Futaba

**USB INTERFACE
CIU-2**

MC601C Link Program Manual

*Note:The MC601C Link program is for Windows Vista/XP/2000 use and is not compatible with other OS.

Downloaded Zip file extraction (decompression)

The downloaded MC601 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 MC601C Link Eng V100 to display its contents.

2. Click "Extract all files". The Extraction Wizard launches.

3. Extract (decompress) Zip file MC601C Link Eng V100 to the same location as the Zip file storage location.

*Example: For Windows XP
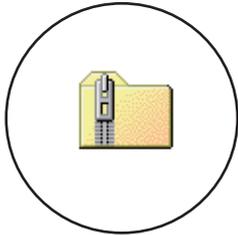
Double click Zip file "MC601 Link Eng V100".

Click "Extract all files".

Click "Next".

Confirm the extraction destination. (Zip file MC850C Link Eng V100 save location.)

Click "Next".

Click "Finish".
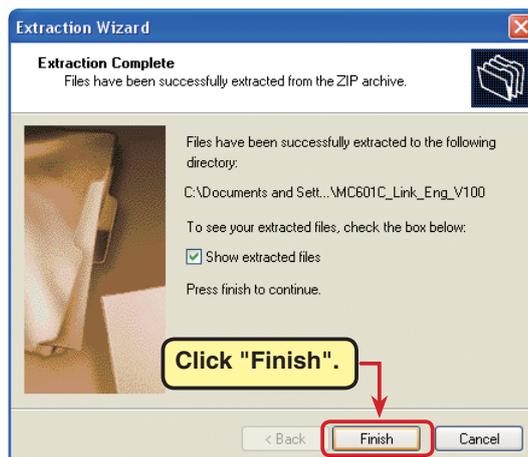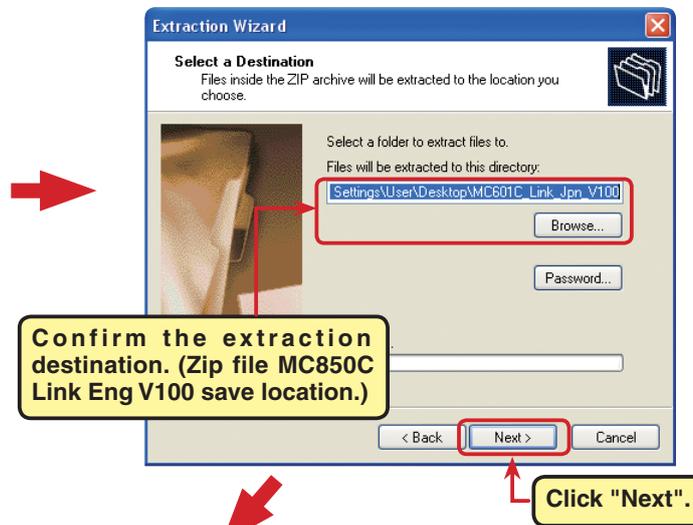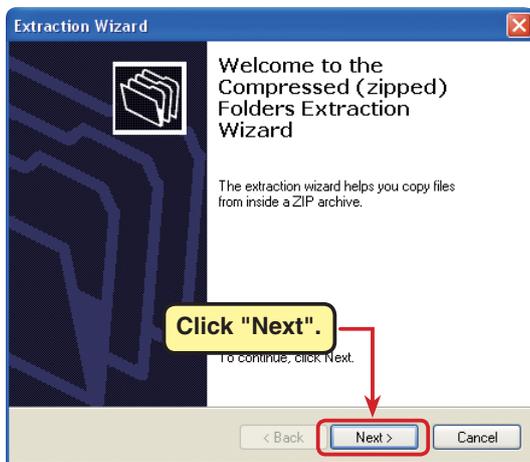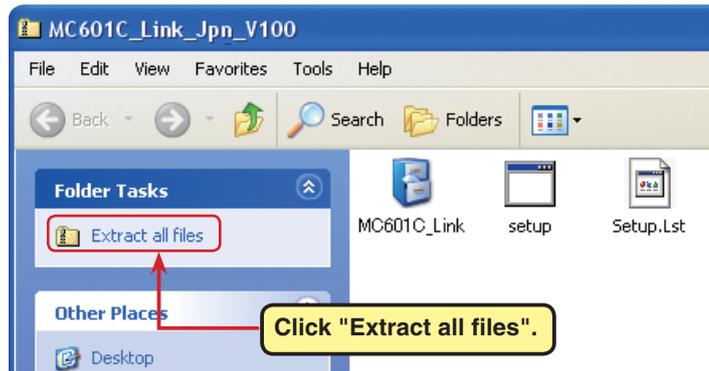
Extracted (decompressed) file confirmation

Let's confirm the extracted (decompressed) file.

1. At the end of extraction (decompression), a folder named MC601C Link Eng V100 like that shown below is created.

2. Double click MC601C Link Eng V100. The contents of the folder are displayed.

MC601C_Link_Eng_V100

MC601C_Link   setup   SETUP.LST

3

MC601C Link program installation

Before installing the MC601C Link program, confirm that all other applications are closed. Close all virus check and other resident programs, if any.

1. Select and double click the folder named MC601C Link Eng V100 created by downloaded Zip file extraction (decompression). The contents of the folder are displayed.

2. Double click the EXE file named "setup".

Double click "setup".
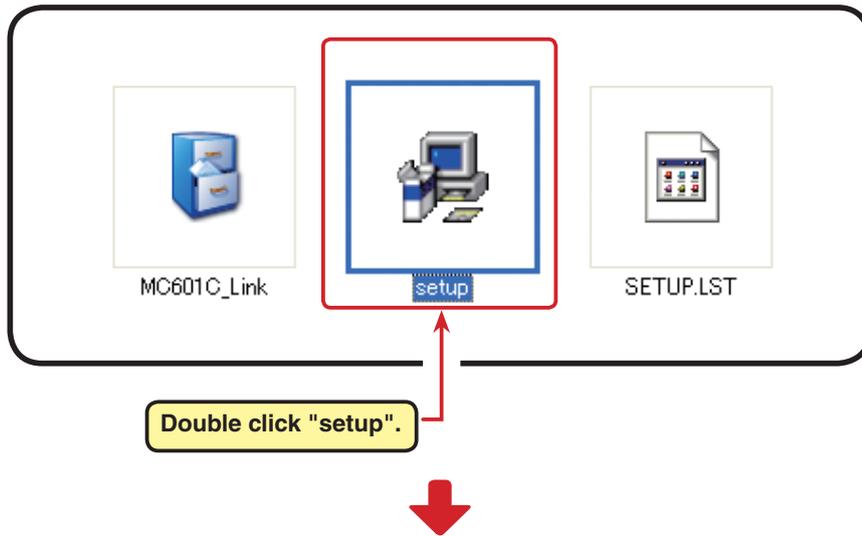
**3.** After the MC601C Link Setup window appears, click "OK".

Click "OK".
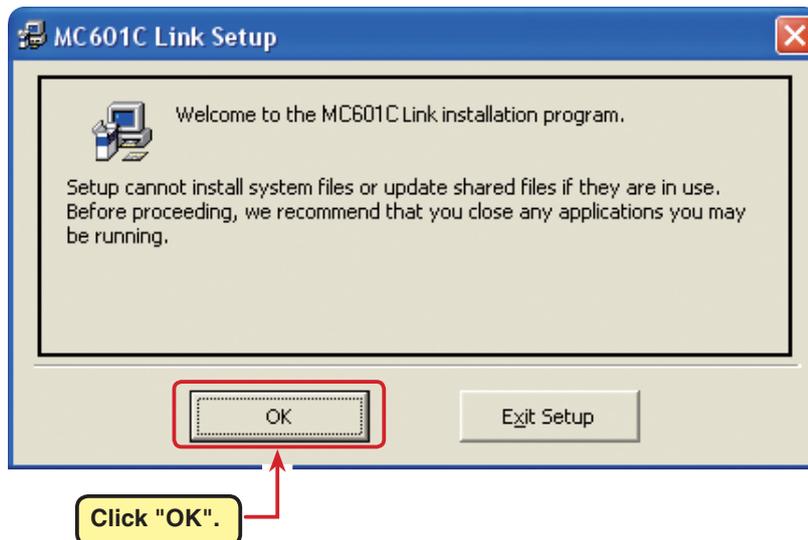
4. Confirm the program directory (save destination) at "Directory:" and click the start setup button. To change the directory, click "Change Directory" and specify the directory which is to save the program and then click the start setup button.

Start setup button

MC601C Link Setup

Begin the installation by clicking the button below.

Click this button to install MC601C Link software to the specified destination directory.

Directory:

C:\Program Files\MC601C Link\   Change Directory

Confirm the program save destination at "Directory:". To change the save destination, click "Change Directory" and specify the directory which is to save the program.

Exit Setup

5. Decide the program group to be set up. As standard, a new program group named Futaba is created and the program is installed there. A new group name can also be created or selected from the existing group list. After deciding the program group, click "Continue"

MC601C Link - Choose Program Group

Setup will add items to the group shown in the Pr You can enter a new group name or select one fr Groups list.

As standard, the group name is Futaba. When creating your own new group name, key in the new name here from the keyboard.

Program Group:

Futaba

Existing Groups:

Accessories
Futaba
Startup

Click "Continue" to continue setup.

When selecting the group name from an existing group list, click the group name.

Continue   Cancel

6. After "MC601C Link _Setup was completed successfully" is displayed, click "OK". The above completes MC601C Link program installation.

MC601C Link Setup

MC601C Link Setup was completed successfully.

OK   **Click "OK".**

MC601C Link program startup and termination

MC601C 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" - "MC601C Link", in that order. The MC601C Link program starts up.

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

Select "MC850C Link".

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.

Click "v" and select from the list.

Match "COM number".

Click "OK".
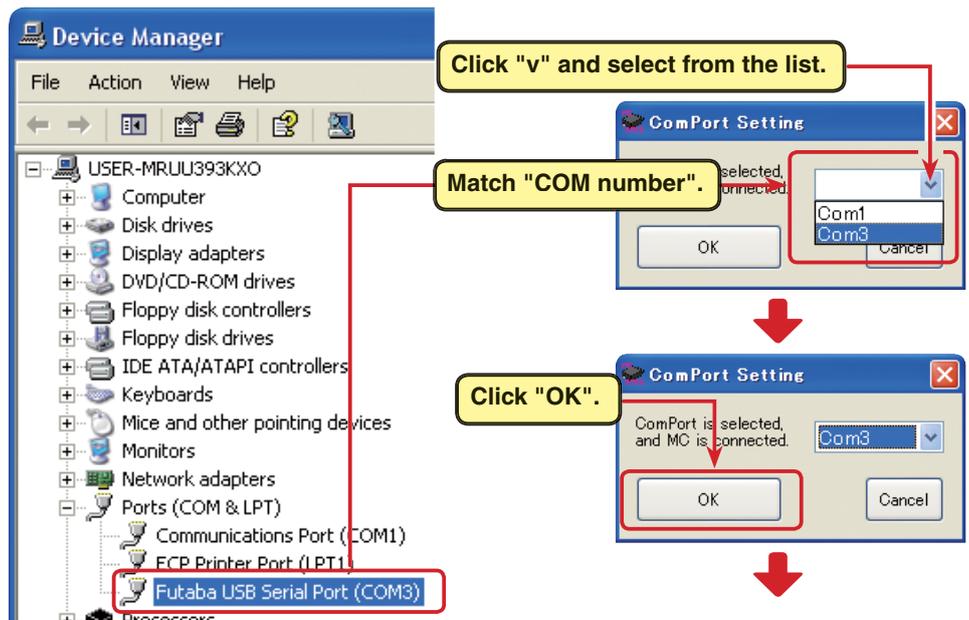
At the end of COM number setting, the MC601C Link program startup window shown at the right opens.

The message "ComPort was initialized" appearing in the Message box shows that a COM port was set.
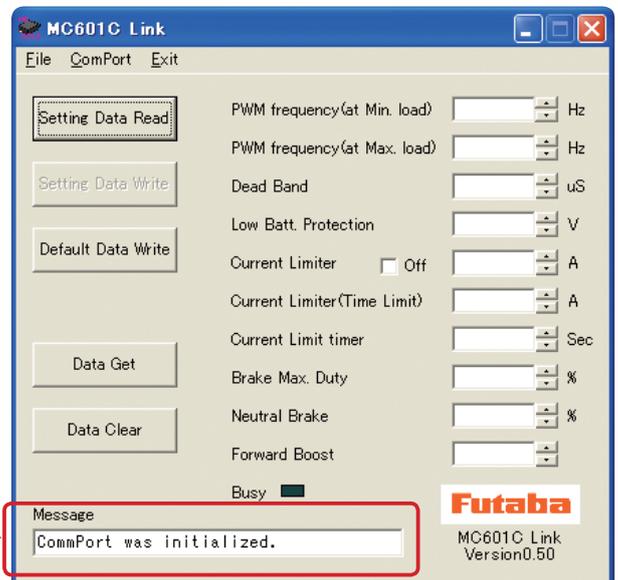
*Note:

When the CIU-2 is not connected to the USB port of the PC at MC601C Link program starting, the COM number confirmed by Device Manager cannot be selected. When a COM number is not selected, the MC601C Link program will not start even when the "OK" button is clicked.

Click the "Cancel" button, wait for the MC601C 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.

Click "Cancel".

After connecting the CIU-2 to the USB port of the PC, click the "Comport" menu and select the correct COM port number at ComPort Setting.

"ComPort cannot be opened." displayed in the Message box shows that a COM port is not set.
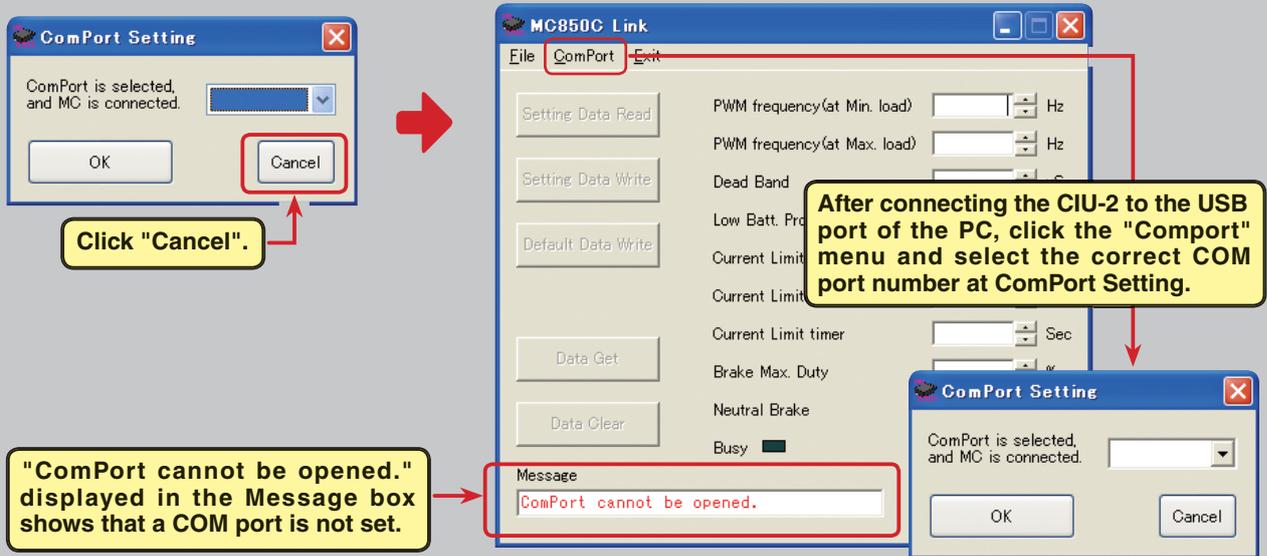
Also, when the wrong COM number is selected and the "OK" button is clicked, the MC601C Link program is started, but communication is impossible even if a CIU-2 is connected. Select a COM number confirmed by Device Manager from the "ComPort" menu.

Wrong "COM number" selected.

Click "OK".

When used to communicate with the CIU-2 in this state, "RS232 communication fault" will be displayed in the Message box and communication with the CIU-2 will become impossible.
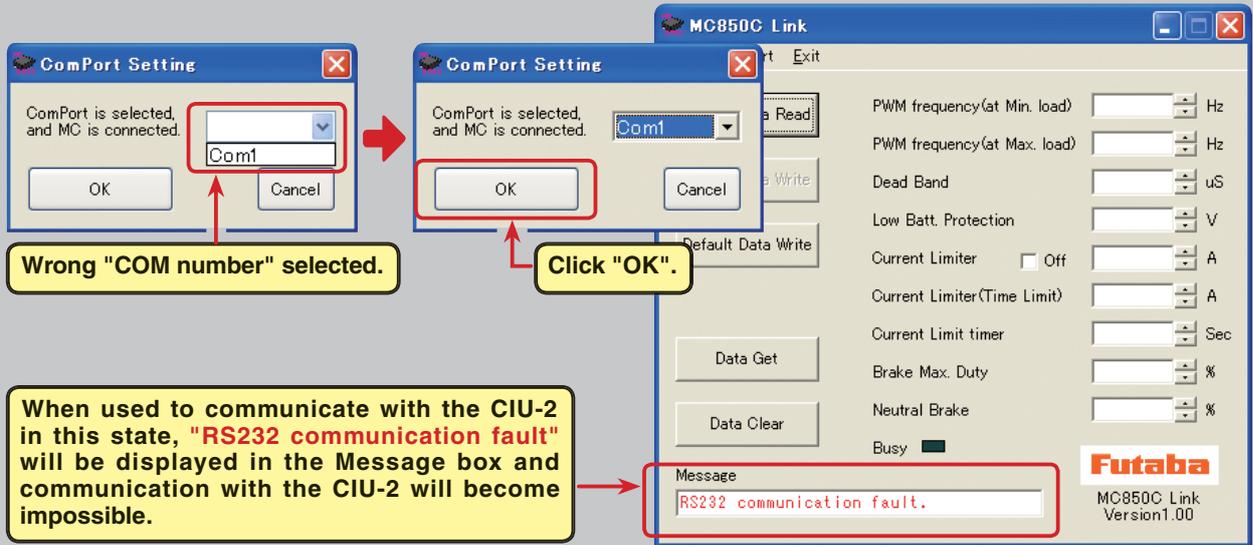
MC601C Link program termination

To terminate the MC601C Link program, click "Exit" on the menu bar.

When "Exit" is clicked, the MC601C Link program is terminated.
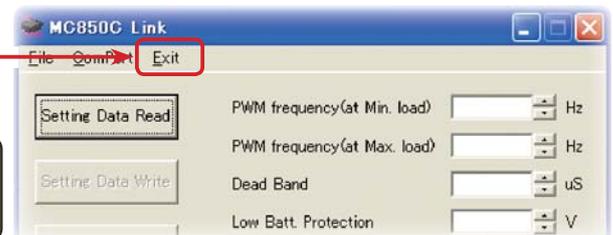
CIU-2 disconnection

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 MC601C.

Using the MC601C Link program

CIU-2 and MC601C connection

1. Connect the MC601C to the CIU-2.

2. Connect the batteries to the MC601C.
(Refer to the MC601C instruction manual for the connection method.)

3. Set the MC601C power SW to ON.
The MC601C LED blinks orange. (red and green simultaneously)

Connect the batteries
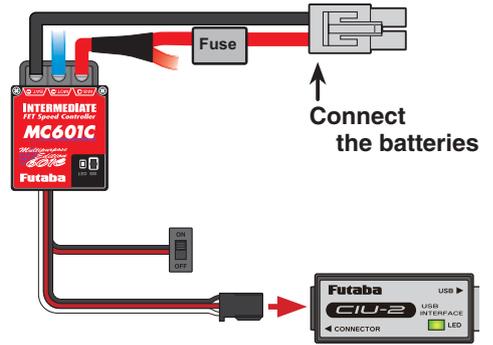
MC601C Link program startup window

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.

Menu bar

File:
Menu which saves and reads the Setting and Log data.

ComPort:
COM number setting menu

Exit:
MC601C Link program termination menu

Setting boxes
Boxes for input of each setting item.

Access lamp
Blinks green during MC601C and program communications.

Message box

Message:
Displays the CIU-2 and MC601C and program communications state.

Buttons

Setting Data Read:
Button which reads to the program the setting data of the connected MC601C.

Setting Data Write:
Button which writes the setting data to the connected MC601C.

Default Data Write:
Button which writes the standard setting data set at the factory to the connected MC601C.

Data Get:
Button which reads to the program the log data of the connected MC601C.

Data Clear:
Button which clears the log data of the connected MC601C.

8

Reading log data recorded by the MC601C

The logging function of the MC601C can record a maximum of about 8 minutes of running current value and power supply voltage data at 1 second intervals. By connecting the MC601C to a CIU-2, the recorded log data can be read and displayed by the MC601C Link program. We recommend that this log data be referenced and made the setting data.

1. Connect the MC601C to the CIU-2 and connect the batteries to the MC601C.

Set the MC601C power SW to ON.

2. Click the "Data Get" button.

Click the "Data Get" button.

"Data Get" is displayed in the Message box and the access lamp (Busy) blinks green.

3. The log data to be recorded is read and a log data graph is displayed in a window separate from the MC601C Link program startup window.

A log data graph is displayed in a separate window.

When reading of the log data ends normally, "Completion" is displayed.
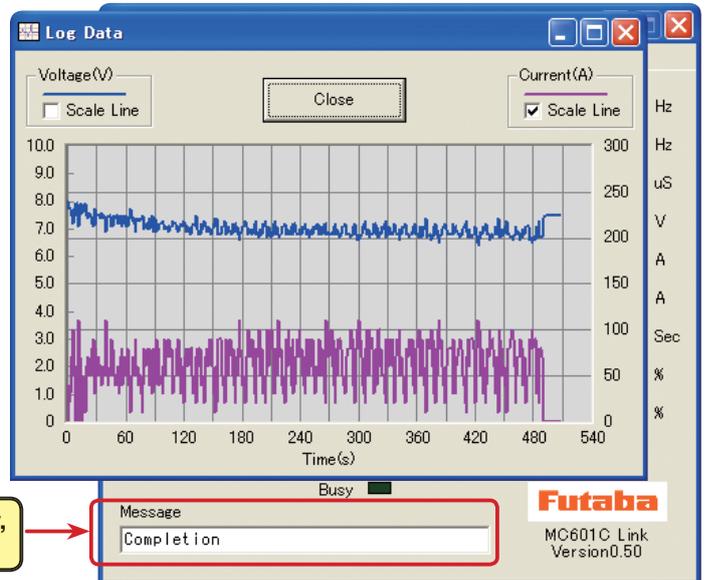
*Note:

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 MC601C.

*MC601C power is OFF.

*MC601C is faulty.

*When "MC cannot be set." is displayed in the Message box when the "OK" button is clicked, the log data could not be read normally.

**When "MC cannot be set." is displayed in the Message box, the log data could not be read normally.**

Log data window

Voltage(V)-Blue line
Power supply voltage changes recorded at 1 second intervals while running.

Close button
Close
Button which closes the log data graph window.
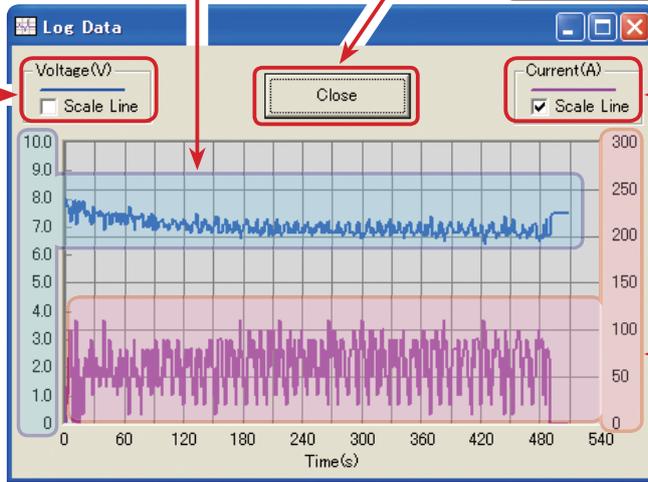
Current(A)- Red line
Current changes recorded at 1 second intervals while running.

Current(A)- Red Scale Line
When checked, the horizontal axis of the current is displayed on the graph.
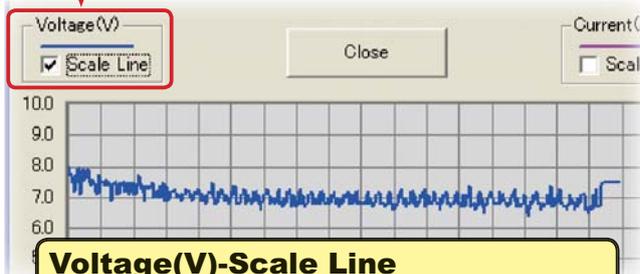
Voltage(V)-Scale Line
When checked, the horizontal axis of the voltage is displayed on the graph.
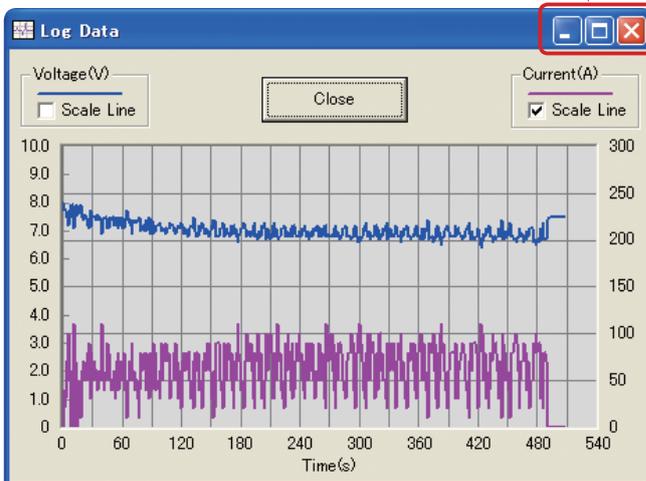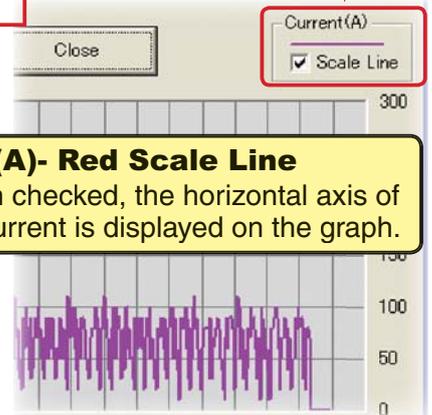
Minimize button
Button which collapses the log data graph window into its taskbar button at the bottom of the Windows desktop.

Maximize button
Restore 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.

## Saving log data and reading the saved data

* Save

The log data read from the MC601C 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.

Click "File" and place the cursor on "Log Data" and click "Save".

Decide the save location.

Enter a name.

Click "Save".
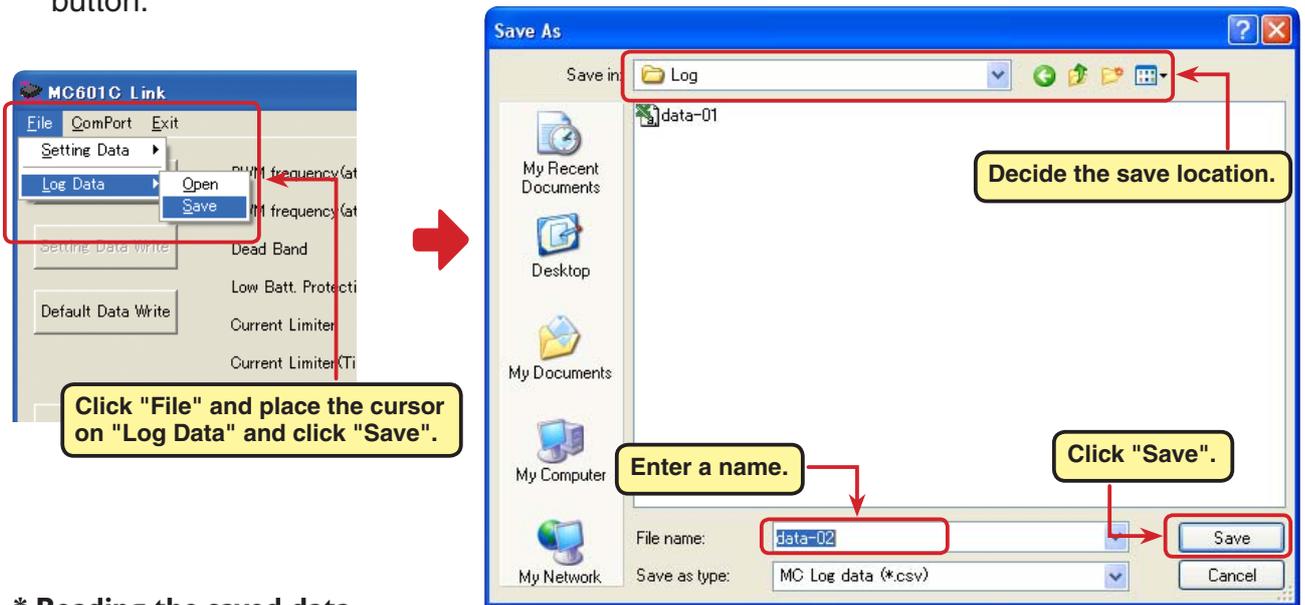
* Reading the saved data

The MC601C 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.

Click "File", and place the cursor on "Log Data" and click "Open".

Select the save location.

Click the read data.

Click "Open".
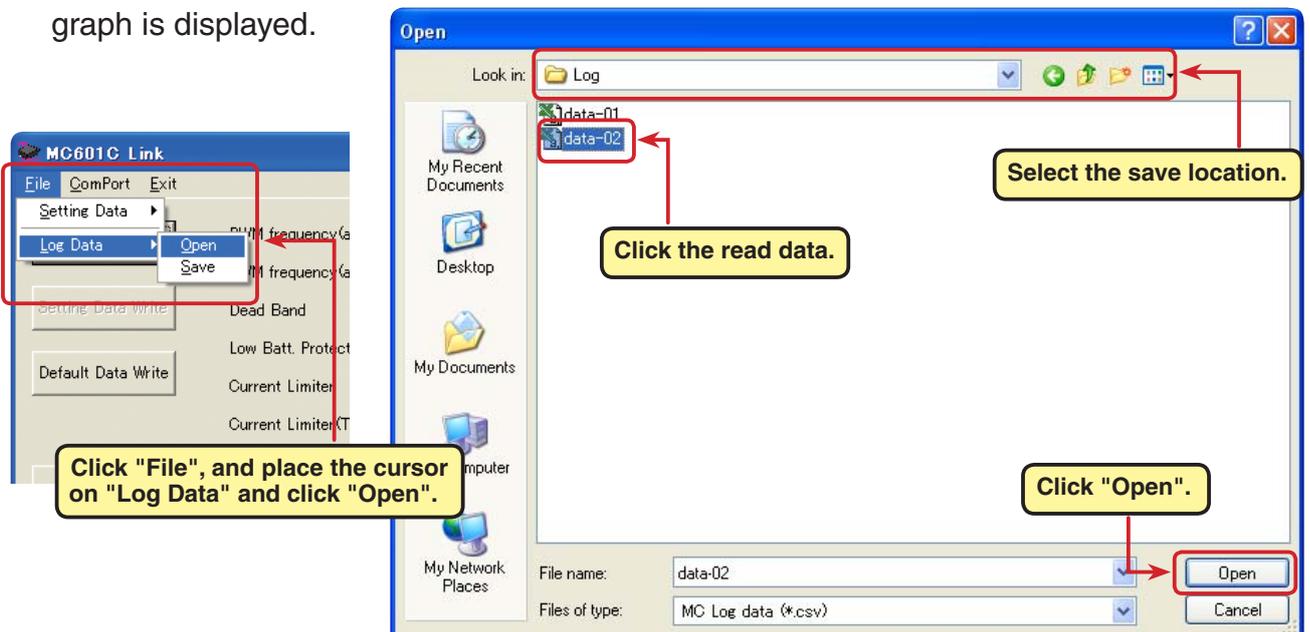
Clearing log data recorded by the MC601C

To update the MC601C 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 MC601C to a CIU-2 and connect the batteries to the MC601C.

Set the MC601C power switch to ON.

2. Click the "Data Clear" button.

Click "Data Clear".

"Data Clear" appears in the Message box and the access lamp (Busy) blinks green.

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 MC601C power switch to OFF, and then set it back to ON and proceed.

If a new series of operations is performed with the MC601C power left on, new log data will not be recorded.

*Note:

When "MC cannot be set." shown at the right is displayed when the "Data Clear" button is clicked, click the "OK" button and check for the following:
*Batteries are not connected to the MC601C.
*MC601C power is off.
*MC601C is faulty
If "MC cannot be set." is displayed when the "OK" button is clicked, the log data could not be cleared normally.

When "MC cannot be set." is displayed in the Message box, the log data could not be cleared normally.

Reading setting data set at the MC601C

The setting data currently set at the MC601C connected to a CIU-2 is read and displayed in the MC601C Link program startup window.

1. Connect the MC601C to a CIU-2 and connect the batteries to the MC601C.

Set the MC601C power switch to ON.

2. Click the "Setting Data Read" button.

Click the "Setting Data Read" button.

Since it usually takes about 1 second to read the setting data, "Setting Data Read" is displayed in the Message box and the access lamp (Busy) blinks for only a moment.

3. The setting data currently set at the MC601C is read and displayed in the MC601C Link program startup window.

The setting data currently set at the connected MC601C is displayed.

If reading of the setting data ends normally, "Completion" is displayed.

*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 MC601C.
*MC601C power is OFF.
*MC601C is faulty.
When "MC cannot be set." is displayed in the Message box when the "OK" button is clicked, the setting data could not be read normally.

When "MC cannot be set." is displayed in the Message box, the setting data could not be read normally.
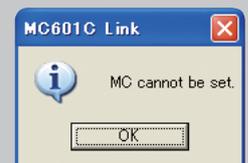
Setting items

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

When a value exceeding the setting range is input when entering values directly from the keyboard, the characters will turn red to show that they are unsuitable.

Values can be input directly from the keyboard.

Value can be changed by clicking ▲ or ▼.

in. load) `3000` Hz

When a value exceeding the setting range is input when entering values directly from the keyboard, the characters turn red.

`10001` Hz

*PWM frequency (at Min. load)
The PWM frequency at minimum load can be input.
Setting range 100Hz ~ 10000Hz

*PWM frequency (at Max. load)
The PWM frequency at maximum load can be set.
Setting range 100Hz ~ 10000Hz

*Dead Band
The neutral point range can be set.
Setting range ± 2 μ s ~ ± 50 μ s

*Low Bat. Protection
The output cutoff voltage to the motor when the battery voltage drops can be set.
Setting range 2.5V ~ 6.0V

*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 ~ 300A

*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%

*Neutral Brake
The neutral brake amount can be set.
Setting range 0% (OFF) ~ 100%
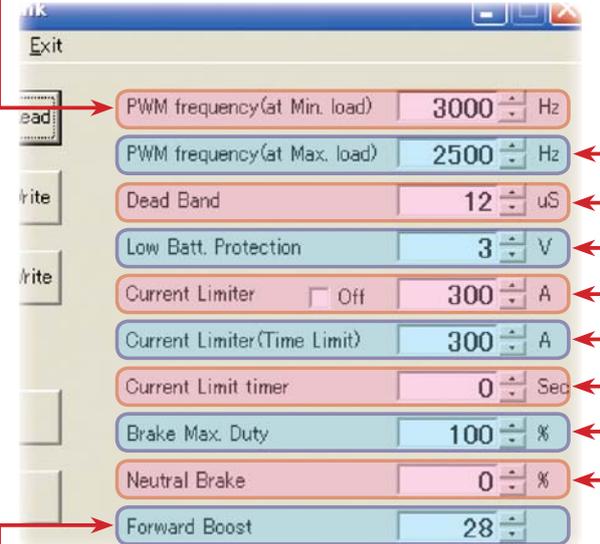
*Forward Boost
Function which adjusts the movement characteristic from the throttle neutral position
Setting range 0~ 100

Exit

PWM frequency(at Min. load)	3000	Hz
PWM frequency(at Max. load)	2500	Hz
Dead Band	12	uS
Low Batt. Protection	3	V
Current Limiter ☐ Off	300	A
Current Limiter(Time Limit)	300	A
Current Limit timer	0	Sec
Brake Max. Duty	100	%
Neutral Brake	0	%
Forward Boost	28	

*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.

PWM frequency(at Min. load)	3000	Hz
PWM frequency(at Max. load)	2500	Hz
Dead Band	12	uS
Low Batt. Protection	3	V
Current Limiter ☐ Off	300	A
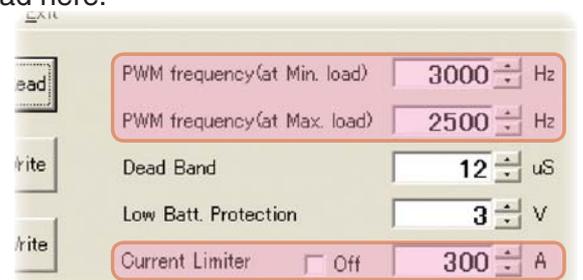
* Using log data to set the frequency and current limiter

Study at the maximum load current from the log data read from the MC601C.

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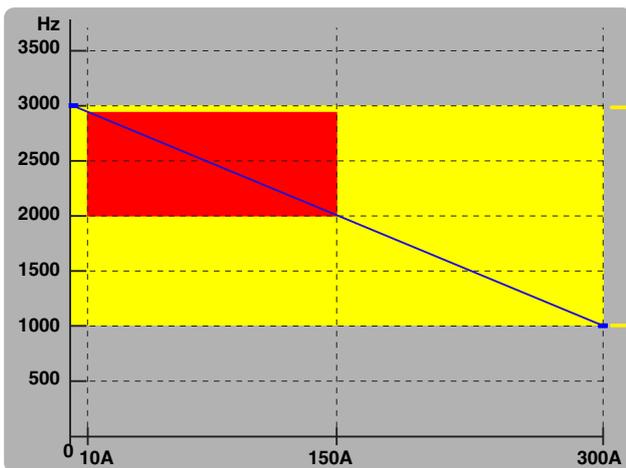
Example:
When PWM frequency (at Min. load) is set to 3000Hz, PWM frequency (at Max. load) is set to 1000Hz, and Current Limiter is set to 300A.
The set drive frequency variable range is within the range indicated by the yellow color. However, when minimum load = 10A and maximum load = 150A at the running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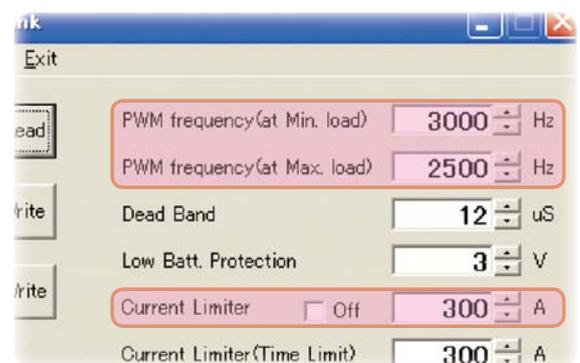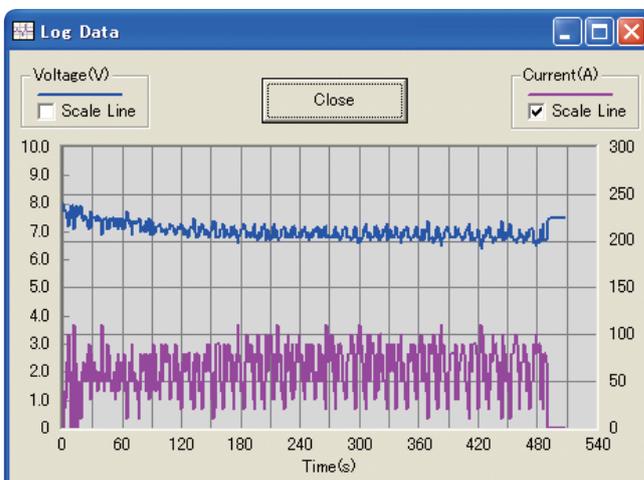
*Dead Band

This sets the range (neutral point range) over which the MC601C does not respond to transmitter throttle operation.

The larger the set value, the wider this range.

Dead Band

Point at which brakes start taking effect

Position at which motor starts to run

Throttle trigger (stick) neutral position
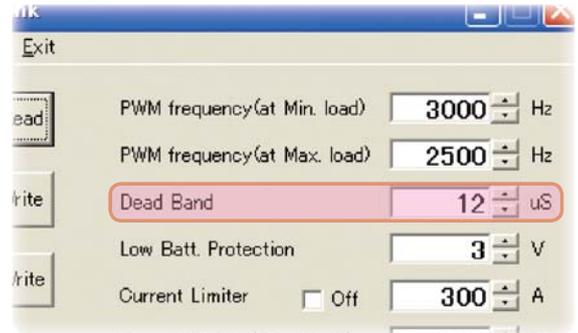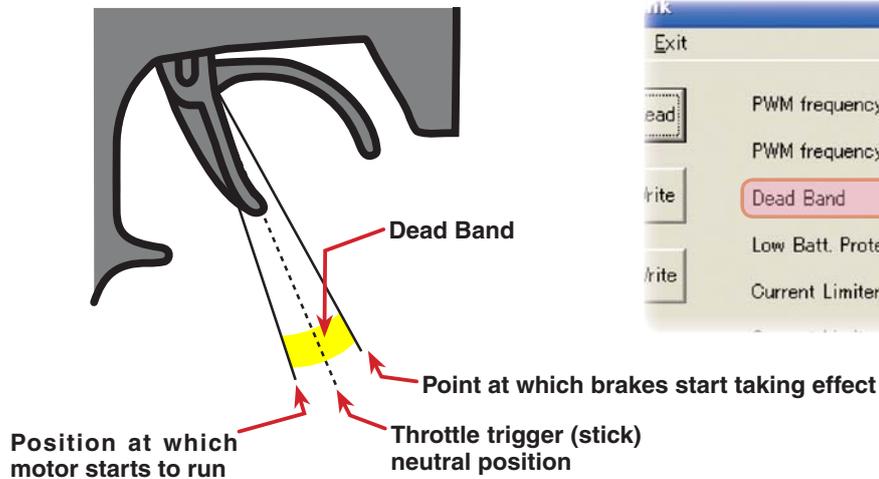
*Low Bat Protection

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.
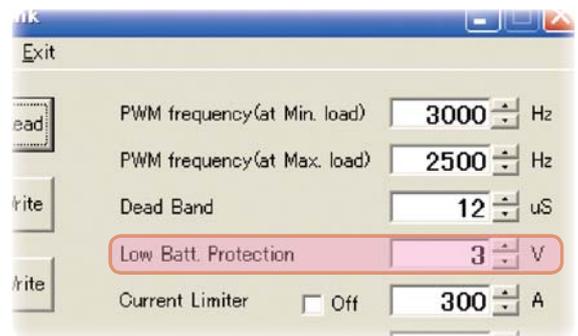
*Current Limiter (Time Limit) Current Limit Timer

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.

Low Batt. Protection   3 V
Current Limiter ☐ Off   170 A
Current Limiter (Time Limit)   300 A
Current Limit timer   0 Sec
Brake Max. Duty   100 %
Neutral Brake   0 %

Brake Max Duty
%
100

Brake Max Duty 100%

50

Braking force

Brake Max Duty 50%

0
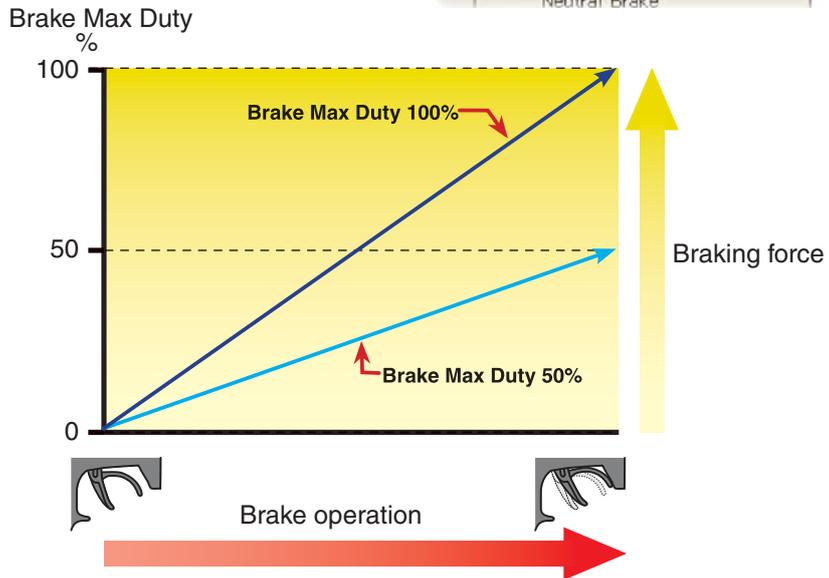
Brake operation

* 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%".

Current Limiter ☐ Off   300 A
Current Limiter (Time Limit)   300 A
Current Limit timer   0 Sec
Brake Max. Duty   100 %
Neutral Brake   0 %
Forward Boost   28
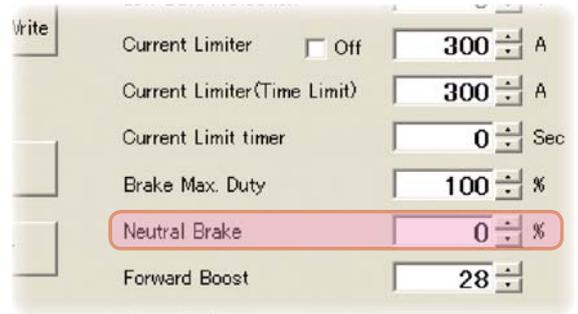
* Forward Boost

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

Current Limiter ☐ Off   300 A
Current Limiter (Time Limit)   300 A
Current Limit timer   0 Sec
Brake Max. Duty   100 %
Neutral Brake   0 %

Forward Boost

Forward Boost "50"

Throttle response

100

50

Forward Boost "0"

0

Forward operation
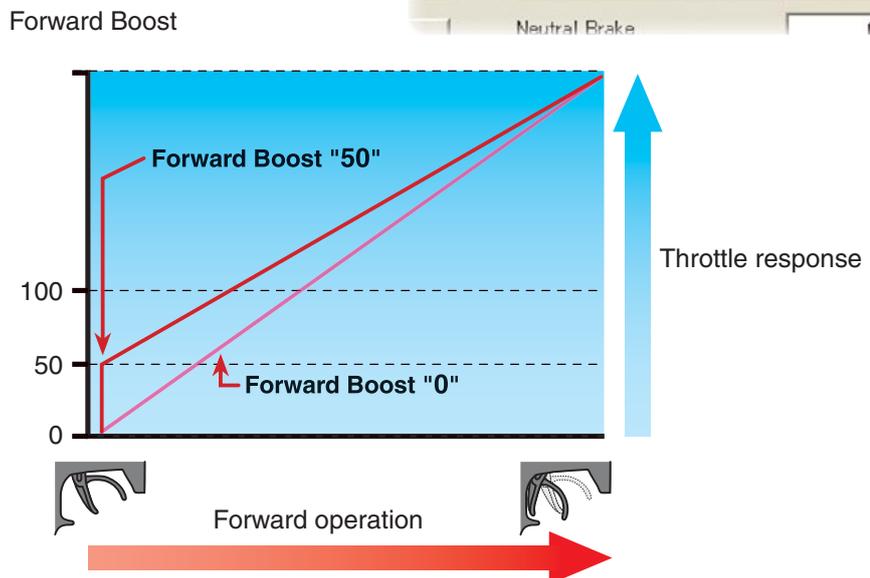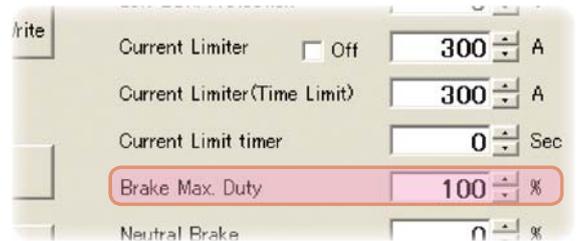
Writing setting data set to the MC601C

Write new setting data to the MC601C.

1. Connect the MC601C to a CIU-2 and connect the batteries to the MC601C.

Set the MC601 power switch to ON.

2. After input of each item is complete, click the "Setting Data Write" button.

Click "Setting Data Write" button.

"Setting Data Write" is displayed in the Message box, and the access lamp (Busy) lamp blinks green.

3. New setting data is written to the MC601C.

When writing of the setting data ends normally, "Completion" is displayed.

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*Note

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

*Batteries are not connected to the MC601C.

*MC601 power supply is OFF.

*MC601C is faulty.

When the "OK" button is clicked, "MC cannot be set." or "Verify was NG" is displayed in the Message box to show that the setting data was not written normally.

"MC cannot be set." or "Verify was NG" is display in the Message box to shows that the setting data was not written normally.

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## Saving setting data and reading the saved data

* Save

The setting data currently displayed in the MC601C 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.

Click "File", place the cursor on "Setting Data", and click "Save".

Decide the save location.

Enter a name.

Click "Save".
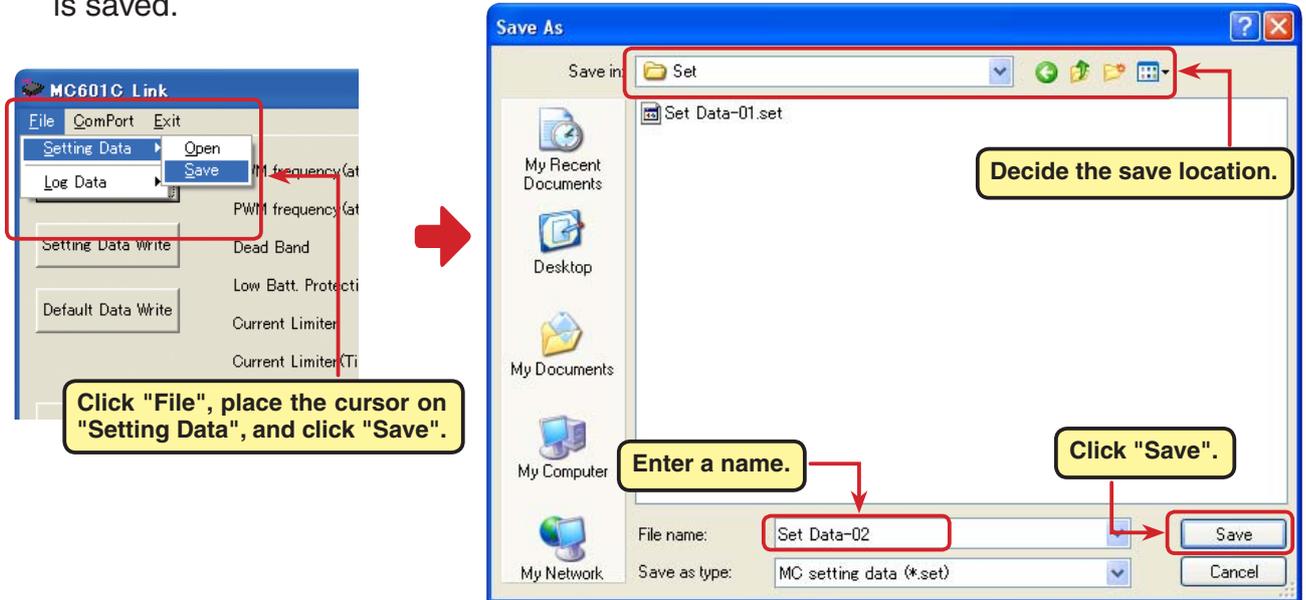
### * Reading saved data

Setting data saved to a computer can be read and displayed in the MC601C Link program startup window and written to the MC601C.

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 MC601C Link program startup window.

To write this data directly to the MC601C, see "Writing setting data to MC601C" on Page 18.

Click "File" and place the cursor on "Setting Data" and then click "Open".

Select the save location.

Click the read data.

Click "Open".
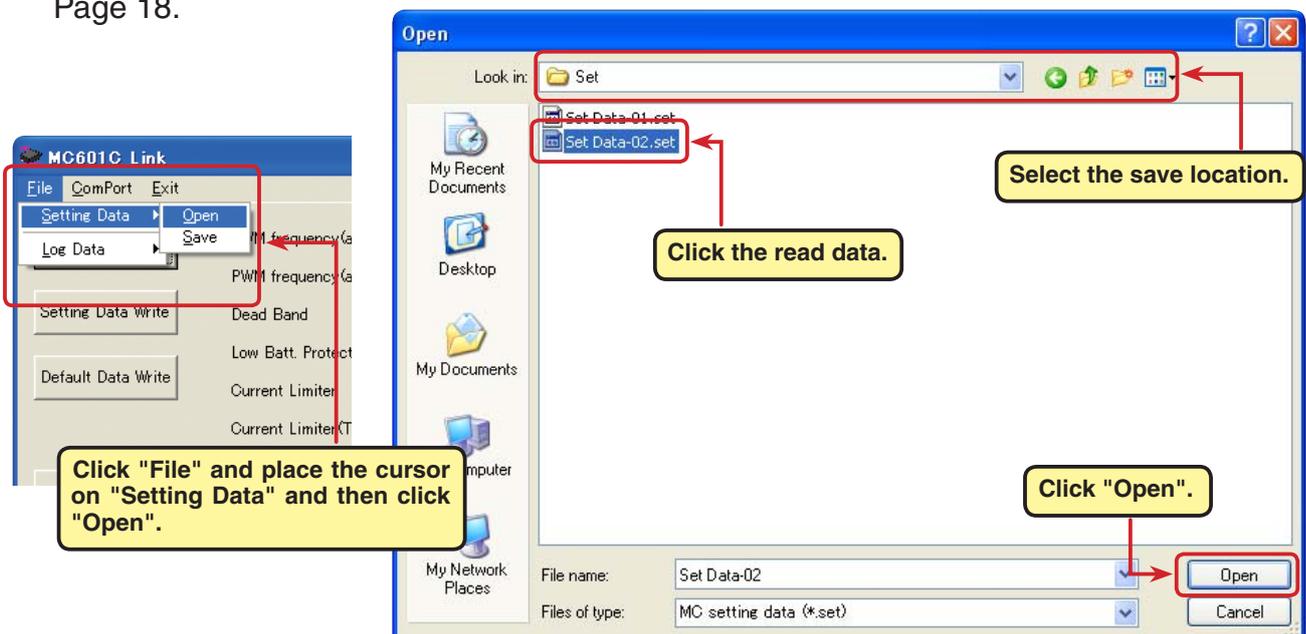
Initializing the MC601C

This function returns the MC601C 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 MC601C to a CIU-2 and connect the batteries to the MC601C.

Set the MC601C power switch to ON.

2. Click the "Default Data Write" button.
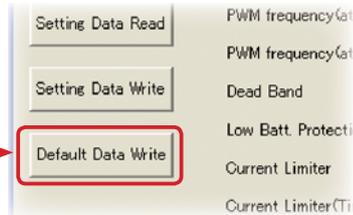
Click the "Default Data Write" button.

"Default Data Write" is displayed in the Message box and the access lamp (Busy) blinks green.
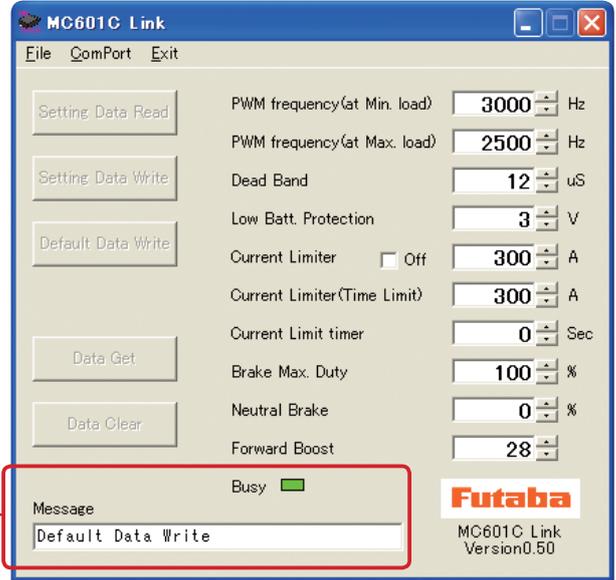
3. The factory setting data is written to the MC601C and the MC601C is initialized.

When writing of the setting data ends normally, "Completion" is displayed.
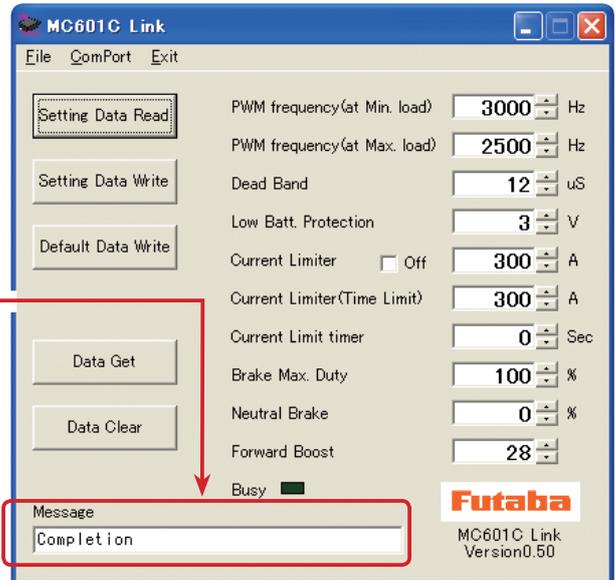
*Note:
When "MC cannot be set." shown at the right is displayed when the "Default Data Write" button is clicked, click the "OK" button and check for the following:
*Batteries are not connected to the MC601C.
*MC601C power is OFF.
*MC601C is faulty.
When "MC cannot be set." is displayed in the Message box when the "OK" button is clicked, the MC601C could not be initialized normally.
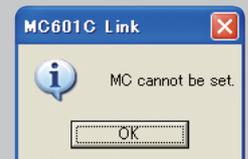
"MC cannot be set." is displayed in the Message box to show that the MC850C could not be initialized normally.
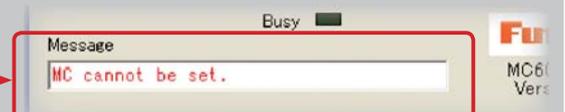
Messages List

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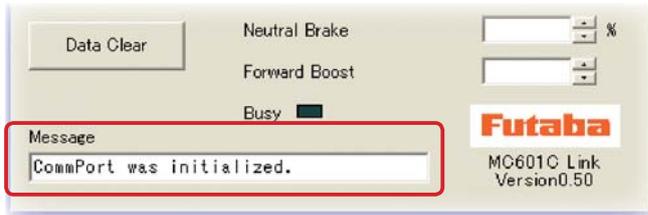
"ComPort was initialized."

Shows the COM port setting state. (Displayed when MC601C Link program starts.)

Since the COM port is set even if the wrong COM number is set, this message is displayed. However, when the MC601C tries to communicate with the CIU-2, "RS232 communication fault" is displayed, and communication with the CIU-2 becomes impossible.

"ComPort cannot be opened."

COM number is not set.

Select the correct COM number from the ComPort menu. (See Page 7.)

"Data Get"

Displayed while the log data recorded by the MC601C is being read. (See Page 9.)

"Data Clear"

Displayed while the log data recorded by the MC601C is being cleared. (See Page 12.)

"Setting Data Read"

Displayed while the setting data set at the MC601C is being read. (See Page 13.)

"Setting Data Write"

Displayed while the set setting data is being written to the MC601C. (See Page 18.)

"Default Data Write"

Displayed while the MC601C is being initialized. (See Page 20.)

"Completion"

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

"MC cannot be set." or **"Verify was NG"**

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 12, 13, and 18.)
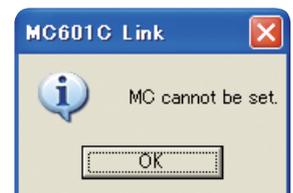
"RS232 communication fault."

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. 7.)

MC601C Link program removal (uninstall)

To remove (uninstall) the MC601C 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 "MC601C Link" and click the "Change/Remove" button.
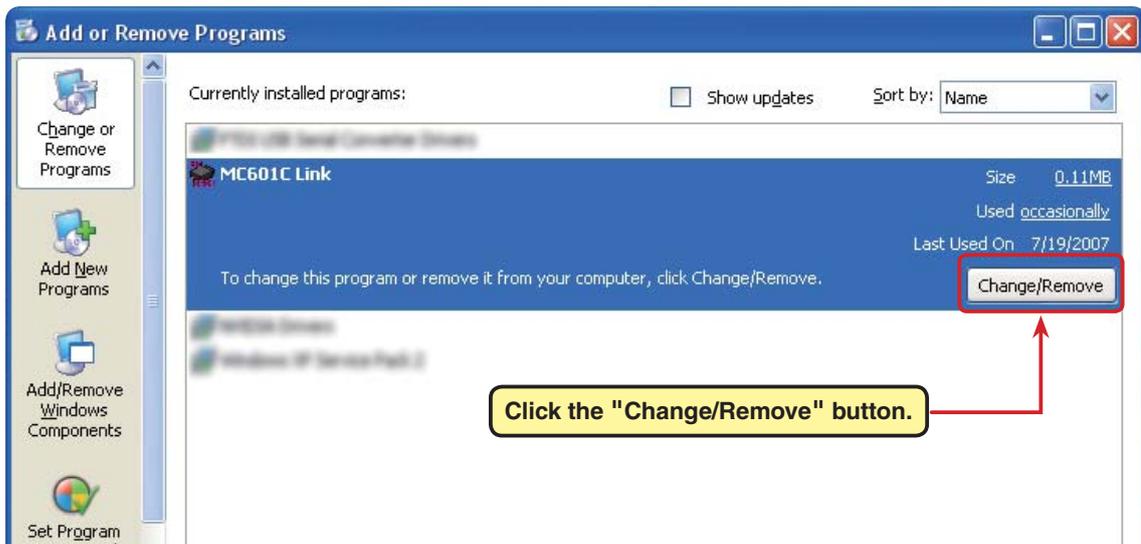
4. "Are you sure you want to completely remove MC601C Link and all of its components?" is displayed. Click the "Yes" button.
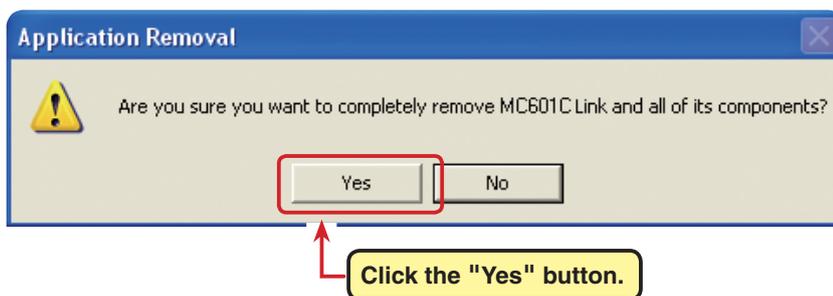
5. "Program installation removed" is displayed. Click the "OK" button. This completes removal (uninstall) of the MC601C Link program.