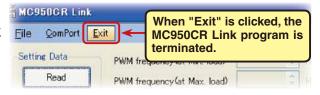


When the MC950CR Link program is started without a CIU-2 connected to the USB port of the PC after a COM number was selected at the "ComPort" menu, the window shown at the right appears. Start the MC950CR Link program by clicking "OK" and connect a CIU-2 to the USB port and check the COM number at the "ComPort" menu, and then click "OK".



MC950CR Link program termination

To terminate the MC950CR Link program, click "Exit" on the menu bar.



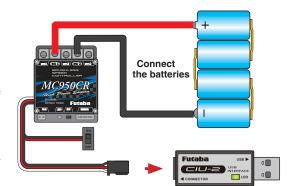
CIU-2 disconnection

The CIU-2 can be disconnected even when the PC power is on. However, do not disconnect the CIU-2 while it is communicating with the MC950CR.

Using the MC950CR Link program

CIU-2 and MC950CR connection

- 1. Connect the MC950CR to the CIU-2.
- 2. Connect the batteries to the MC950CR. (Refer to the MC950CR instruction manual for the connection method.)
- 3. Set the MC950CR power SW to ON. The MC950CR LED blinks orange. (red and green simultaneously)



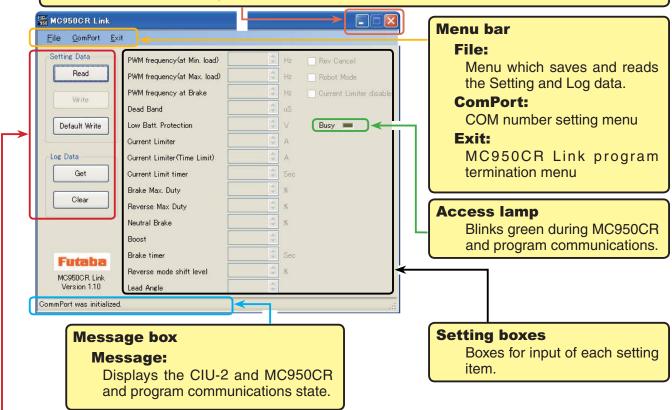
MC950CR Link program startup window

Minimize button

Button which causes the program window to collapse into its taskbar button at the bottom of the Windows desktop.

Close button

Closes (exits) the program. Same as "Exit" on the menu bar.



Buttons

Setting Data

Read

Write

Default Write

Get

Log Data

Setting Data Read:

Button which reads to the program the setting data of the connected MC950CR.

Setting Data Write:

Button which writes the setting data to the connected MC950CR.

Default Data Write:

Button which writes the standard setting data set at the factory to the connected MC950CR.

Data Get:

Button which reads to the program the log data of the connected MC950CR.

Data Clear:

Button which clears the log data of the connected MC950CR.

Reading log data recorded by the MC950CR

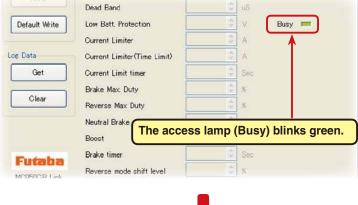
The logging function of the MC950CR can record a maximum of about 8 minutes of running current value and power supply voltage data at 1 second intervals. By connecting the MC950CR to a CIU-2, the recorded log data can be read and displayed by the MC950CR Link program. We recommend that this log data be referenced and made the setting data.

1. Connect the MC950CR to the CIU-2 and connect the batteries to the MC950CR.

Set the MC950CR power SW to ON.

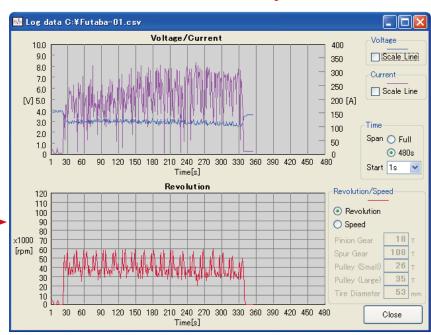
2. Click the "Data Get" button.





3. The log data to be recorded is read and a log data graph is displayed in a window separate from the MC950CR Link program startup window.

A log data graph is displayed in a separate window.



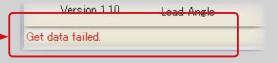
*Note:

When "MC cannot be set." shown at the right is displayed when the "Data Get" button is clicked, click the "OK" button and check for the following:

Batteries not connected to the MC950CR.

- *MC950CR power is OFF.
- *MC950CR is faulty.
- *When "Get data failed." is displayed in the Message box when the "OK" button is clicked, the log data could not be read normally.

When "Get data failed." is displayed in the Message box, the log data could not be read normally.



MC950CR Link

MC cannot be set.

OK

Log data window

Minimize button

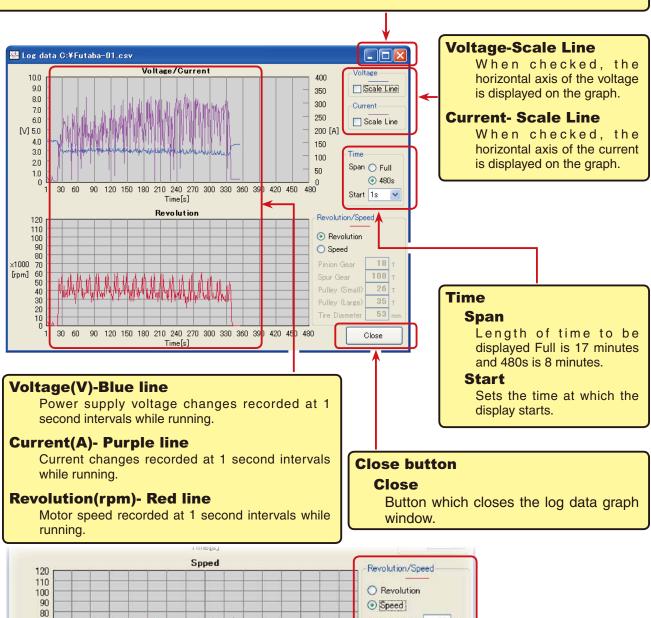
Button which collapses the log data graph window into its taskbar button at the bottom of the Windows desktop.

Maximize buttonRestore button

Button which expands the log data graph window to its original size. If the log data graph window is maximized, this button functions like the Minimize button.

Close button

Button which closes the program. Same as the "Close" button.



18 T Pinion Gear [km/h] 60 108 T Spur Gear 50 26 T Pulley (Small) 40 30 35 Pulley (Large) 20 Tire Diameter 53 mm 10 90 120 150 180 **Revolution/Speed**

When Speed is selected, the red line on the graph can be switched from motor speed display to vehicle speed (speed per hour) display.

To calculate the vehicle speed from the motor speed, the reduction gear ratio and tire diameter are necessary. Enter the number of teeth of each gear and the tire diameter. For direct drive vehicles, enter "1" at both Pulley (Small) and Pulley (Large).

*Since the vehicle speed is at most the calculated value, it may be different from the actual vehicle speed.

Saving log data and reading the saved data

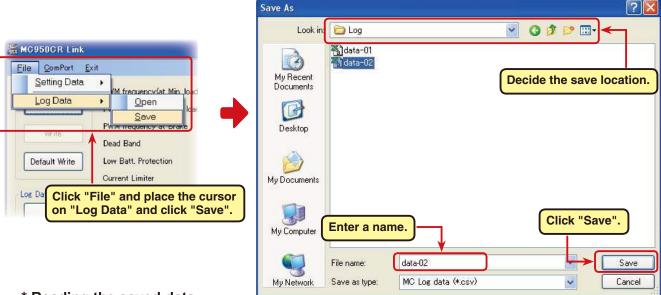
* Save

The log data read from the MC950CR can be saved to the computer by "Data Get" button. Since the data is saved in CSV format, it can be opened by CSV format spreadsheet program, etc.

The log data can be saved even after the graph window was closed. However, save the old log data before reading the new log data.

1. Click "File" on the menu bar and place the cursor on "Log Data" and click "Save". A "Save As" window opens.

2. Decide the save location and filename and save the data by clicking the "Save" button.



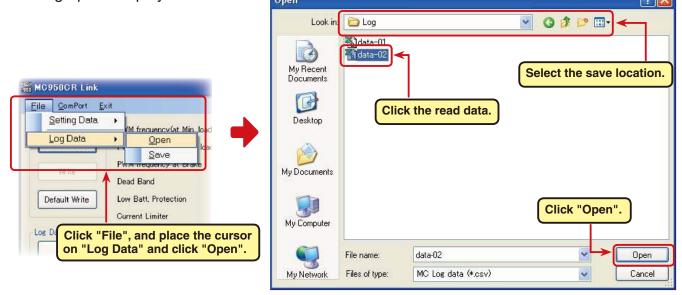
* Reading the saved data

The MC950CR Link program can read and display the log data saved to the computer.

1. Click "File" on the menu bar and place the cursor on "Log Data" and click "Open". An "Open" window opens.

2. Decide the save location and read data and click the "Open" button. A log data

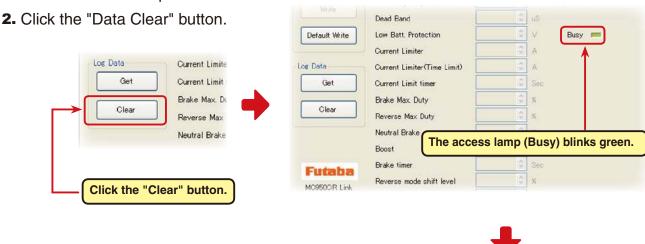
graph is displayed.



Clearing log data recorded by the MC950CR

To update the MC950CR log data, the old log data must be cleared. If the old log data is not cleared, the log data will not be updated.

1. Connect the MC950CR to a CIU-2 and connect the batteries to the MC950CR. Set the MC950CR power switch to ON.

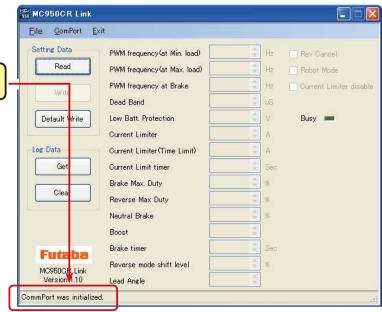


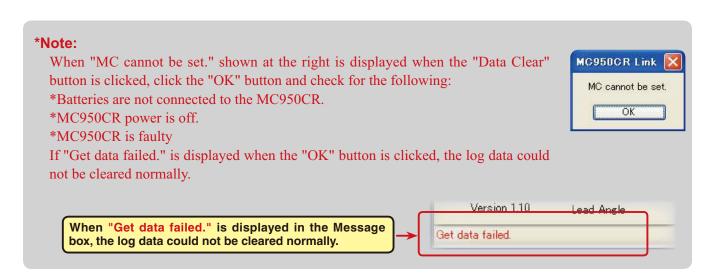
3. The recorded log data is cleared.

If clearing of the log data ends normally, "Completion" is displayed.

To record new log data after clearing the old log data, set the MC950CR power switch to OFF, and then set it back to ON and proceed.

If a new series of operations is performed with the MC950CR power left on, new log data will not be recorded.

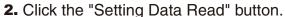




Reading setting data set at the MC950CR

The setting data currently set at the MC950CR connected to a CIU-2 is read and displayed in the MC950CR Link program startup window.

1. Connect the MC950CR to a CIU-2 and connect the batteries to the MC950CR. Set the MC950CR power switch to ON.





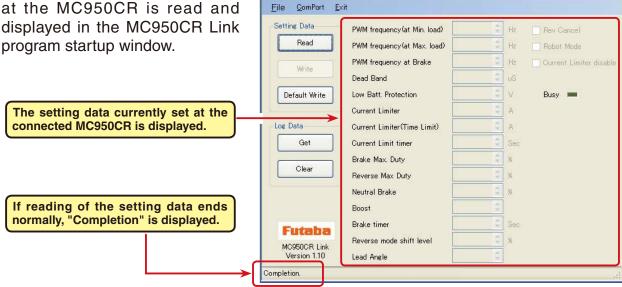


MC950CR Link

MC cannot be set.

OK

3. The setting data currently set at the MC950CR is read and displayed in the MC950CR Link



MC950CR Link

*Note:

When "MC cannot be set." shown at the right is displayed when the "Setting Data Read" button is clicked, click "OK" and check for the following:

- *Batteries are not connected to the MC950CR.
- *MC950CR power is OFF.
- *MC950CR is faulty.

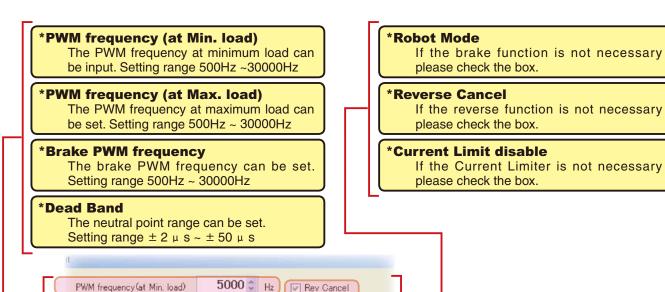
When "Reading Failed." is displayed in the Message box when the "OK" button is clicked, the setting data could not be read normally.

Version 110 When "Reading Failed." is displayed in the Message Reading Failed box, the setting data could not be read normally.

Setting items

The setting of each setting data can be changed by clicking ▲or ▼ at the right in lead side of the box of each setting item. Values can also be input directly from the keyboard.

Values can be input directly Value can be changed by from the keyboard. clicking ▲ or ▼. 3000



3000

1500 0

8 0

3.0 0

300 \$

Hz

uS

W

Robot Mode

Busy ===

☑ Current Limiter disable

Low Bat. Protection

The output cutoff voltage to the motor when the battery voltage drops can be set. Setting range 2.5V ~ 7.5V

*Current Limiter

The output current limit value can be set. The limiter can be disabled by checking "OFF". Setting range 50A ~ 300A, OFF

*Current Limiter (Time Limit)

Time limit current limiter current value setting Setting range 50A ~ 500A

*Current Limit timer

Time setting for time limit current limiter Setting range 0 secs ~ 240 secs Cancelled by 0 sec

*Brake Max. Duty

The braking force between the neutral and MAX brake points can be set. Setting range 0% ~ 100%

*Reverse Max. Duty

The reverse power between the neutral and MAX reverse points can be set. Setting range 0% ~ 100%

Neutral Brake

The neutral brake amount can be set. Setting range 0% (OFF) ~ 100%

300 ¢ A Current Limiter (Time Limit) 0 \$ Current Limit timer Sec 100 \$ % Brake Max. Duty 100 0 % Reverse Max Duty 2 0 % Neutral Brake 6 0 Boost 00 Brake timer Sec 10 0 % Reverse mode shift level Lead Angle **Boost**

PWM frequency(at Max. load)

PWM frequency at Brake

Low Batt, Protection

Dead Band

Current Limiter

Function which adjusts the movement characteristic from the throttle neutral position. Setting range 0~ 100

*Brake timer

The time needed to switch from brake operation to reverse operation can be set. Setting range 0 secs ~ 30 secs

*Reverse Mode Shift Level

The braking amount needed to switch to reverse operation can be set. Setting range 0% ~ 100%

*Lead Angle

The motor lead angle can be set by the MC950CR.

Setting range 0% ~ 100%

*PWM frequency (at Max. load) PWM frequency (at Min. load) Current Limiter

- PWM frequency (at Max. load) sets the PWM frequency at maximum load at the output current limit value set by Current Limiter.
- PWM frequency (at Min. load) sets the "0"A PWM frequency at minimum load.
- PWM frequency(at Min. load)
 5000 ♀ Hz

 PWM frequency(at Max. load)
 3000 ♀ Hz

 PWM frequency at Brake
 1500 ♀ Hz

 Dead Band
 8 ♀ uS

 Low Batt Protection
 3.0 ♀ V

 Current Limiter
 300 ♠ A
- Current Limiter sets the current value at maximum load here.

Since setting of the PWM frequency (at Max. load) is based on the output current limit value set by Current Limiter.

*PWM frequency (at Max. load) PWM frequency (at Min. load) Current Limiter

- PWM frequency (at Max. load) sets the PWM frequency at maximum load at the output current limit value set by Current Limiter.
- PWM frequency (at Min. load) sets the "0"A PWM frequency at minimum load.
- Current Limiter sets the current value at maximum load here.
 Since setting of the PWM frequency (at Max. load) is based on the output current limit value set by Current Limiter, Current Limiter does not have to be turned OFF except when a current exceeding 300A is generated.

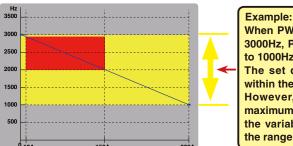
* Using log data to set the frequency and current limiter

Study at the maximum load current from the log data read from the MC950CR.

From this data, the Current Limiter value is set about 20 ~ 30A higher than the current at maximum load. (at Min. load), which sets the frequency when the load is small, is set to the high frequency side (large value) when extension is desired after straightaways and curves. (at Max. load), which sets the frequency when the load is large, is set to the high frequency side (large value) when you want to suppress the rise from low speed and when motor heating and commutator roughness are sensed. When the rise from low speed is poor, and becomes bad even when (at Max. load) is set to the low frequency side, use the log data to check if there was a momentary voltage drop. When you want to suppress the overall power, lengthen the run time, and otherwise improve efficiency, set both (at Max. load) and (at Min. load) to the high frequency side.

When you want to set a fixed PWM frequency at

full range regardless of the load current, set PWM frequency (at Max. load) and PWM frequency (at Min. load) to the same value.

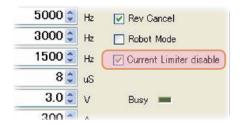


When PWM frequency (at Min. load) is set to 3000Hz, PWM frequency (at Max. load) is set to 1000Hz, and Current Limiter is set to 300A. The set drive frequency variable range is within the range indicated by the yellow color. However, when minimum load = 10A and maximum load = 150A at the running log data, the variable range during running becomes the range indicated by the red color.

*Current Limit disable

If you want to cancel the current limiter function, check the box.

In this case, the PWM frequency (at Max. load) standard becomes 500A without regard to the Current Limiter setting.



* Brake PWM at frequency

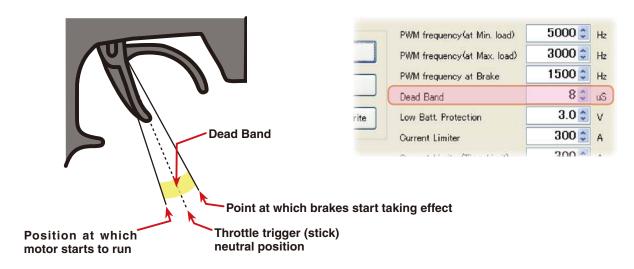
This setting can set the brake PWM frequency.

The lower the frequency (the smaller the value), the greater the braking force.



*Dead Band

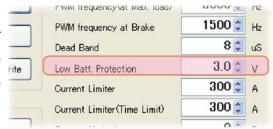
This sets the range (neutral point range) over which the MC950CR does not respond to transmitter throttle operation. The larger the set value, the wider this range.



*Low Bat Protection

This setting cuts off the output to the motor when the running battery voltage drops to the

set voltage to prevent the receiver from stopping operation when the supply of voltage to the receiver becomes insufficient while running due to a drop of the power supply voltage. When the power supply voltage recovers, power is supplied to the motor once more.

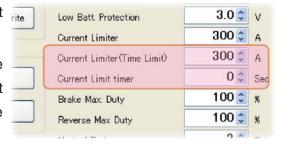


*Current Limiter (Time Limit) /Current Limit Timer

The output current can be limited up to the set time lapse from the start of running. This is effective in preventing the motor from outputting wasted energy when the voltage is high immediately after the power battery was recharged.

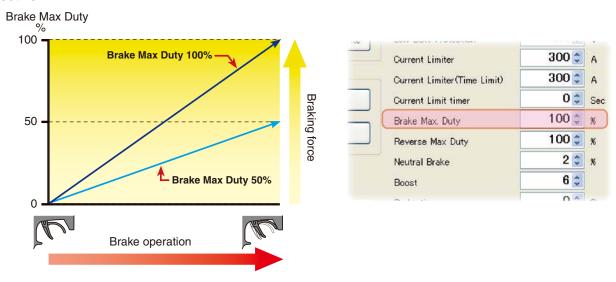
- Current Limiter (Time Limit) sets the maximum output current within the time the output current is limited.
- Current Limiter Timer sets the time the output current is limited. This function is disabled when set to "0" sec.

 Since the Current Limit Timer starts when the throttle is operated to the forward side and current is output to the motor, this function begins to operate when the motor is run during trim adjustment, etc.



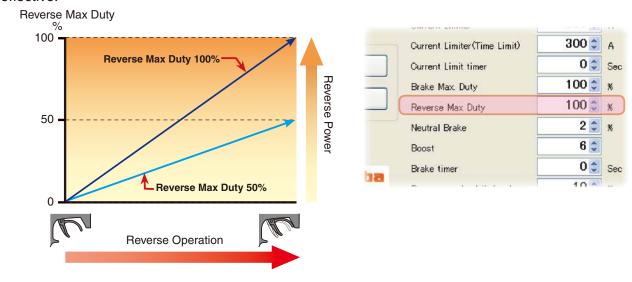
* Brake Max. Duty

This setting can set the braking force between the neutral point and Max brake point. The larger this value, the greater the braking force. When set to "0%", the brakes are not effective.



* Reverse Max. Duty

This setting can set the reverse power between the neutral point and Max reverse point. The larger this value, the greater the reverse power. When set to "0%", the reverses are not effective.



* Reverse Cancel

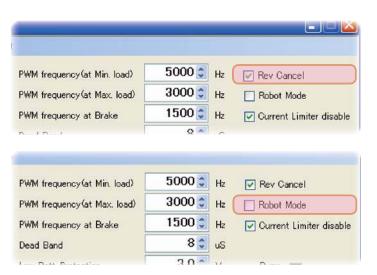
If the reverse function is not necessary please check the box.

When the box is checked there is only forward and brake operation

* Robot Mode

If the brake function is not necessary please check the box.

When the box is checked there is only forward and reverse operation



* Neutral Brake

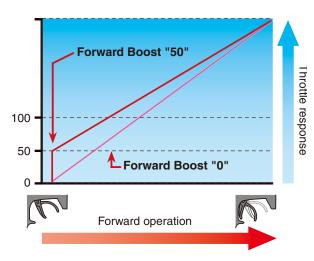
Make this setting when you want to use the brakes at the neutral throttle (OFF) position by throttle operation. The larger this value, the greater the braking force. When you want to use the neutral brake, set this value to "0%".

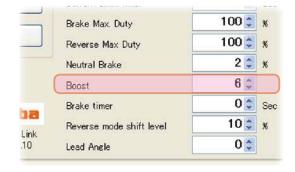


* Boost

Operation near the throttle trigger (stick) neutral position becomes a sharp rise.

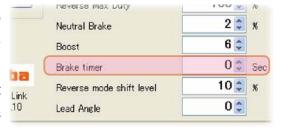
Forward Boost





* Brake timer

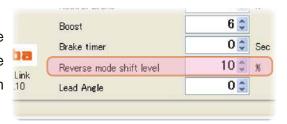
When the reverse function is used, usually if the throttle trigger (stick) is not once returned from the brake status to the neutral point and then operated at the brake (reverse) side, reverse operation is not performed. However, if the neutral point setting is



deliberately shifted to the forward side, when brake operation is repeated, reverse operation may be performed even if the trigger (stick) is not returned to the neutral point. The time needed to switch to reverse operation can be set to prevent this.

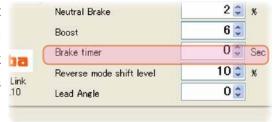
* Reverse Mode Shift Level

The reverse operation can be done with the throttle trigger (stick) to be thrown from brake status to the neutral. The value can set the amount of the brake in order to switch to the reverse operation.



* Lead Angle

The motor lead angle can be set by the MC950CR, but since the motor speed becomes the standard, when setting LeadAngle (Lead Angle value), always check the average speed by Log. Normally, use at "0" is recommended



Finding the lead angle

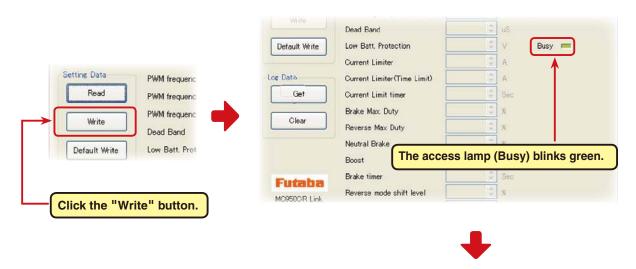
LeadAngle = Lead angle you want to set at the motor x 1,000,000

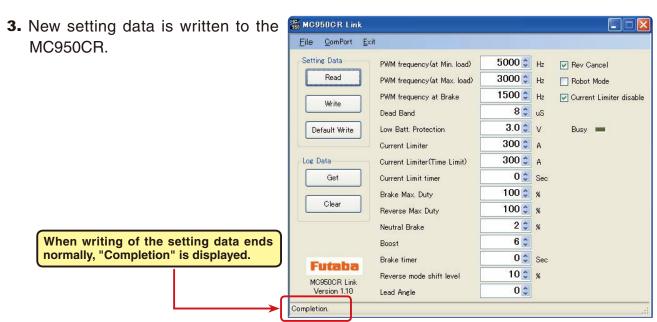
Normal average speed of motor x 3

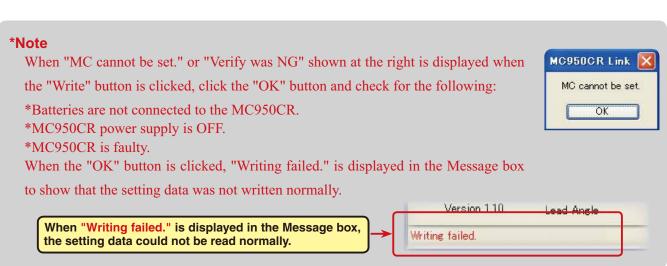
Writing setting data set to the MC950CR

Write new setting data to the MC950CR.

- **1.** Connect the MC950CR to a CIU-2 and connect the batteries to the MC950CR. Set the MC950CR power switch to ON.
- 2. After input of each item is complete, click the "Setting Data Write" button.







Saving setting data and reading the saved data

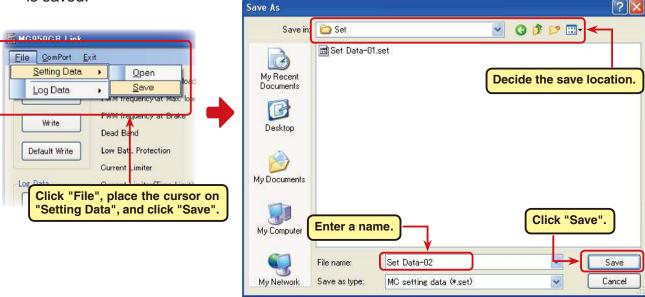
*Save

The setting data currently displayed in the MC950CR Link program startup window can be saved to a computer.

1. Click "File" on the menu bar and place the cursor on "Setting Data" and then click "Save". A "Save As" window opens.

2. Decide the save location and filename and click the "Save" button. The setting data

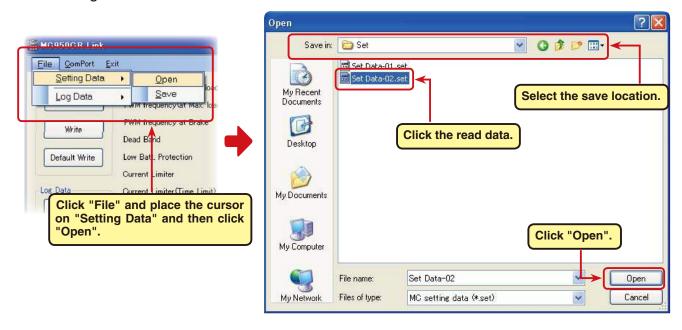
is saved.



* Reading saved data

Setting data saved to a computer can be read and displayed in the MC950CR Link program startup window and written to the MC950CR.

- **1.** Click "File" on the menu bar and place the cursor on "Setting Data" and click "Open". An "Open" window opens.
- 2. Decide the save location and read data and click the "Open" button. The setting data to be saved is displayed in the MC950CR Link program startup window.
 To write this data directly to the MC950CR, see "Writing setting data to MC950CR" on Page 20.



Initializing the MC950CR

This function returns the MC950CR setting data to the factory setting.

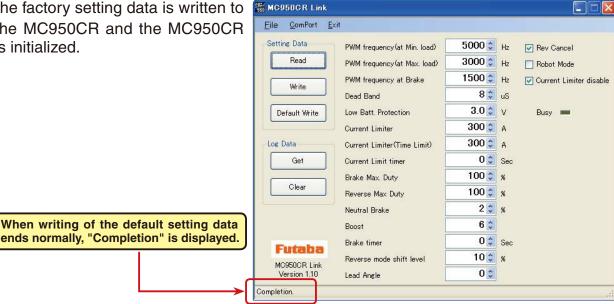
Since the setting data, neutral, high point, and brake point are all initialized at the factory, reset them.

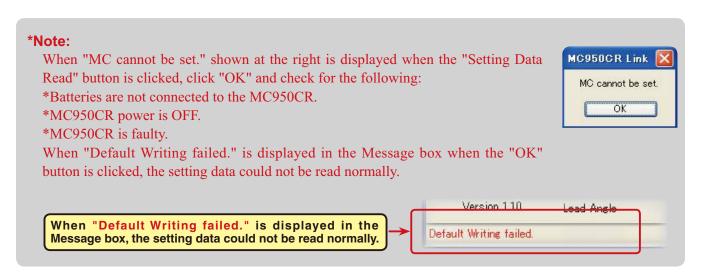
1. Connect the MC950CR to a CIU-2 and connect the batteries to the MC950CR. Set the MC950CR power switch to ON.



3. The factory setting data is written to the MC950CR and the MC950CR is initialized.

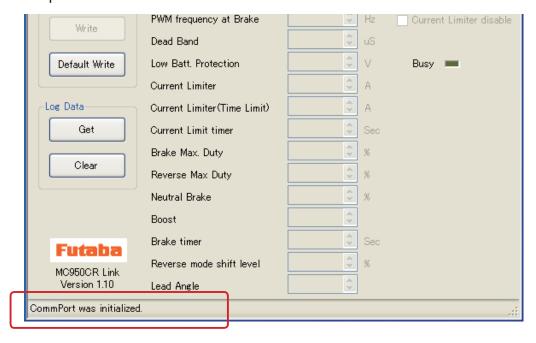
Click the "Default Write" button.





Messages List

The following shows the contents displayed in the message box (Message) in the software startup window.



"ComPort was initialized."

Shows the COM port setting state. (Displayed when MC950CR Link program starts.)

Since the COM port is set even if the wrong COM number is set, this message is displayed.

However, when the MC950CR tries to communicate with the CIU-2, "RS232 communication fault" is displayed, and communication with the CIU-2 becomes impossible.



"LabelStatus"

COM number is not set.

Select the correct COM number from the ComPort menu. (See Page 8.)

"ComPort cannot be opened."

The CIU-2 is not connected to the USB port of the PC

"Completion"

Displayed when read, write, clear, and initialization of each data ends normally.

"Get data failed.","Clear data failed","Reading failed","Wrating failed","Default Writing failed"

When read, write, clear, or initialization of each data did not end normally, the message shown at the right is displayed. When the "OK" button is clicked, this message is displayed. (See Pages 10, 13, 14, 20, and 22.)



When communication with the CIU-2 was attempted when the wrong

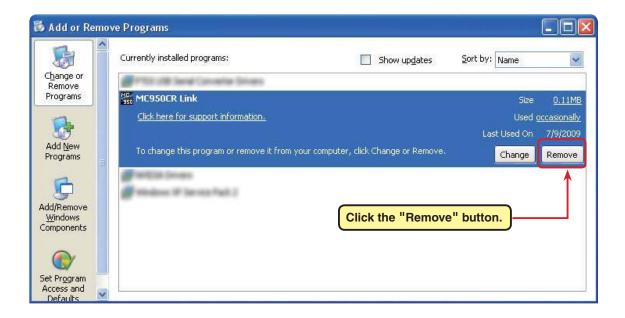
COM number was set, the message shown at the right is displayed. When the "OK" button is clicked, this message is displayed. Since the COM number is wrong, communication with the CIU-2 is impossible. Set the correct COM number at the "ComPort" menu. (See Page. 8.)



MC950CR Link program removal (uninstall)

To remove (uninstall) the MC950CR Link program from the computer, use the Windows "Add/Remove Programs" function. Since the operation method differs with the OS used, refer to Windows help, etc.

- **1.** Open "Control Panel" from the "Start" button at the bottom right side of the Windows XP desktop.
- 2. Launch "Add/Remove Programs" from the opened "Control Panel".
- **3.** After "Add/Remove Programs" is displayed, select "MC950CR Link" and click the "Change/Remove" button.



4. "Are you sure you want to completely remove MC950CR Link and all of its components?" is displayed. Click the "Yes" button.



5. This completes removal (uninstall) of the MC950CR Link program.