

DATA MASTER II



Operating Manual
Version 2.0

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1. PREFACE

1.1. GENERAL

You have made a good choice in selecting a KEMPPi product. Properly installed and used, Kemppi products prove to be productive machines requiring only a small amount of maintenance.

This manual gives you a thorough understanding of the equipment. Read the manual carefully through before installing, operating, or maintaining the equipment for the first time. Pay extra attention to the warnings and the Operation safety section and follow their instructions at all times.

For further information on Kemppi products please contact your nearest Kemppi distributor or Kemppi Oy.

The specifications and designs presented in this manual are subject to change without a prior notice.

1.2. PRODUCT INTRODUCTION

Kemppi DataMaster II is a general-purpose programming toolkit. It consists of the DataMaster II programming box, cables, battery charger and the PC Software.

1.2.1. *Memory function compatibility*

- The full range of functionality is available with MTM control panel.
- Works also with the MTL and MTX panels, but without the memory functions (only setup and panel setting can be set).

1.2.2. *Programming function compatibility*

- Kempact Pulse: Power Source/Panel.
- Kempact Automotive: Power Source/Panel.
- MasterTig ACDC MLS: Power Source/Panel.
- MasterTig MLS: Power Source/Panel.
- Pro.
- AC/DC.
- FastMig product family.
- WeldForce: Power Source/Panel.
- DataMaster I/II.



1.3. OPERATION SAFETY

Please read these safety instructions carefully and follow them when installing, operating, and servicing the machine.

Battery safety instructions

1. Do not dispose of the battery in a fire. The cell may explode. Dispose of batteries according to local regulations.
2. Do not open or mutilate the battery. Released electrolyte is corrosive and may cause damage to eyes or skin. May be toxic if swallowed.
3. Discard worn out battery as soon as possible. Worn out batteries are more likely to leak.
4. Do not store this product or its battery in high temperatures. If batteries are stored in a freezer or refrigerator in order to extend their shelf life, they should be stabilised in room temperature prior to use.

2. INSTALLATION

2.1. UNPACKING THE PRODUCT

The product is transported in a durable, recyclable package. After unpacking, you should check the contents to make sure that nothing has been damaged during the transportation.

Make also sure that the delivery corresponds to your order and that the delivery contains all the necessary instructions for installing and operating the equipment.

2.2. OPERATING ENVIRONMENT

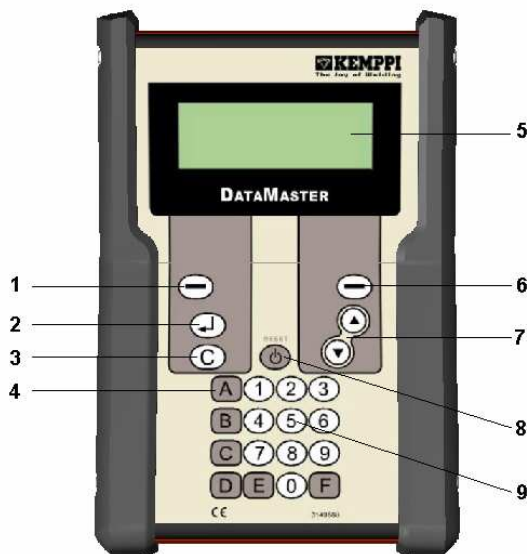
When using the DataMaster II toolkit, do not expose the device to rain and direct sunshine.

2.3. SERIAL NUMBER

The serial number of the device is marked on the product plate. The serial number is used to identify the parts of a specific product. It is important to know the serial number of the device when ordering repair service or spare parts for the product.

2.4. INSTALLATION AND MAIN PARTS

2.4.1. DataMaster II keypad



1. Left selection key.
2. Enter key (alternative select/start key).
3. Cancel/backspace key.
Long press moves to the beginning of a menu.
4. A-F special function keys.
5. LCD display.
6. Right selection key.
7. Up and down arrow keys.
8. ON/OFF key and RESET key.
9. Standard number keypad.

2.5. CABLE CONNECTIONS

2.5.1. DataMaster II connectors



- RS-232 PC connector.
- DC 12V power connector (12V 600mA).
- PRO/CAN bus connector
- ISP/SCI connector.
- USB connector for PC.

PRO/CAN connector

To PRO/CAN connector you can connect e.g. the following machines:

- FastMig™ Synergic
- FastMig™ Basic
- Pro and Pro Evolution products
- WeldForce™ Power source

ISP/SCI connector

To ISP/SCI connector you can connect e.g. the following machines:

- MasterTig 2300 ACDC
- MasterTig MLS™ 2000, 3000,4000
- Master MLS™ 1600, 2500, 3500
- Kempact Pulse 3000, 2800
- MinarcTig™
- MasterTig 2000, 2500, 3500 AC/DC (with adapter #4302380)
- DataMaster, DataMaster II
- WeldForce™ Panel's

2.5.2. Renesas programming connection

A 10-pin flat cable connector should be used when programming welding machines using a Renesas microcontroller.

2.5.3. MasterTig MLS programming connection

MLS must be connected to panel or power source by using 10-pin flat cable.

2.5.4. MasterTig MLS calibration connection

The same 10-pin connector can be used also for programming and calibration.

2.5.5. Mastertig AC/DC programming connection

A 10-pin flat cable connector with AC/DC adapter should be used when updating an AC/DC machine.

Adapter number: 4302380

2.5.6. PRO connection

A PRO/CAN cable with a PRO/CAN connector should be used when updating the PRO program.

2.5.7. CAN connection

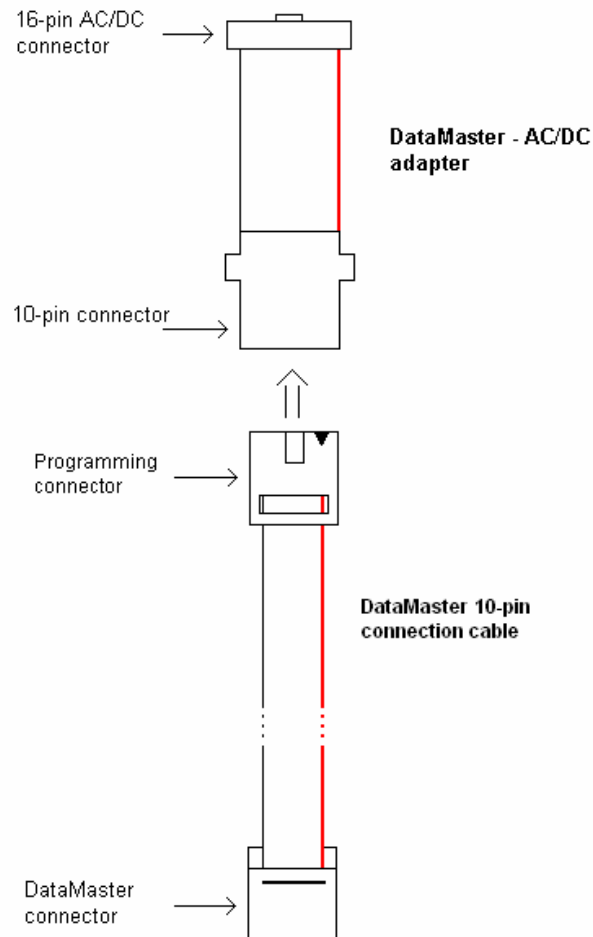
A PRO/CAN cable with a PRO/CAN connector should be used when updating the FastMIG program.

A 10/7-pin cable should be used when updating a FastMig™ Basic machine.

Cable number: 4298790

2.5.8. AC/DC connection

When updating the AC/DC program the DataMaster II AC/DC adapter must be connected to a 10-pin flat cable according to the following picture. The adapter must be connected to AC/DC programming interface.



2.5.9. FastMig™ connection

The PRO/CAN cable with a DataMaster II PRO connector should be use when updating the FastMig™ program.

2.5.10. PC connection

The DataMaster II device can be connected to a standard PC via RS-232 or USB connection. For the USB connection you need a virtual COM port driver, but no driver is needed for the RS-232 connection. If both RS-232 and USB ports are connected in the PC, only the USB port will work.

2.6. INSTALLING THE SOFTWARE

2.6.1. Installing the DataMaster II PC software

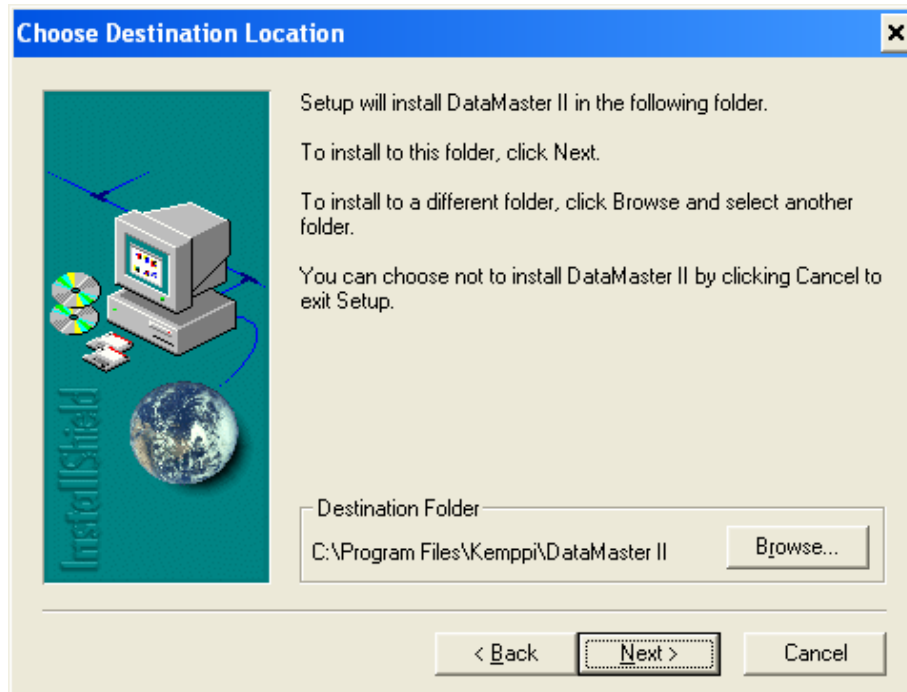
1. Insert the DataMaster II CD in your computer's CD-ROM drive.

The opening screen is displayed. If it doesn't appear, open the CD-ROM folder on your computer and double-click the **Install.exe** file.



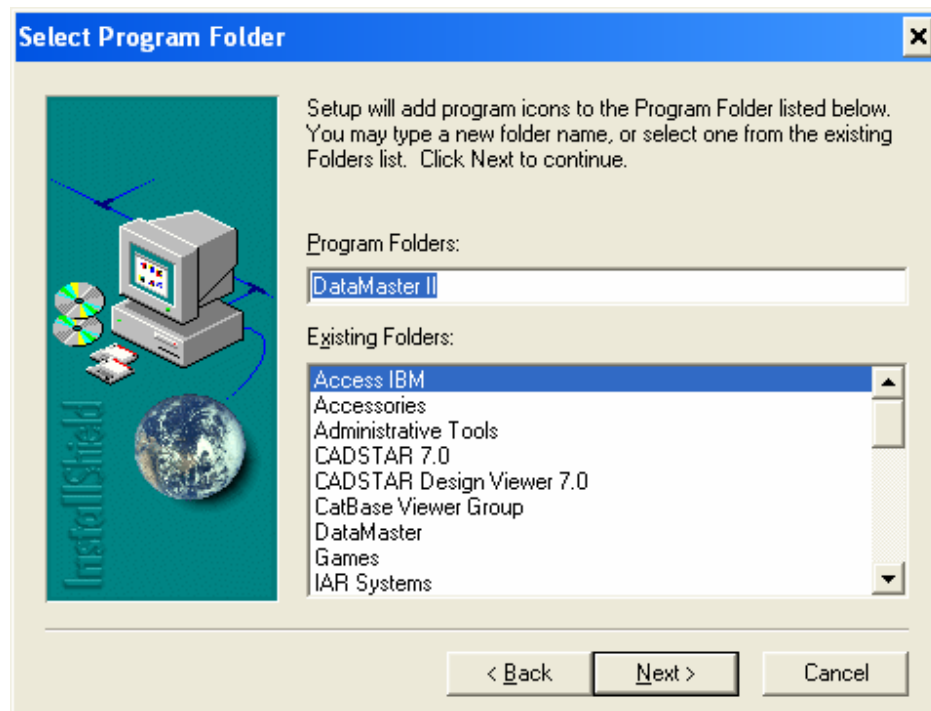
2. Click **Install PC Software** on the opening screen to start the installation of DataMaster II PC software.

The **Choose Destination Location** dialog box is displayed.



3. Choose the destination folder for the DataMaster II software and click **Next**.

The **Select Program Folder** dialog box is displayed.



4. Select the program group for the DataMaster II program icon.

2.6.2. Installing the virtual COM port driver

The virtual COM port driver is needed when the USB port is used in DataMaster II. The USB port is shown as COM port in the PC. The virtual COM port driver is also compatible with other Kemppi products, such as DLI 6.

The virtual COM port driver can be also downloaded from the site <http://www.ftdichip.com/Drivers/VCP.htm> (device: FT232BM).

Windows 2000/XP:

1. Insert the DataMaster II CD in your computer's CD-ROM drive.
2. Click **Install USB Virtual COM Port Driver** option in the opening screen.
3. Restart the computer.

Windows 98/ME:

1. Connect the DataMaster II to your computer and turn on the DataMaster II device. Windows detects a new device automatically.
2. Enter the path where the virtual COM port driver is located. The installation starts.
3. When the installation is complete, restart the computer. Now the DataMaster II COM port is displayed in the COM ports list with the first free port number.
4. DataMaster II will use the installed COM port number only in the USB port where it was connected during the driver installation. If you want to use another USB port, you need to do the installation again.

2.6.3. Uninstalling the virtual COM port driver

Virtual COM port driver can be uninstalled by using the FTDIUNIN.EXE program, which removes the virtual COM port driver automatically from the computer.

2.6.4. RS-232 port

No installation is needed when using the RS-232 port.

3. DATAMASTER II PC SOFTWARE

3.1. Supported file types

DataMaster II PC software supports the following file types:

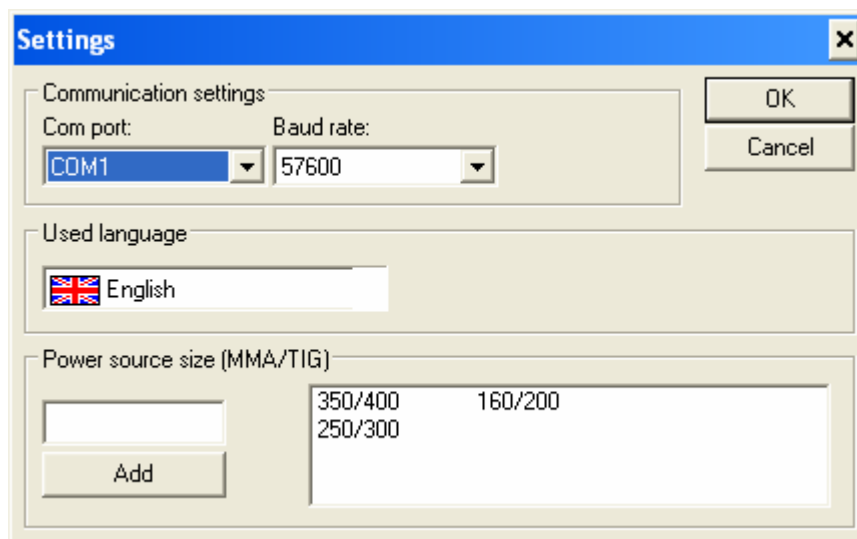
- MLS (ST7): *.HEX, *.S19 and *.BIN
- PRO (INTEL): *.HEX and *.BIN
- AC/DC (INTEL): *.BIN and *.HEX
- EEPROM (ST7) and setup function: *.MEM.
- Renesas (RENESAS): *.MOT and *.BIN.

3.2. Editing DataMaster II memory content

3.2.1. Starting the DataMaster PC software

When DataMaster PC software is started for the first time, the Settings dialog box is displayed where the user is asked to select the COM port, the communication speed (baud rate) and the language of the interface.

Decreasing the communication speed makes the communication more reliable, but the communication speed between PC and DataMaster II will be slower.



3.2.2. Reading the memory content

1. Start the DataMaster II PC software on your computer and turn on the DataMaster II device. The following screen is displayed.



2. Click **Device Program Management**.

DataMaster II will send the memory content to your computer, and following content list is displayed on your computer.



DataMaster II - [Device program management]

File View Window Help

DATA MASTER II **Device program management**

Read DataMaster Box Memory Content

Send Program

Receive Program

Send Nr. Programming Limit

Erase Memory Block of DataMaster Box

Renesas

1. QA3 MinarcTIG 180
Unlimited programming times - 256 kB
2. (Empty)
256 kB
3. KMS,Synergic,Power source,QA3
1 programming times left - 256 kB
4. QA4 Kempact Panel
Unlimited programming times - 256 kB
5. QA3 Master ACDC TIG
Unlimited programming times - 256 kB
6. KM,Basic,Panel,QA3
Unlimited programming times - 256 kB
7. QA3 KWF PANEL
90 programming times left - 256 kB
8. (Empty)
128 kB
9. (Empty)
128 kB
10. (Empty)
128 kB
11. (Empty)
128 kB
12. (Empty)
128 kB
13. (Empty)
128 kB

Intel / PRO/WeldForce Power Source

1. (Empty)
32 kB
2. (Empty)
32 kB
3. ## 4268250C8 PRO/MASTER A001 4261430/4271790 proSELLU OCV 07.01.2002
Unlimited programming times - 32 kB
4. (Empty)
32 kB
5. (Empty)
32 kB
6. (Empty)
32 kB
7. (Empty)
32 kB

Intel / Mastertig AC/DC

1. (Empty)
32 kB
2. ## 4283180C3 AC/DC A001 FLASH 09.08.2002
Unlimited programming times - 32 kB
3. (Empty)
32 kB
4. (Empty)
32 kB
5. (Empty)
32 kB

ST7 / Mastertig MLS

1. TIG Panel 0b0
Unlimited programming times - 16 kB
2. MLS Power 017
Unlimited programming times - 16 kB
3. (Empty)
16 kB
4. (Empty)
16 kB
5. (Empty)
16 kB

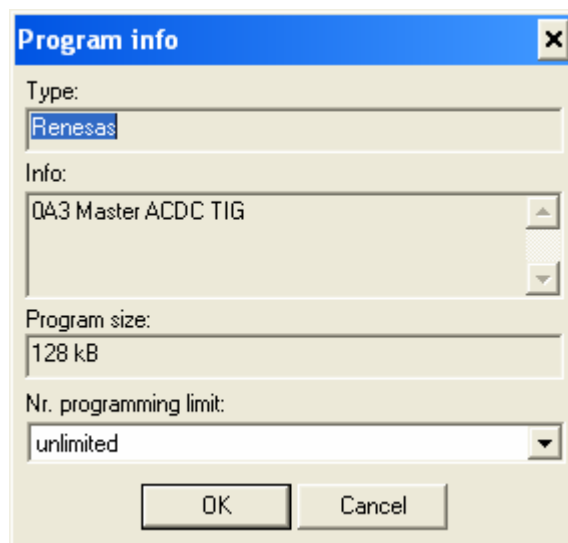
Ready NUM

3.3. Sending data from PC to DataMaster II

3.3.1. Sending program code to DataMaster II

After reading the memory contents from DataMaster II to your PC you must select the memory block to be used.

Click **Send Program** option in the content list and then select the program you want to send to DataMaster II. When you have made the selection, the **Program info** dialog box for that program is displayed.



Dialog fields:

Type:

This field shows the type of the selected program. The type of program tells which machines can use it.

Info:

This field shows more information about the program.

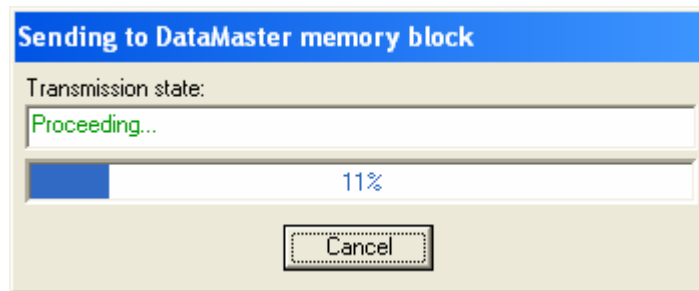
Program size:

This field shows the program size. PC program also check that selected program current size to selected memory block. If the size is incorrect the PC program will give error message.

Nr. programming limit:

In this field user can define, how many times the selected program can be transferred from DataMaster II to a welding machine. If 'unlimited' is selected, there is no limit. If '1' is selected, the program can be transferred only once to a welding machine.

When OK key is pressed, the transfer of the program from the PC to the DataMaster II memory begins, and a dialog box appears showing the progression of the transfer process.

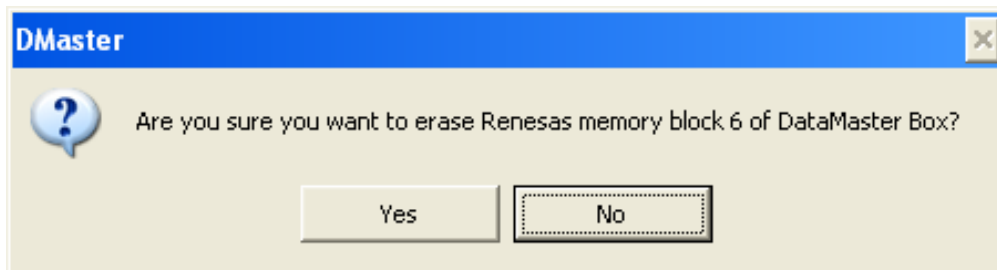


During the transmission the message 'Receiving Data' is shown on the DataMaster II display.

3.3.2. Erasing DataMaster memory block

Click **Erase memory block of DataMaster box** option in the content list to erase the selected memory block in DataMaster II device.

A confirmation dialog box appears. Select 'Yes' to continue the erasing of the memory block.

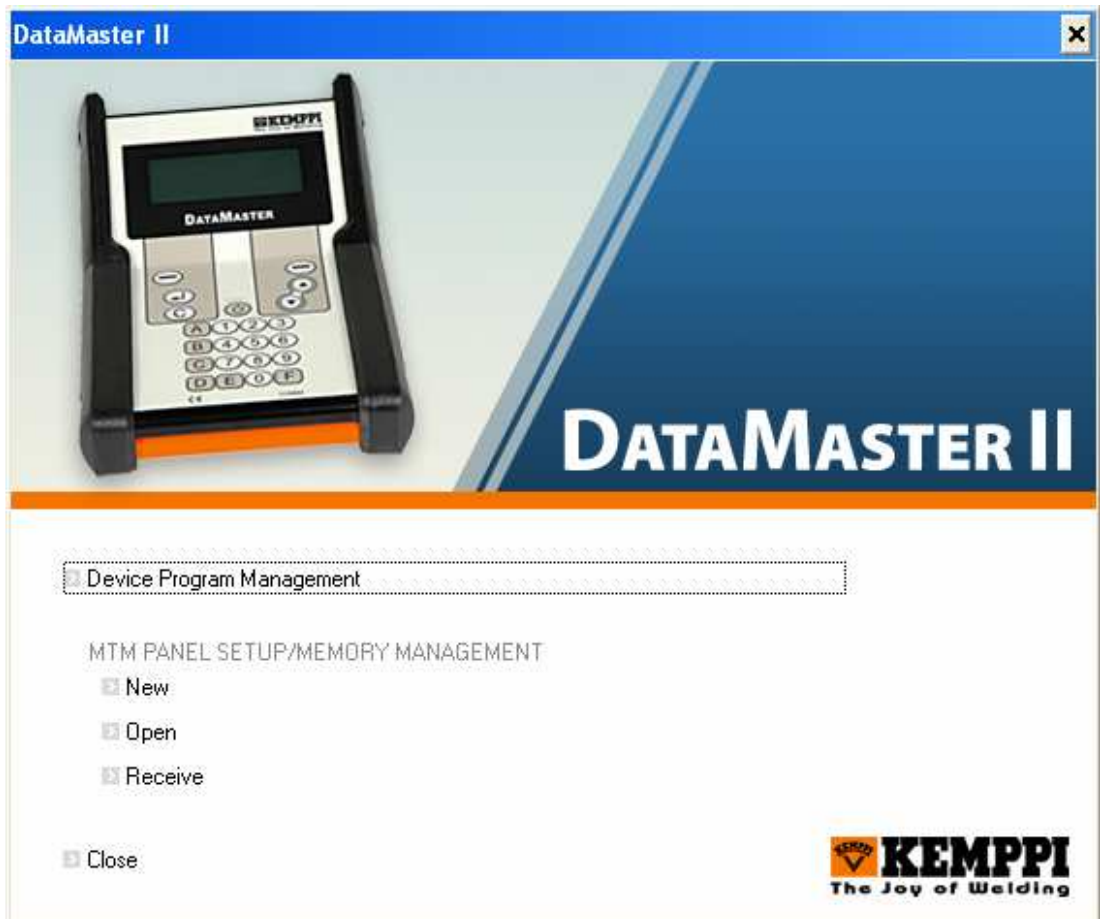


3.4. MASTERTIG MLS MEMORY FUNCTIONS

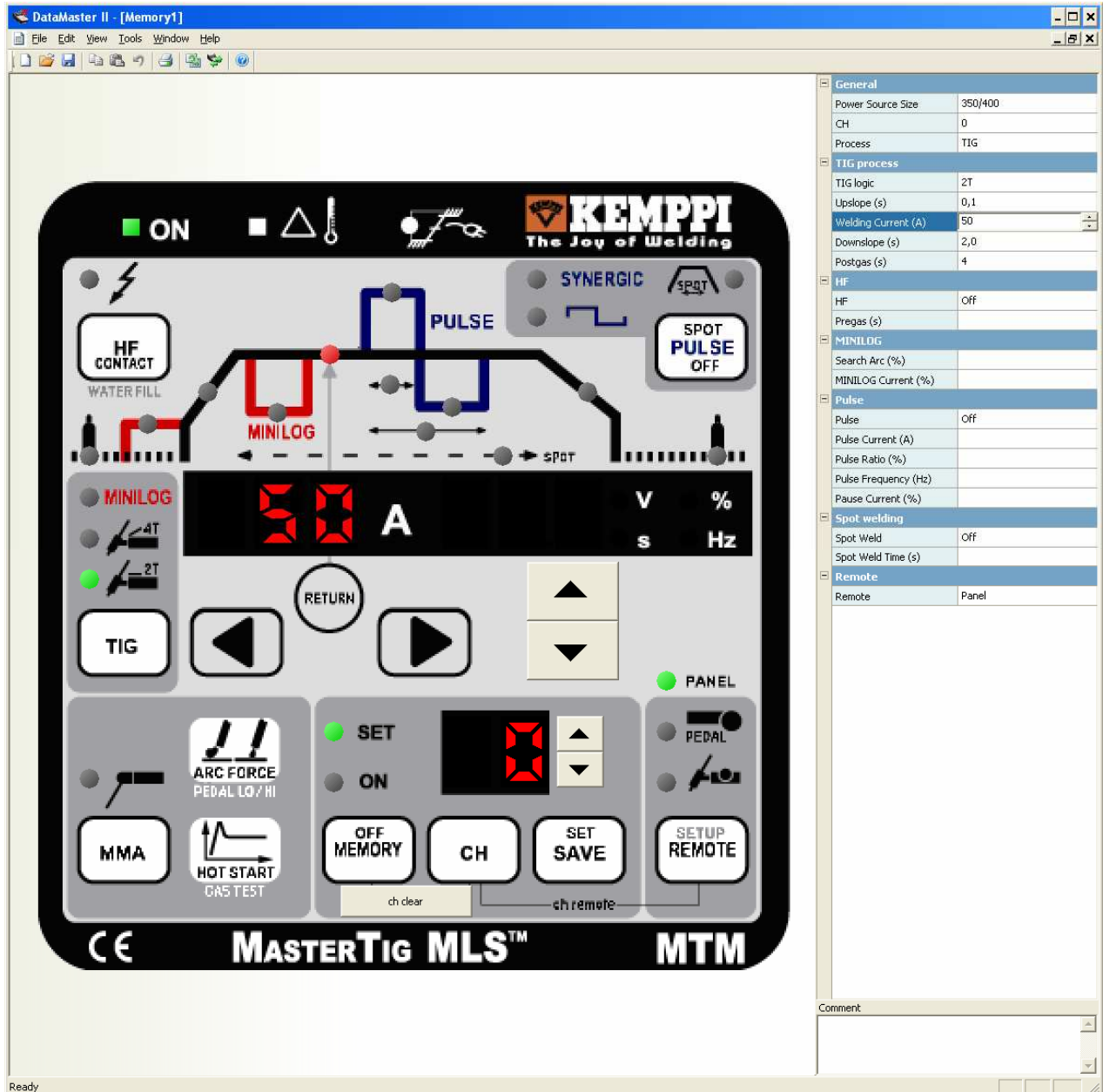
3.4.1. Setting MTM panel memory channels on your PC

Panel memory settings and setup settings are always transmitted together. This prevents conflicts between memory and setup.

1. In **MTM PANEL SETUP/MEMORY MANAGEMENT** select one of the following:
 - Select **New** if you want to define a new set of memory values.
 - Select **Receive** if you want to load memory settings from DataMaster II or the control panel.
 - Select **Open** if you want to load memory settings from a file on your PC.



The following control panel simulation screen appears on your PC for you to define the memory values.

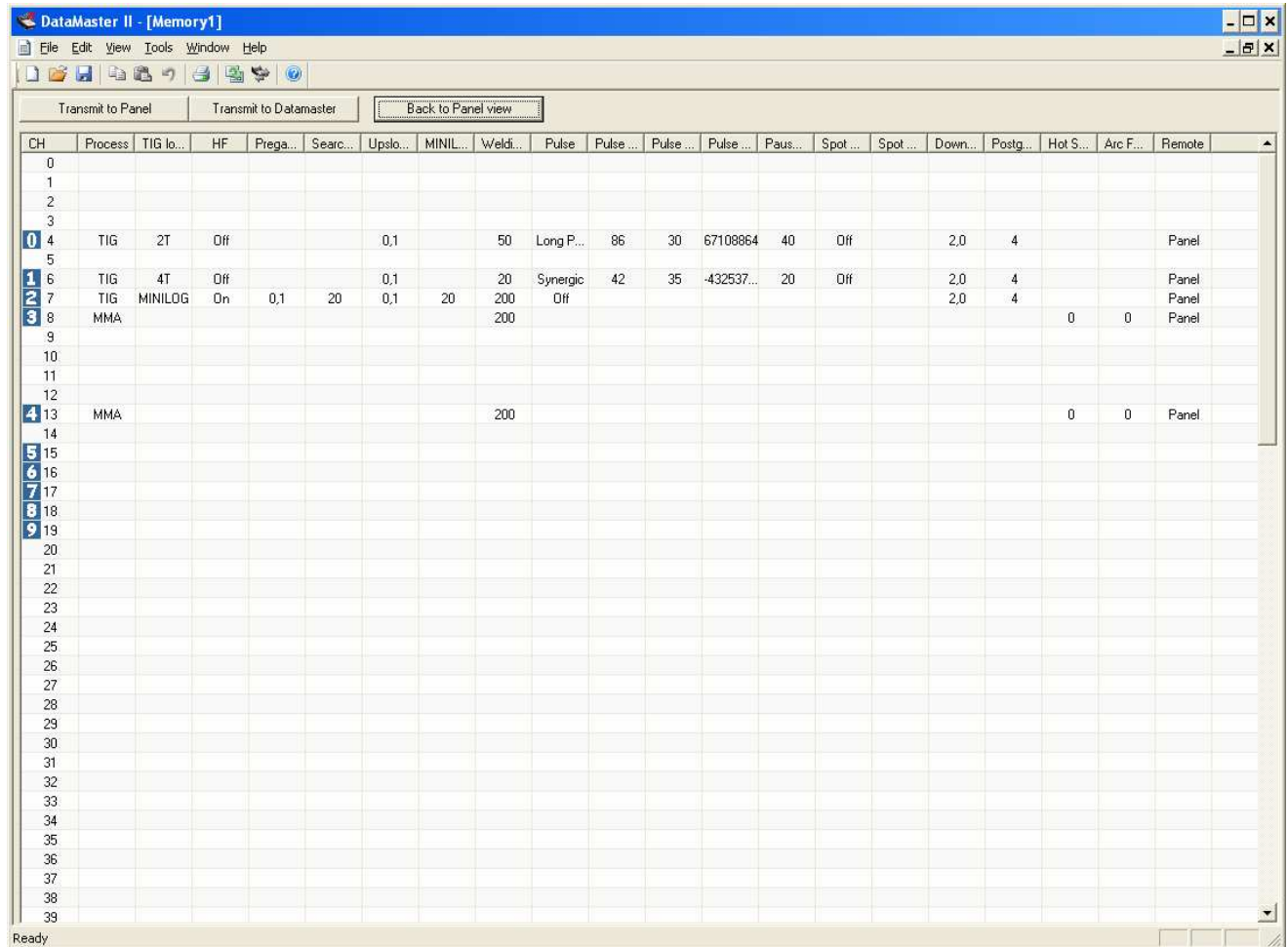


2. You can set the panel values directly to the panel simulation screen, or you can set the values by typing them into the fields on the right pane of the screen.
3. When the correct values have been set, select the desired memory channel number and press **SAVE** key in the panel simulation. This does not save the values to your PC. To save the values to your PC you must choose **File > Save**.

3.4.2. Transmitting memory and setup values to DataMaster II or panel

1. Select **Tools > Transmit**.

The following memory selection table appears.



CH	Process	TIG lo...	HF	Prega...	Searc...	Upslo...	MINIL...	Weldi...	Pulse	Pulse...	Pulse...	Pulse...	Paus...	Spot...	Spot...	Down...	Postg...	Hot S...	Arc F...	Remote
0																				
1																				
2																				
3																				
4	TIG	2T	Off			0,1		50	Long P...	86	30	67108864	40	Off	2,0	4			Panel	
5																				
6	TIG	4T	Off			0,1		20	Synergic	42	35	-432537...	20	Off	2,0	4			Panel	
7	TIG	MINILOG	On	0,1	20	0,1	20	200	Off						2,0	4			Panel	
8	MMA							200									0	0	Panel	
9																				
10																				
11																				
12																				
13	MMA							200									0	0	Panel	
14																				
15																				
16																				
17																				
18																				
19																				
20																				
21																				
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37																				
38																				
39																				

2. Select 10 memory channels to be transmitted to the DataMaster II device or to the control panel. You can select any of the 100 channels, also empty ones. The red number in CH column shows the corresponding number in panel memory.
3. Select **Transmit to DataMaster II**, if you want to send the values to DataMaster II, or select **Transmit to Panel**, if you want to send the values directly to the welding machine's control panel.

3.5. MASTERTIG MLS SETUP FUNCTIONS

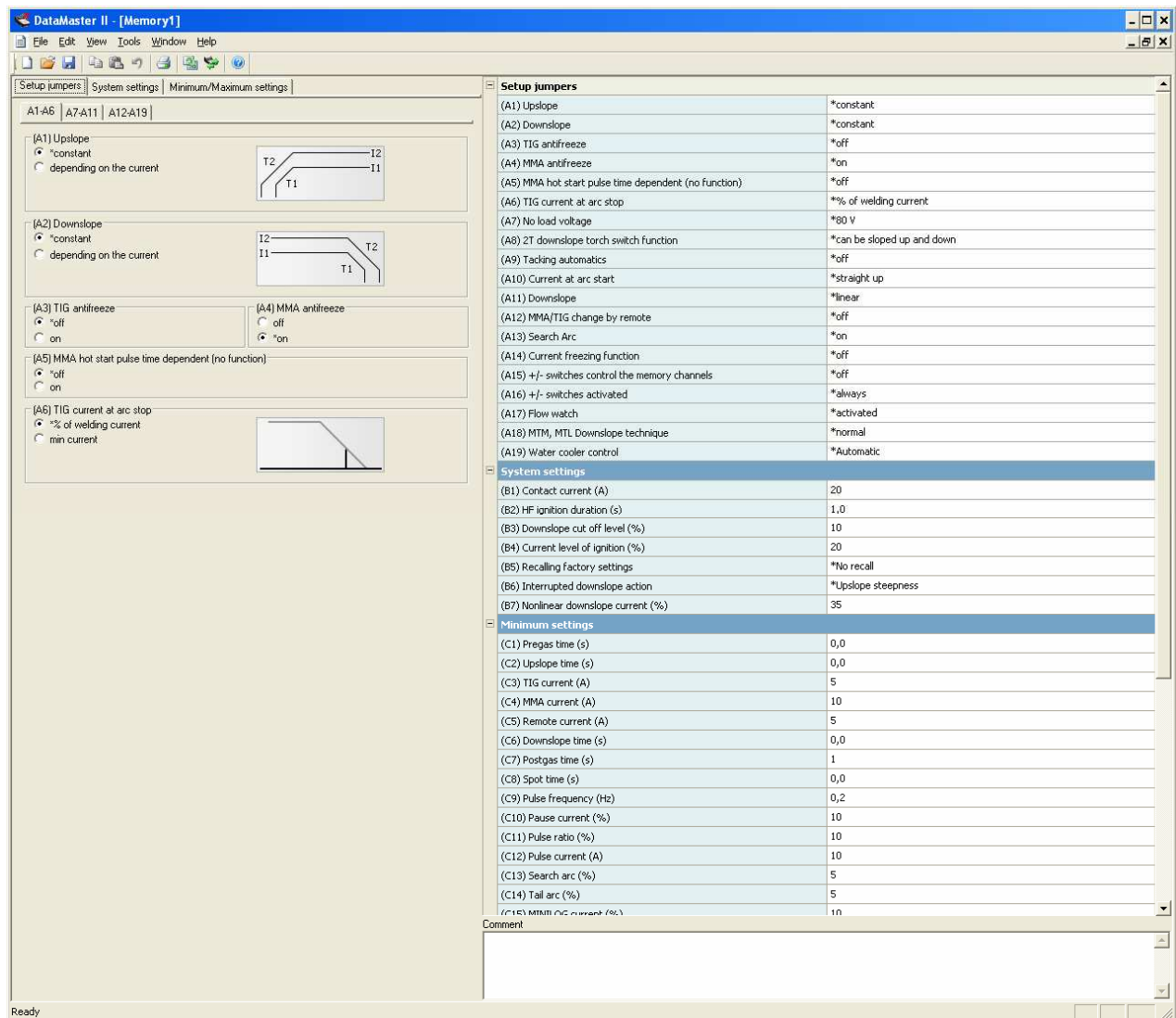
Panel memory settings and setup settings are always transmitted together. This prevents conflicts between the memory and setup

3.5.1. Setting up the MTM panel Setup values on your PC

1. In **MTM PANEL SETUP/MEMORY MANAGEMENT** select one of the following:
 - Select **New** if you want to define a new set of setup values.
 - Select **Receive** if you want to load setup values from DataMaster II or the control panel.
 - Select **Open** if you want to load setup values from a file on your PC.



The following setup view appears on your PC for you to define the setup values.



2. Select **View > Setup view**, and the first list of setup jumpers is displayed on the screen.
 - Right pane shows all the MTM panel jumper settings.
 - Left pane shows more detailed information about the jumper settings.
 - Jumper settings and values can be modified in both panes.
 - Left pane's contents change as you click different tabs.

On **Setup jumpers** tab you can define jumper settings.

On **System settings** tab you can define system values.

On **Minimum/Maximum settings** tab you can set the adjustable panel value ranges.



3.5.2. Saving the memory and setup settings to PC

Select **File > Save As...** if you want to save all panel and memory values to a hard drive on your computer.

In Comment window you can write comments, which will also be saved to your PC's hard disk.

3.6. Printing MasterTIG MTM panel values

3.6.1. Printing the MTM panel values

This procedure prints the panel picture and a list of all panel values. Setup values will not be included.

1. Select the panel setting that you want to print.
2. Select **File > Print**.
3. Press **OK**.

3.6.2. Printing the setup values

This procedure prints all panel setup layer values.

1. Select **View > Setup View**.
2. Select **File > Print**.
3. Press **OK**.



4. USING THE DATAMASTER II

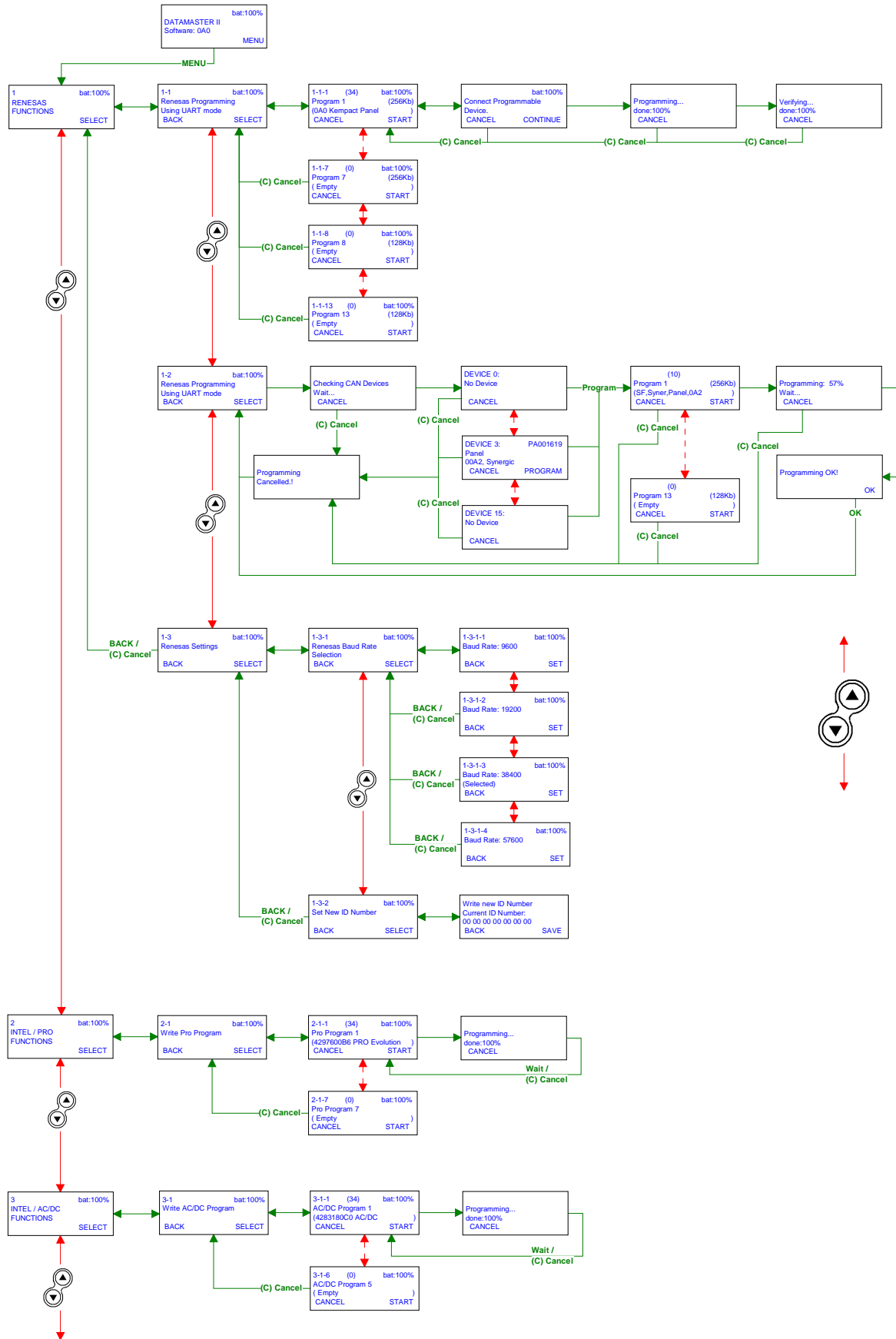
4.1. DATAMASTER II MENU

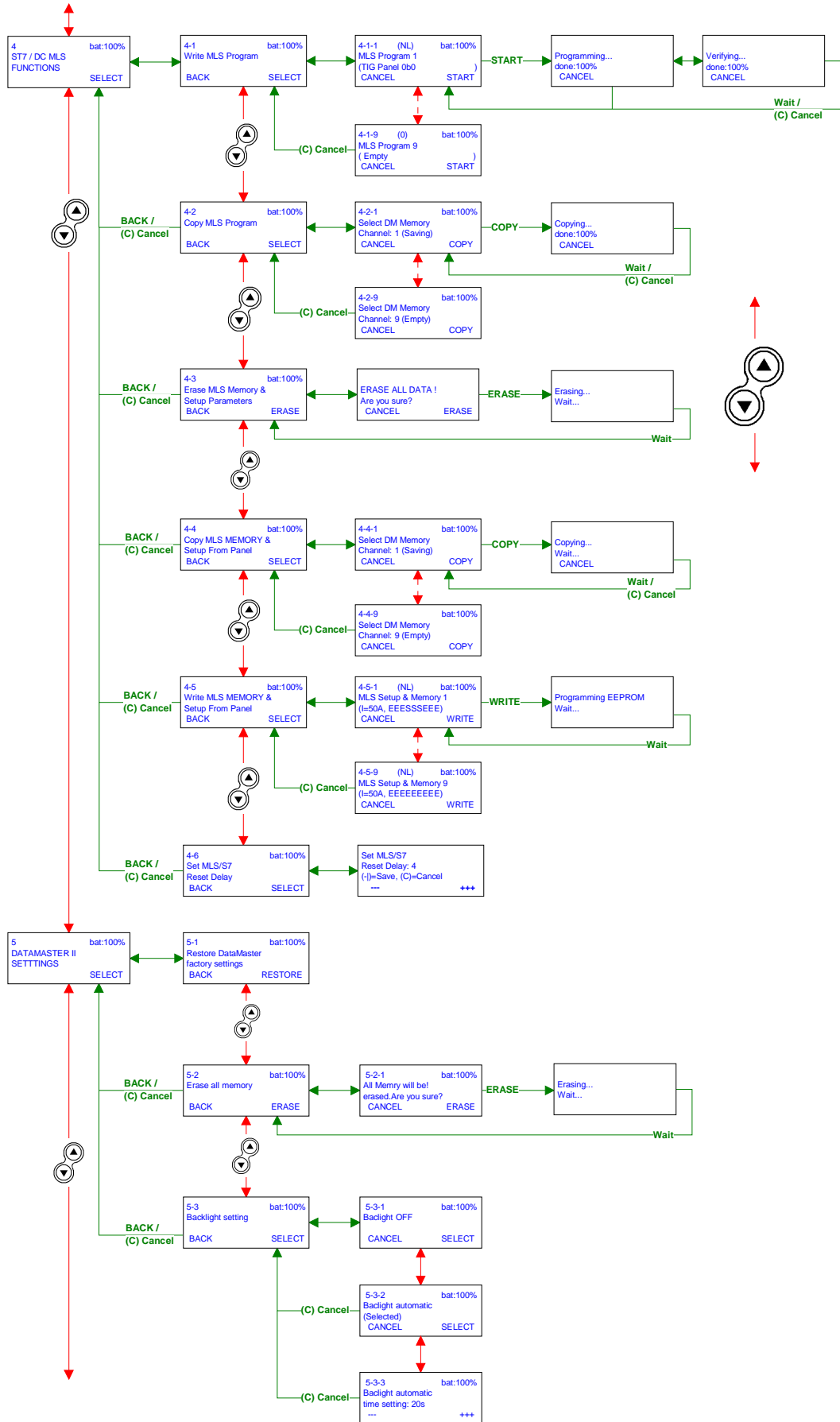
When DataMaster II device is turned on, DataMaster II version information appears on the display. The DataMaster II main menu appears, when you press Menu key.

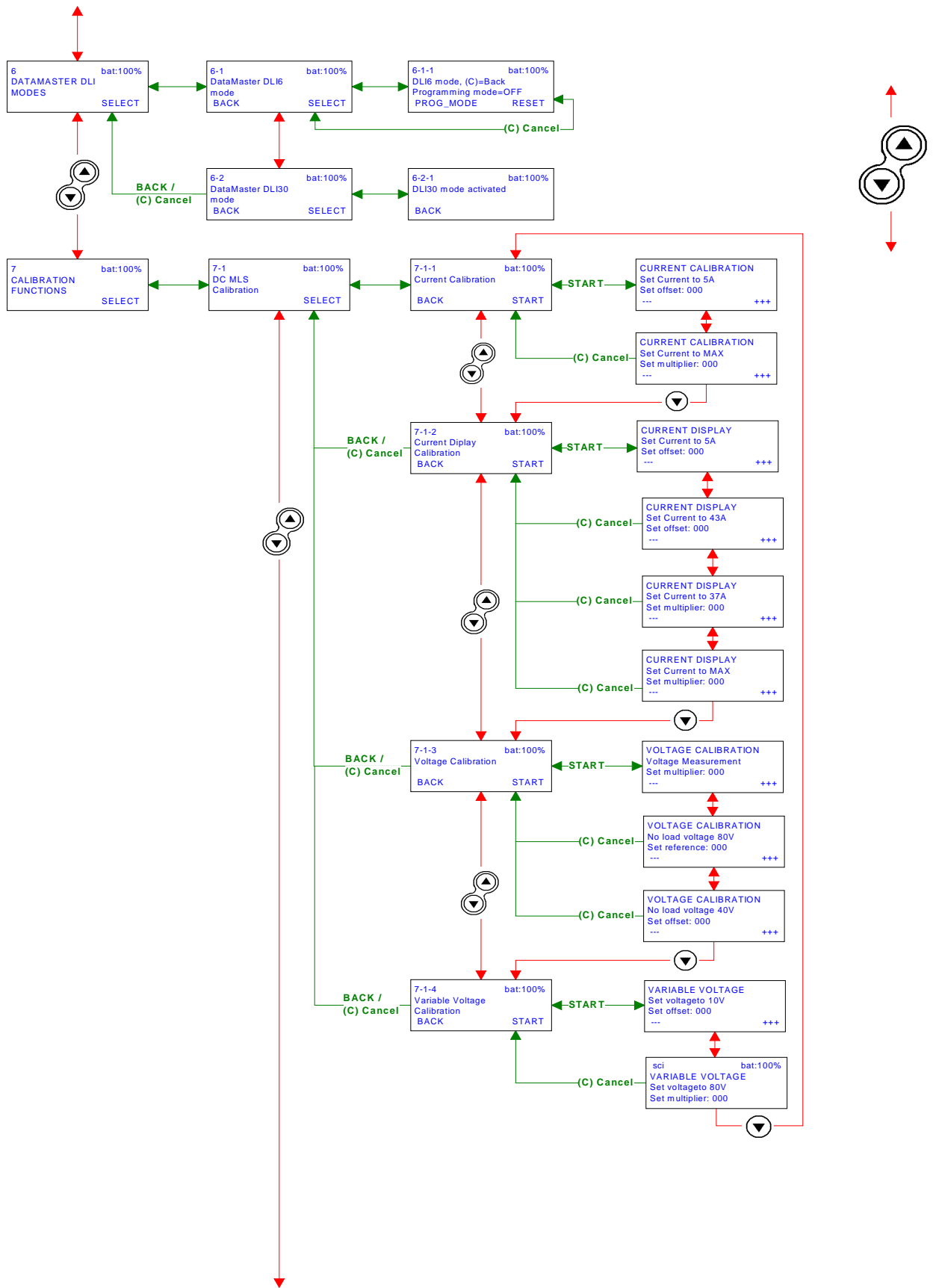
You can navigate in DataMaster II menus with up and down arrows and make selections with Select or Enter keys. Pressing Cancel or backspace a few times will take you back to the main menu.

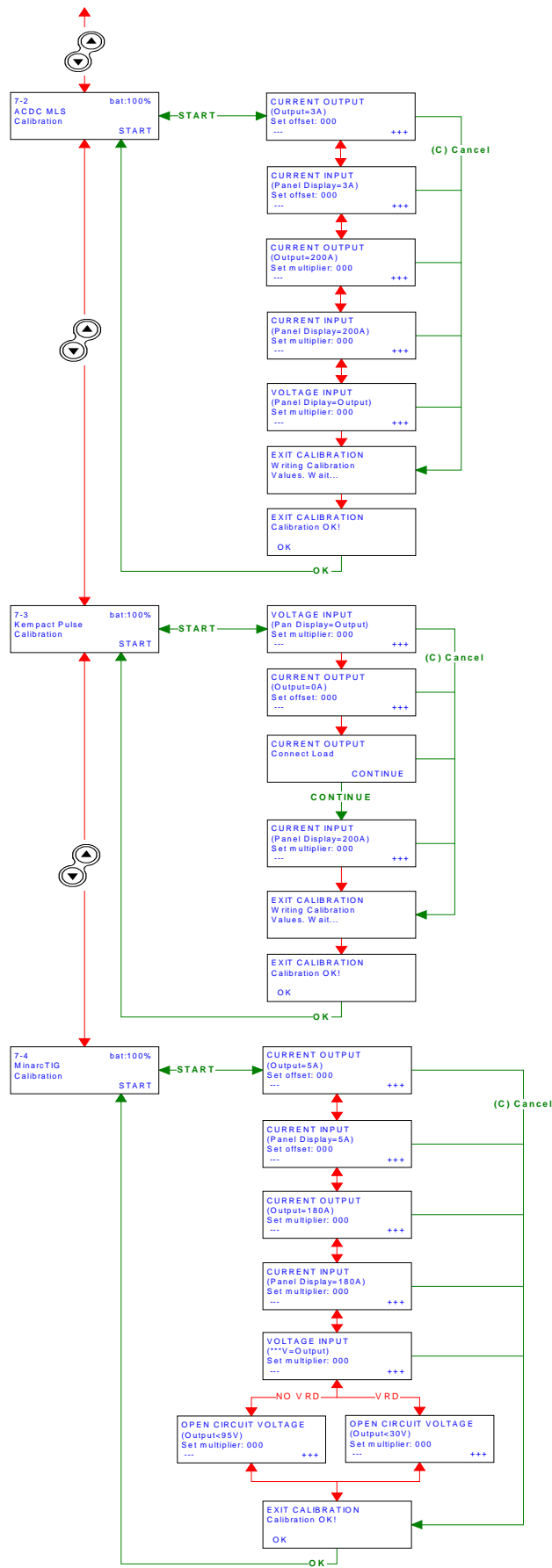
The arrow symbols appear on the display only if there are more functions in that menu.

4.1.1. DataMaster II menu map







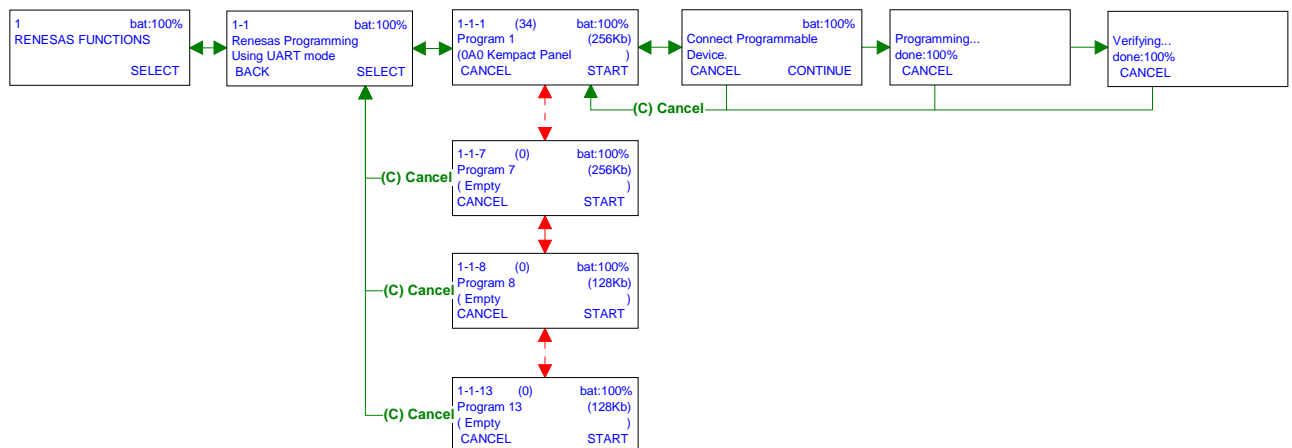


4.2. Renesas Functions

4.2.1. Program RENESAS flash memory using UART mode

The 10-pin flat cable must be used in UART programming mode. This programming mode can be used with many up-to-date Kemppti products, such as Kempact pulse, MasterTIG MLS ACDC.

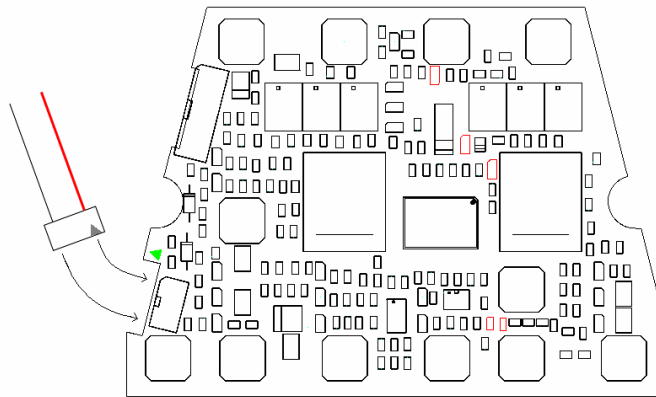
1. Start DataMaster II and press Menu.
2. Select **Renesas Programming using UART mode**.
3. Use the up and down arrows to choose the program you want of programs 1 to 13.
4. Press **START** on the DataMaster II keypad to start the updating process.
5. When DataMaster II display says: *Connect Programmable Device*, connect DataMaster II to welding machine and press **CONTINUE**.
6. When updating is in progress, the DataMaster II display shows the progression of the process as a percentage value. If the progression stops, reset the DataMaster II by pressing **ON/OFF** key for 3 seconds, and start again.



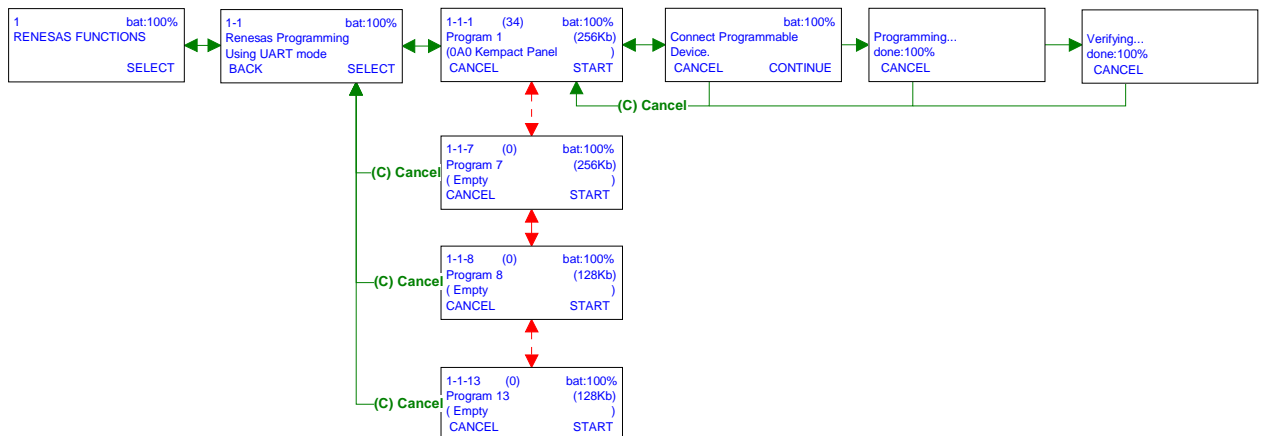
4.2.2. Programming WeldForce panels

The 10-pin flat cable must be used in WeldForce UART programming mode.

1. Turn the welding machine off.
Do not connect the DataMaster II to the WeldForce panel yet.
2. Start the DataMaster II and press **Menu**.
3. Select **Renesas Programming using UART mode**.
4. Use the up and down arrows to choose the WeldForce program you want of programs 1 to 13.
5. Press **START** on the DataMaster II keypad to start the updating process.
6. When DataMaster II display says: *Connect Programmable Device*, connect the DataMaster II to the WeldForce panel.
Note: All the panel's leds and displays should be off now. If they are on, reconnect the cable.



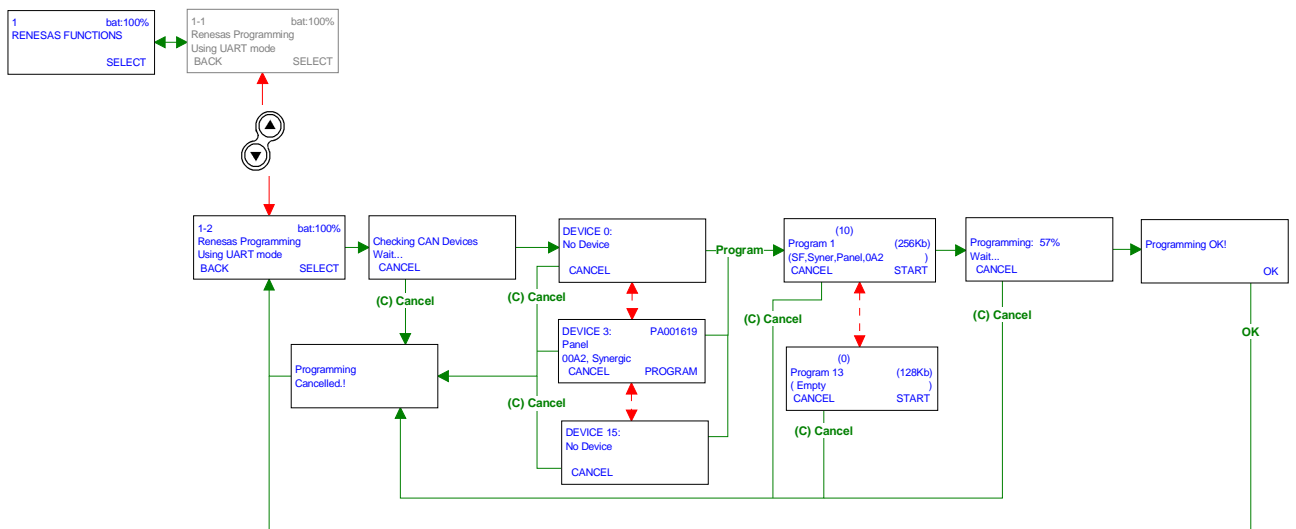
7. Turn the welding machine on (optional).
8. Press **CONTINUE** to start programming.
9. When updating is in progress, the DataMaster II display shows the progression of the process as a percentage value. In case of a programming error, press **START** again without reconnecting the cable. If the progression stops, reset the DataMaster II by pressing **ON/OFF** key for 3 seconds, and start again.



4.2.3. Programming RENESAS flash memory using CAN bus

The PRO/CAN cable must be used in CAN programming mode. This programming mode can be used with FastMIG products.

1. Start the DataMaster II and press **Menu**.
2. Select **Renesas Programming using CAN mode**.
3. DataMaster checks, which devices are connected to CAN bus.
4. Use the up and down arrows to choose the device to be programmed of devices 0 to 15 and press **PROGRAM**.
5. Use the up and down arrows to choose the program you want of programs 1 to 13.
6. Press **START** on the DataMaster II keypad to start the updating process.
7. When updating is in progress, the DataMaster II display shows the progression of the process as a percentage value. If the progression stops, reset the DataMaster II by pressing **ON/OFF** key for 3 seconds, and start again.



4.2.4. Renesas setting

4.2.3.1 Renesas baud rate selection

You can select one of the following baud rate (speed) values for the Renesas programming.

- 9600
- 19200
- 38400 (factory setting)
- 57600

Decreasing the baud rate makes the communication more reliable, but the programming time will be longer.

4.2.3.2 Setting a new ID number

A Renesas program needs an ID number that is compatible with the Renesas program (*not file). In some cases this ID number may have to be changed.

Factory setting: 00 00 00 00 00 00 00

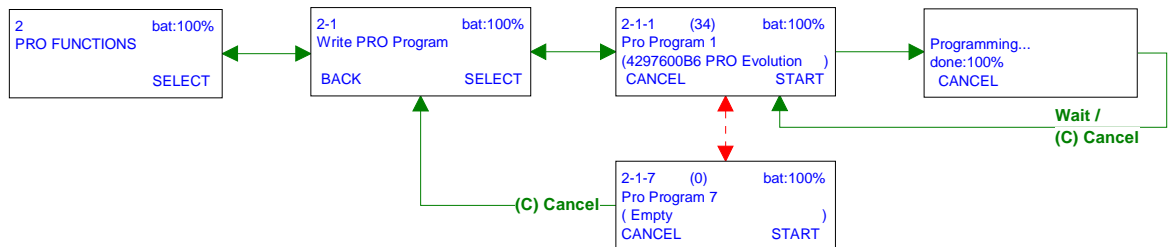
In case of an ID error, you must enter the correct ID number to DataMaster II device.

Sometimes in error situations the ID number may be: FF FF FF FF FF FF FF.

4.3. Intel/Pro functions

4.3.1. Writing a PRO program

1. Turn the DataMaster II device on and press **Menu**.
2. Select **PRO FUNCTIONS**.
3. Select **Write PRO Program**.
4. Use the up and down arrows to choose the program you want of PRO Programs 1 to 7.
5. Press **START** on the DataMaster II keypad to start the updating process.
6. When updating is in progress, the DataMaster II display shows the progression of the process as a percentage value. If the progression stops, reset the DataMaster II by pressing **ON/OFF** key for 3 seconds, and start again.



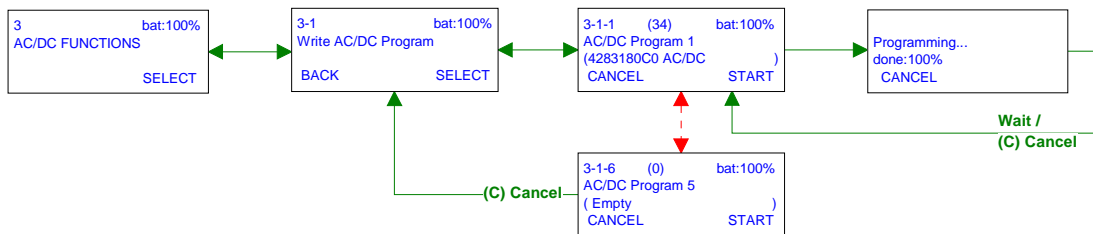
Note:

For Pro programming you need the PRO/CAN cable.

4.4. Intel/AC/DC functions

4.4.1. Writing an AC/DC program

1. Start the DataMaster II and press **Menu**.
2. Select **AC/DC FUNCTIONS**.
3. Select **Write AC/DC Program**.
4. Use the up and down arrows to choose the program you want of AC/DC Programs 1 to 5.
5. Press **START** on the DataMaster II keypad to start the updating process.
6. When updating is in progress, the DataMaster II display shows the progression of the process as a percentage value. If the progression stops, reset the DataMaster II by pressing **ON/OFF** key for 3 seconds, and start again.



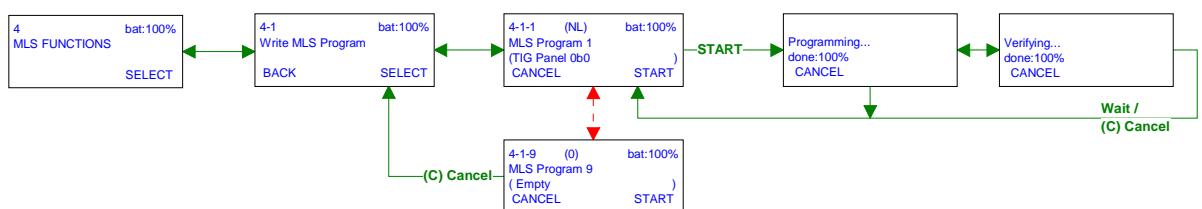
Note:

For AC/DC programming you need the DataMaster II-AC/DC adapter.

4.5. ST7/MLS Functions

4.5.1. Writing an MLS Program

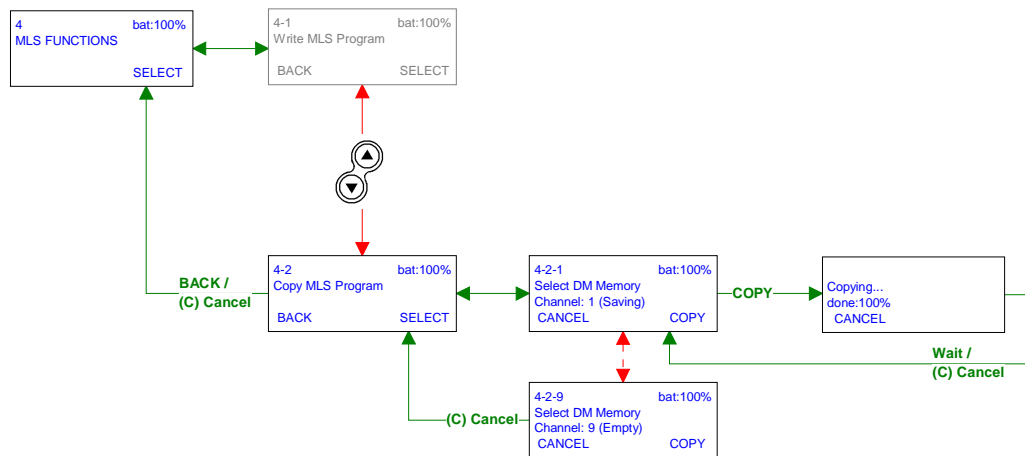
1. Start the DataMaster II and press **Menu**.
2. Select **MLS FUNCTIONS**.
3. Select **Write MLS Program**.
4. Use the up and down arrows to choose the program you want of MLS Programs 1 to 9.
5. Press **START** on the DataMaster II keypad to start the updating process.
7. When updating is in progress, the DataMaster II display shows the progression of the process as a percentage value. If the progression stops, reset the DataMaster II by pressing **ON/OFF** key for 3 seconds, and start again.



4.5.2. Copying MLS program from panel to DataMaster

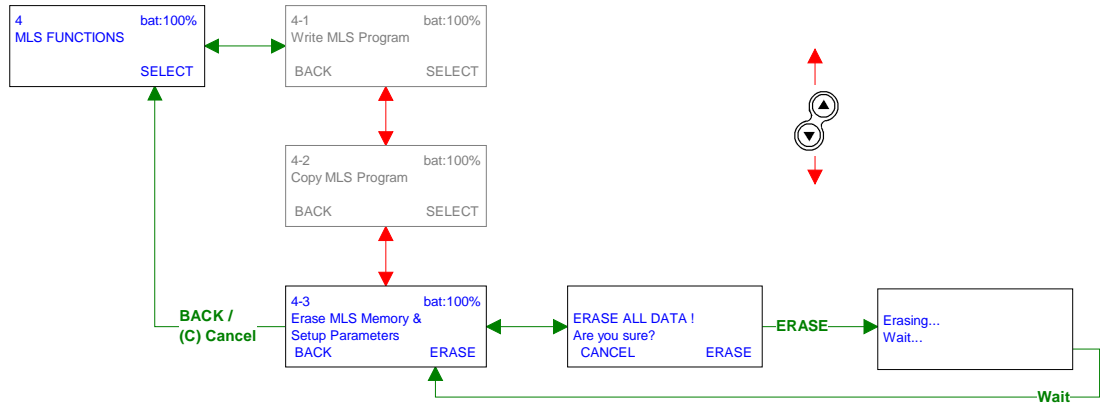
Only Master MLS panel program and power source program can be copied from the welding machine to the DataMaster II device.

4. Connect a 10-pin flat cable to the control panel or power source.
5. Select **MLS FUNCTIONS**.
6. Select **Copy MLS Program**.
7. Use the up and down arrows to choose the DataMaster II memory block you want of memory channels 1 to 9. Message 'Saving' on DataMaster's display tells that there is already data in that DataMaster memory block.
8. Press **COPY** to start copying the program.
9. When updating is in progress, the DataMaster II display shows the progression of the process as a percentage value. If the progression stops, reset the DataMaster II by pressing **ON/OFF** key for 3 seconds, and start again.
10. The copied program is now in DataMaster II memory, from where it and can be used for updating other welding machines.



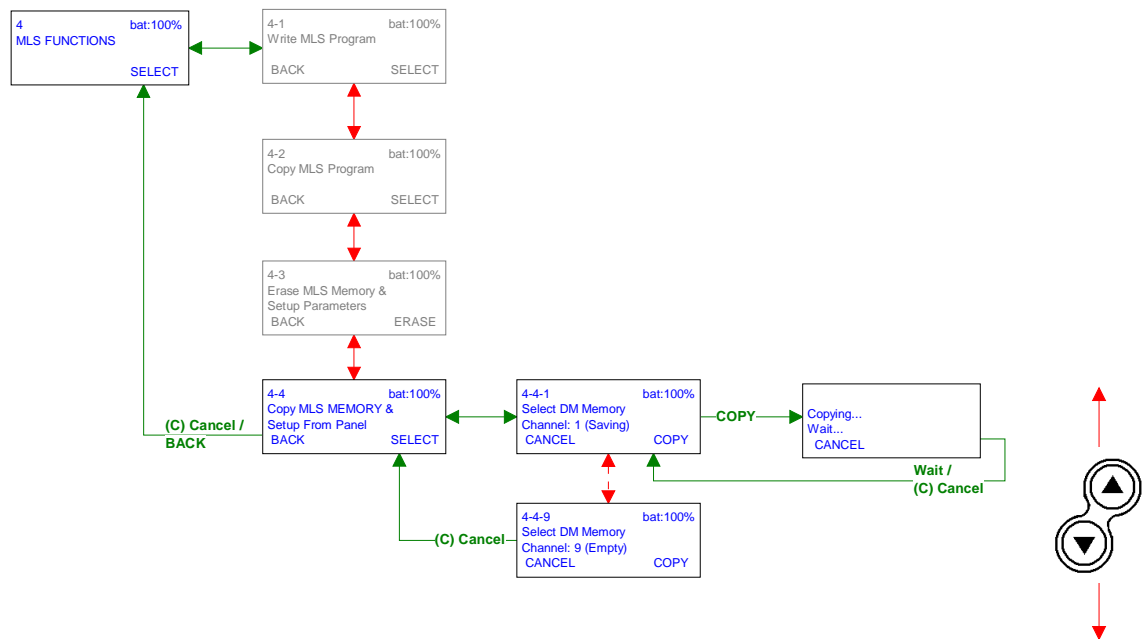
4.5.3. Erasing MLS memory and setup parameters

When you erase the MLS setup and memory settings, all values will be reset to factory settings and all memory channels will be empty.



You should use the erase function when updating old MasterTIG MLS panel software or when the panel software is not working correctly.

4.5.4. Copying MLS memory and setup from panel



1. Select **Copy MLS Memory & Setup from Panel**.
2. Select the DataMaster memory block where you want to save the current setup and memory values.
3. Press **COPY**, and DataMaster II reads the memory and setup values from the MLS Panel and saves it to DataMaster memory.
4. When updating is in progress, the DataMaster II display shows the progression of the process as a percentage value. If the progression stops, reset the DataMaster II by pressing **ON/OFF** key for 3 seconds, and start again.

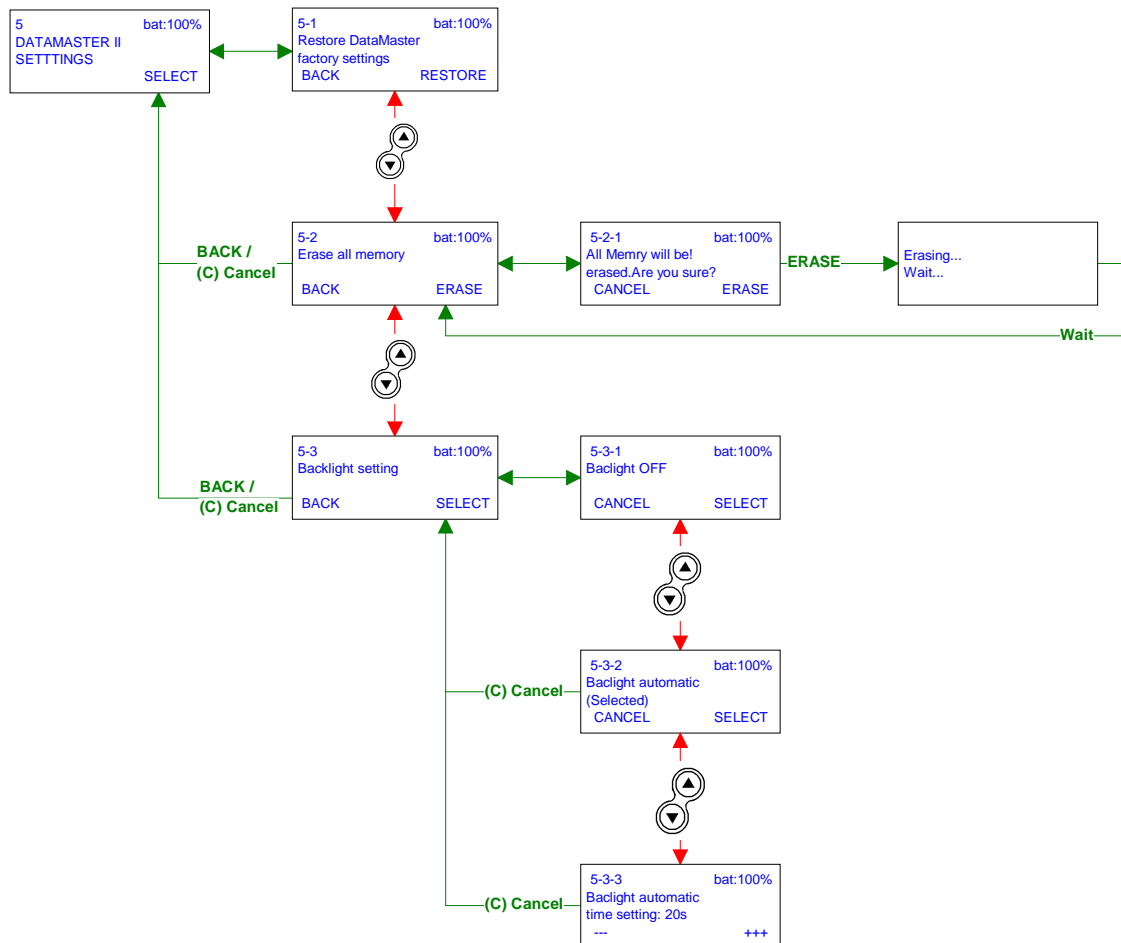
Note:

Message 'Saving' on DataMaster's display tells that there is already data in that DataMaster memory block.

4.5.6. Setting MLS/ST7 reset delay

The default value for reset delay is 4 microseconds, which is close to the correct delay. You may need to change the reset delay value in order to correct programming error situations. The value can be altered until the ISP programming communicates reliably.

4.6. DATAMASTER II SETTINGS



4.6.1. Restoring DataMaster factory setting

This will reset all DataMaster settings to factory settings, but it does not empty the memory channels.

4.6.2. Erase all memory

This will empty all DataMaster memory channels.



4.6.3. Backlight setting

Backlight OFF

When using this setting the backlight is always off.

Backlight automatic

When using this setting the backlight is on when any key is pressed.

Backlight automatic time setting

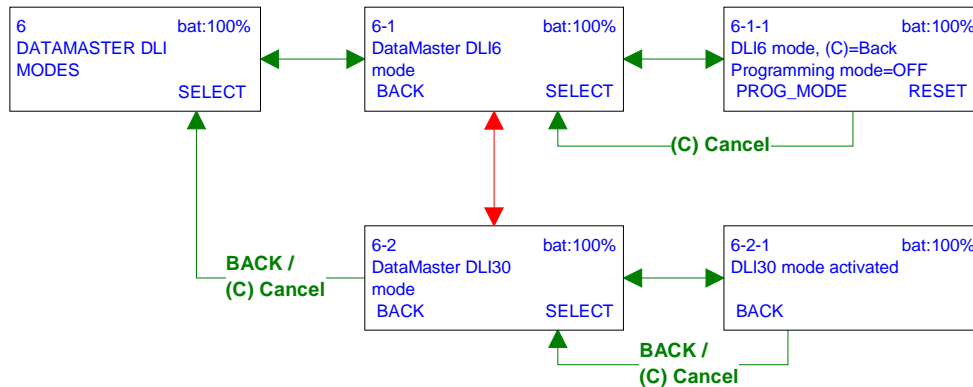
This option lets the user set the duration, how long backlight is on when a key is pressed in the automatic mode.

4.6.4. Backlight automatic time setting

The user can select the duration, how long the DataMaster backlight is on when a key is pressed.

- 5s
- 20s (factory setting)
- 40s
- 60s
- 90s

4.7. DataMaster II DLI modes



4.7.1. DLI 6 Mode

DataMaster works like a real DLI 6 device. When the DLI 6 mode is selected, it is not possible to use PC to DataMaster functions. You can exit DLI 6 mode by pressing **Cancel** or **Back** keys.

PROG_MODE key can be used to change the *Programming mode*. This key works the same way as the program switching function in DLI 6.

RESET key will reset the connected device (e.g. panel).

When *Programming mode=ON*, the device (e.g. panel) can be programmed by using FlashSta program on your computer.

4.7.2. DLI 30 Mode

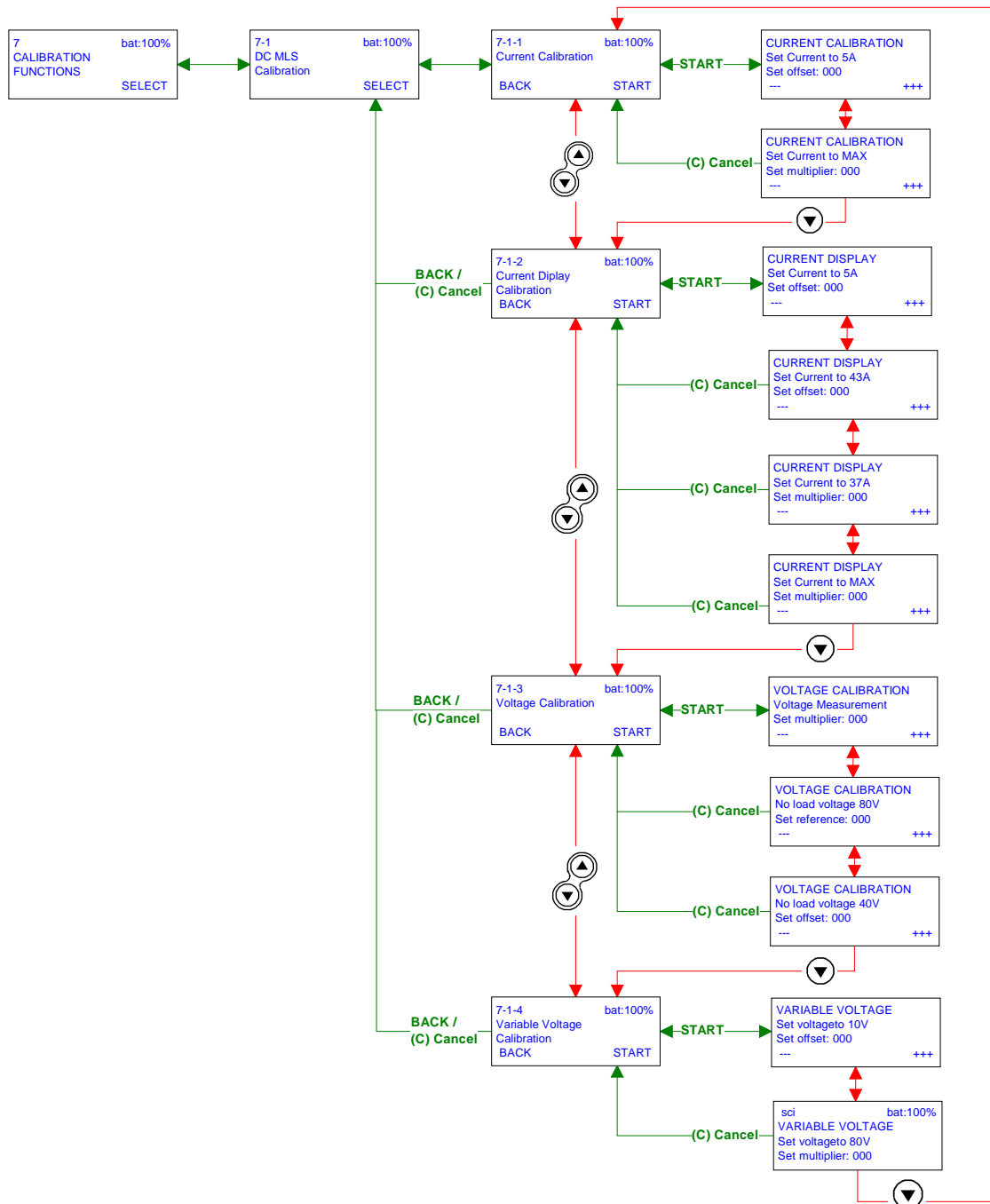
DataMaster works like a real DLI 6 device. When the DLI 6 mode is selected, it is not possible to use PC to DataMaster functions. You can exit DLI 6 mode by pressing **Cancel** or **Back** keys.

When DLI 30 mode is ON the device (e.g. panel) can be programmed by using FastProgrammer program on your computer.

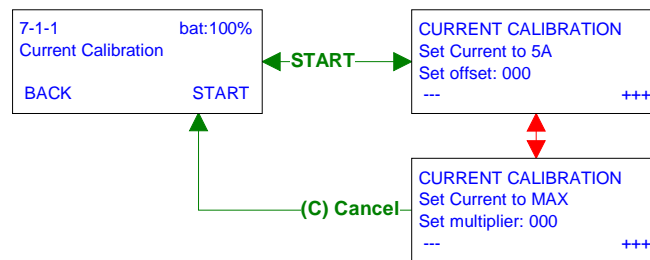
4.8. Calibration functions

When using the calibration function, the DataMaster II device must be connected to the Power source with a special cable. A 10-pin cable should be connected between the DataMaster II device and the MLS power source.

4.8.1. DC MLS calibration

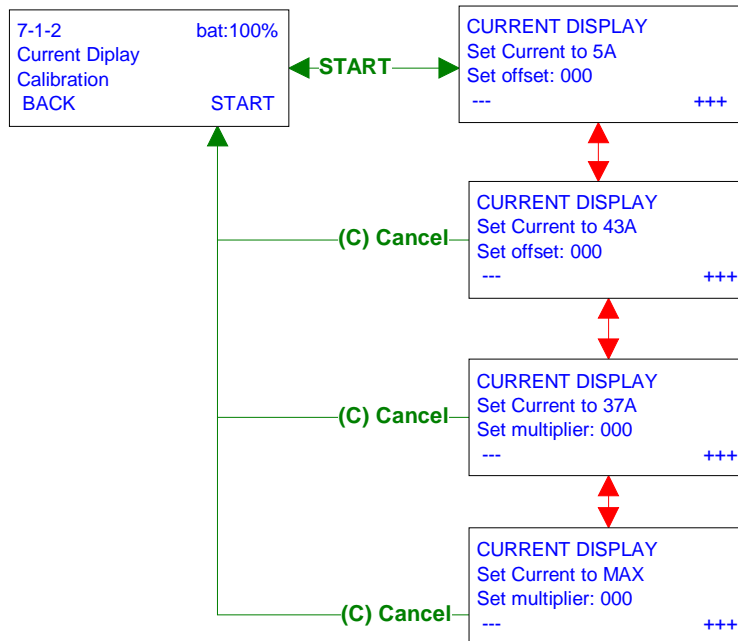


Current calibration



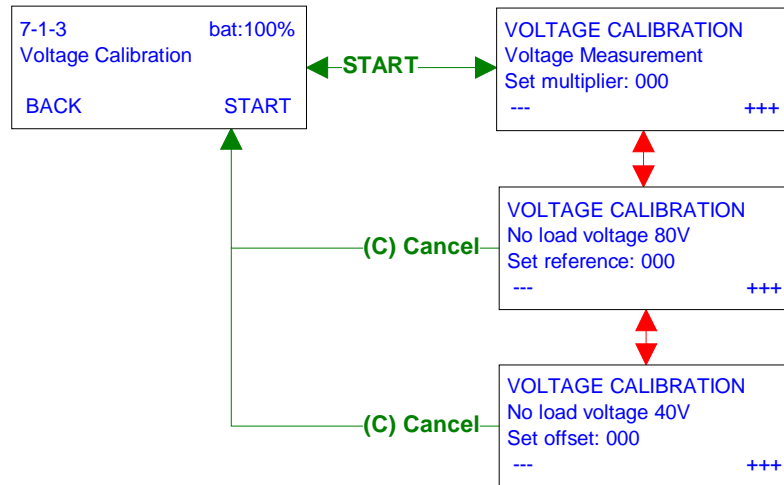
1. Connect an external current and voltage meter to the power source.
2. Turn the power source on.
3. From the power source's control panel select **TIG welding**, and then select **Pulse off**.
4. Set the panel setup jumper A3 to value 0 (TIG antifreeze = disabled).
5. Set the panel current value to 5A, and select 4T function.
6. Set the HF CONTACT setting to ON.
7. Turn on the DataMaster II device and connect it to the power source.
8. On the DataMaster II device select **MLS CALIBRATION > CURRENT CALIBRATION**.
9. Connect the load to the welding machine. Connect LVR or similar load to MMA connectors.
10. Set the load and press the torch start switch. If the power source does not start, change the load value and try again.
11. Set the offset value using the **---/+++** keys on the DataMaster II keypad until the measured external current is as close as possible to 5A. Do not change the current value from the panel.
12. Press **down arrow** key in DataMaster II keypad.
13. Set current value to maximum from the panel. You may have to change the load value so that the current reaches its maximum value.
14. Set the multiplier using the **---/+++** keys until the measured external current is as close as possible to the machine's maximum current value.
15. Press **Cancel (C)** or **down arrow** key to end the calibration.

Current display calibration



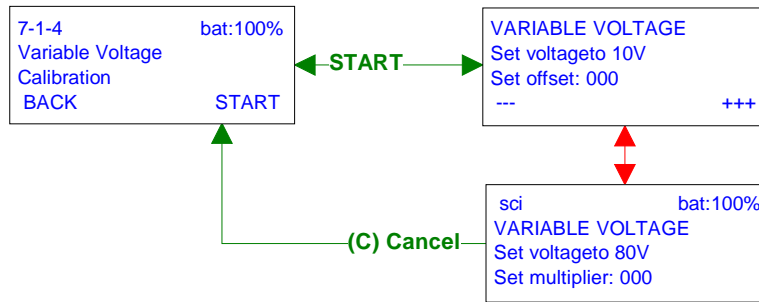
1. Press **SELECT** on DataMaster II to select the **CURRENT DISPLAY CALIBRATION**.
2. Set the current value to 5A in the control panel.
3. Set the load and press the torch start switch. If the power source does not start, change the load value and try again.
4. Set the offset value using the **---/+++** keys on the DataMaster II keypad until the panel current display is as close as possible to 5A.
5. Press the **down arrow** key on the DataMaster II keypad.
6. Set the current to 43A on the panel. Wait 5 seconds, so that the measured current value appears on the panel display. Set the offset value using the **---/+++** keys until the panel current display is as close as possible to 43A.
7. Press the **down arrow** key on the DataMaster II keypad.
8. Set the current to 37A from the panel. Wait 5 seconds, so that the measured current value appears on panel display. Set the multiplier value using the **---/+++** keys until the panel current display value is as close as possible to 37A.
9. Press the **down arrow** key on the DataMaster II keypad.
10. Set current value to maximum from the panel. Wait 5 seconds, so that the measured current value appears on panel display. Set the multiplier value using the **---/+++** keys until the panel current display value is as close as possible to the welding machine's maximum value.
11. Finish the welding.
12. Set the jumper A3 to its original position.
13. Press **Cancel (C)** or **down arrow** key to end the calibration.

Voltage calibration



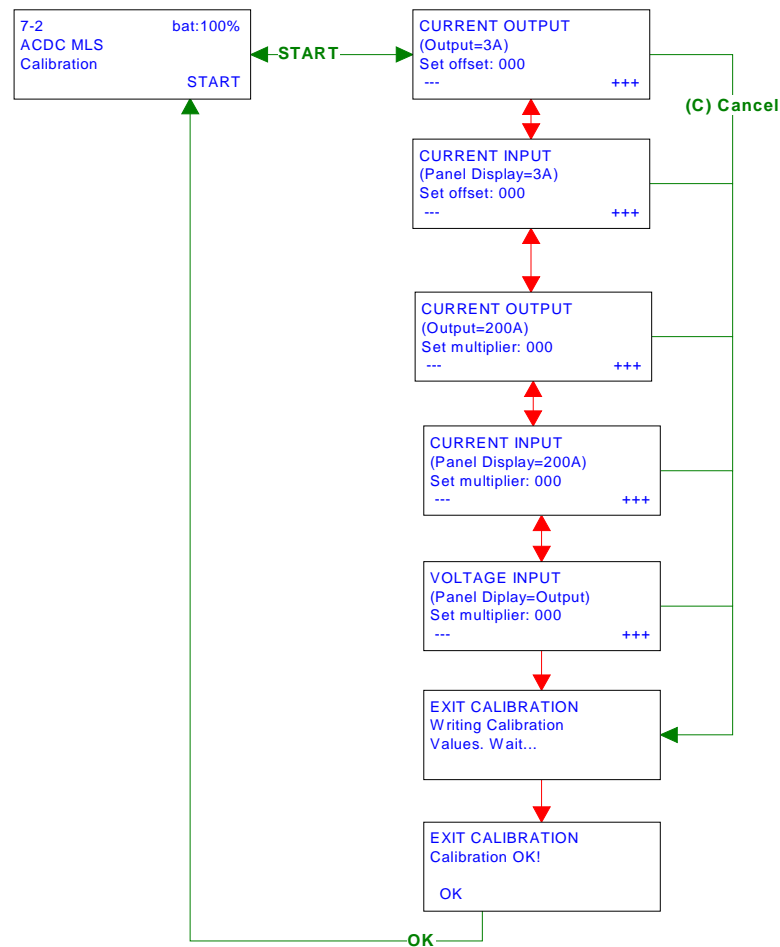
1. Disconnect the load from the welding machine.
2. From the DataMaster II device select **MLS CALIBRATION > VOLTAGE CALIBRATION > VOLTAGE MEASUREMENT**.
3. Set the panel setup jumper A7 to value 0 (No load voltage = 80V).
4. Select **MMA welding** from the panel and wait a few seconds until the voltage reaches its maximum value.
5. Set the multiplier value using the **---/+++** keys on the DataMaster II keypad until the panel voltage value on the display is as close as possible to the measured external voltage value.
6. Press the **down arrow** key on the DataMaster II keypad.
7. Set the voltage reference value using the **---/+++** keys until the measured external voltage value is as close as possible to 80V.
8. Press the **down arrow** key on the DataMaster II keypad.
9. Set the panel setup jumper A7 to value 1 (No load voltage = 40V).
10. Set the offset value using the **---/+++** keys until the measured external voltage value is as close as possible to 40V.
11. Press **Cancel (C)** or **down arrow** key to end the calibration.
12. Disconnect the DataMaster II device and reset the setup jumper A7 to its original position.

Variable voltage calibration (MEX panel)



1. Connect DataMaster II to the power source
2. Press SELECT from DataMaster II to select the option **VARIABLE VOLTAGE CALIBRATION**.
3. Set the panel setup jumper A7 to value 0 (user define no load voltage = enabled) and set the jumper b3 to value 10 (No load voltage setting = 10V).
4. Select MMA welding from the panel and wait a few seconds until the voltage reaches the maximum value.
5. Set the offset using the ---/+++ keys on the DataMaster II keypad until the measured external voltage value is as close as possible to 10V.
6. Press the **down arrow** key on the DataMaster II keypad.
7. Set the panel setup jumper b3 to value 80 (no load voltage setting = 80V).
8. Set the offset using the ---/+++ keys until the measured external voltage value is as close as possible to 80V.
9. Press **Cancel (C)** or **down arrow** key to end the calibration.
10. Reset the setup jumpers A7 and b3 to their original values.
11. Disconnect DataMaster II from the power source.

4.8.2. ACDC MLS calibration

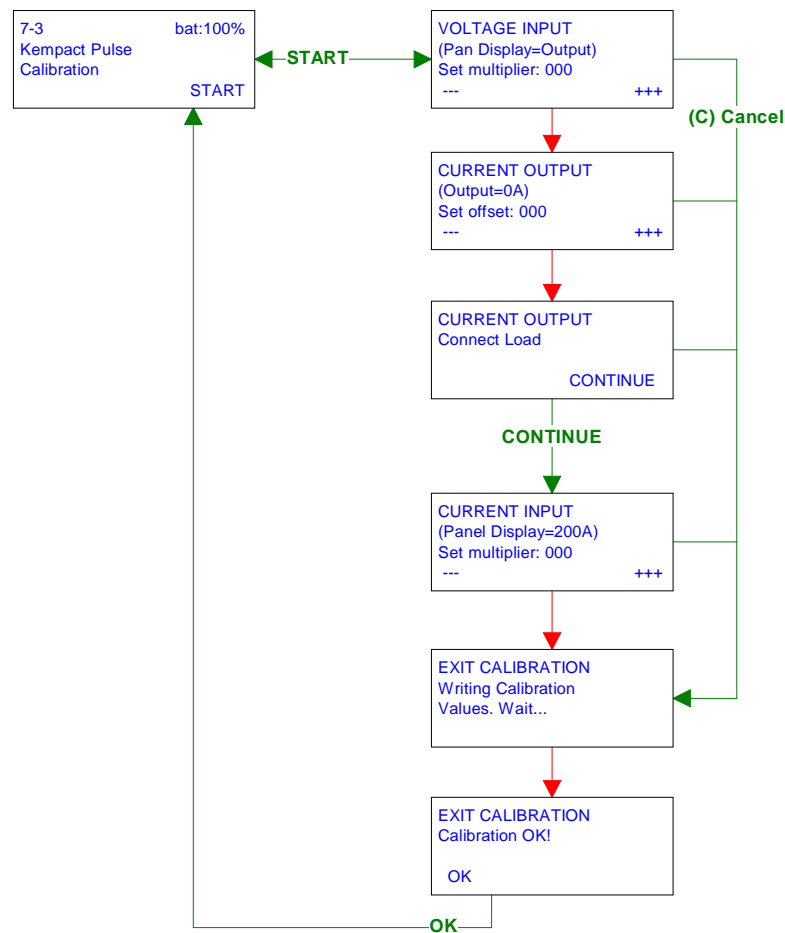


1. Connect DataMaster II to the power source.
2. Connect an external current and voltage meter to the welding machine and turn the welding machine on.
3. Connect LVR or similar load to MMA connectors.
4. Select **ACDC MLS CALIBRATION** and press **Start** key on the DataMaster II keypad.
5. DataMaster II sets the panel values and selections automatically (TIG, DC, 3A) and starts the power source.
6. Wait until the current is stabilized and the panel is in welding current state.
7. Measure the output current and change the *current output offset* value by using the **---/+++** keys on the DataMaster II keypad until the measured output current is close to 3A.
8. Press the **down arrow** key on the DataMaster II keypad.
9. Change the *Current input offset* value by using the **---/+++** keys in DataMaster until the current value on the panel is close to 3A.
10. Press the **down arrow** key on the DataMaster II keypad.
11. DataMaster II sets the welding current automatically to **MAX** value.
12. Change the *Current output multiplier* value by using the **---/+++** keys until the measured output current is close to MAX value.
13. Press the **down arrow** key on the DataMaster II keypad.



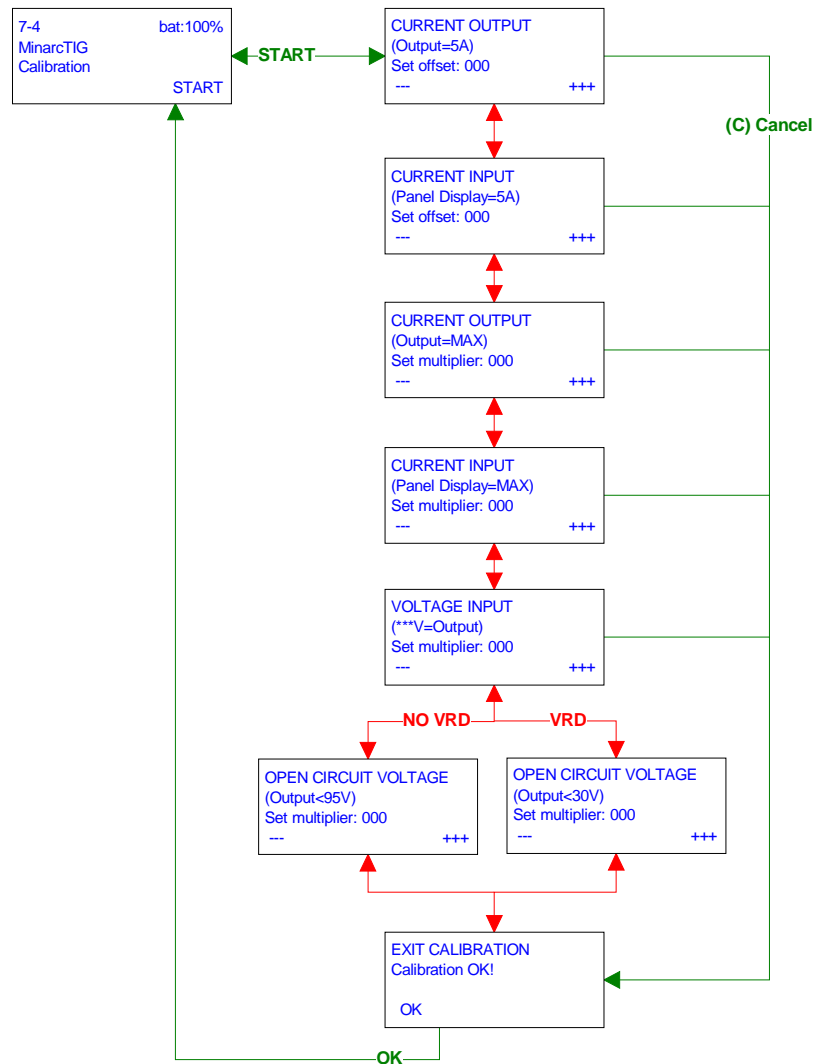
14. Change the *current input multiplier* value by using the **---/+++** keys until the current value on the panel is close to MAX value.
15. Press the **down arrow** key on the DataMaster II keypad.
16. DataMaster sets the welding current automatically to **MAX/2** (voltage calibration is made when power source is on and welding current is MAX/2).
17. Change the *voltage input multiplier* value by using the **---/+++** keys until the voltage value on the panel is close to the measured voltage.
18. Press **Cancel (C)** or **down arrow** key to end the calibration.

4.8.3. Kempact pulse calibration



1. Connect DataMaster II to the Power Source.
2. Connect an external current and voltage meter to the welding machine. Do not connect load.
3. Select **KEMPACT PULSE CALIBRATION** and press **START** on the DataMaster II keypad.
4. Wait until the voltage is stabilized and the panel is in welding current state.
5. Measure the output voltage and change the *voltage input multiplier* value by using the **---/+++** keys on the DataMaster keypad until the measured output voltage is close to the panel value.
6. Press the **down arrow** key on the DataMaster II keypad.
7. Change the *current output offset* value by using the **---/+++** keys until the current value on the panel is close to 0A.
8. Press the **down arrow** key on the DataMaster II keypad.
9. Connect the load to the welding machine.
10. Press **CONTINUE** on the DataMaster II keypad.
11. Change the *current output multiplier* value by using the **---/+++** keys until the measured output current is close to the panel value.
12. Press **Cancel (C)** or **down arrow** key to end the calibration.

12.1.1. MinarcTIG calibration



1. Disconnect connector X2 (Spark on/off) from the spark generator card A002
2. Turn on the welding machine and the DataMaster II device.
3. Connect the DataMaster II device to MinarcTIG panel.
4. Connect an external current and voltage meter to the welding machine and turn the welding machine on (connect load to MMA connectors) (LVR or similar).
5. Select **MINARCTIG CALIBRATION**.
6. Set panel settings **TIG, HF, 4T, and 5A**. Set appropriate load (LVR load 25 / MinarcTig 180). Start welding by pressing the torch start switch.
7. Wait until the current is stabilized and the panel is in welding current state.
8. Measure the output current and change the *current output offset* value by using the ---/+++ keys on the DataMaster II keypad until the measured output current is close to 5A.

If the welding machine turns off by itself, press the **down arrow** key on the DataMaster II keypad. Decrease the *current input offset* value by using the ---, press the **up arrow** key on the DataMaster II keypad and repeat steps 6, 7. and 8.

9. Press the **down arrow** key on the DataMaster II keypad.
 10. Change the *current input offset* value by using the ---/+++ keys until the current value on the panel is close to 5A.
 11. Press the **down arrow** key on the DataMaster II keypad.
 12. Set current value to **MAX** from the panel. You may have to change the load value so that the current reaches the desired value (LVR load 200 + 100 / MinarcTig 180).
 13. Change the *current output multiplier* value by using the ---/+++ keys until the measured output current is close to Max.
 14. Press the **down arrow** key on the DataMaster II keypad.
 15. Change the *current input multiplier* value by using the ---/+++ keys in DataMaster until the current value on the panel is close to Max.
 16. Press the **down arrow** key on the DataMaster II keypad.
 17. Set current value to **50A** and change the load values so that the measured output voltage is close to 30V (LVR load 50 / MinarcTig 180).
 18. Change the *voltage input multiplier* value by using the ---/+++ keys until the DataMaster voltage value on the panel is close to the measured value. Stop welding by pressing the torch start switch.
 19. Press the **down arrow** key on the DataMaster II keypad.
 20. Take the load off and turn the welding machine to **MMA** mode.
 21. Change the *voltage output multiplier* value by using the ---/+++ keys until the measured voltage is under 95V or in VRD machines under 30V.
- Press **Cancel (C)** or **down arrow** key to end the calibration.

4.9. DataMaster 'Auto OFF' feature

If DataMaster II is idle for 10 minutes, the device is automatically turned OFF.

The 'Auto OFF' feature is not activated, when

- DataMaster is connected to the charger
- DataMaster is in DLI mode
- Data transfer is in progress between DataMaster and PC.

4.10. Special function keys A-F

The special function keys A-F on DataMaster keypad can be used for menu shortcuts. When a menu is on display, the number of the menu can be saved to any of these keys by a long key press. For example, if you want to save the current menu's shortcut to the key 'A', you must press and hold the key, until you see the message: 'Menu number is saved to key A'. Now, when you press key 'A' again, DataMaster will jump directly to the saved menu number.

4.11. DataMaster reset key function

Sometimes it may be necessary to reset the DataMaster II device, if the device doesn't respond to key presses. This can be done by pressing **ON/OFF** and **RESET** keys simultaneously for at least 3 seconds. Reset operation will turn the DataMaster II device OFF. After the reset DataMaster II can be turned on normally by pressing the **ON/OFF** key.

5. DATAMASTER II MAINTENANCE

5.1. MAINTENANCE

Product maintenance routines depend on the utilisation rate and the operation environment of the device. Cautious use and preventive maintenance help to avoid unnecessary production disturbances and breaks.

12.1.2. *Battery maintenance*

- Always prepare brand new batteries for the first use. When charging the battery for the first time keep the battery in the charger approximately 50% longer time than in a normal charge. *DO THIS ONLY IN THE FIRST CHARGING.*
- Before recharging the battery, wait until DataMaster II battery indicator is low (2-10%).
- Do not let the DataMaster II device stay in a charger any longer than is necessary. When the battery is full, remove the device from the charger.

5.1. ORDERING NUMBERS

DataMaster II	6265041
DataMaster II CD	W002409
Battery	4301110T
LCD module	4301180T
Strap	9592161
Charger	9777812
Keyboard	3149680
RS-cable	9720822
PRO/CAN-cable	4298780
ISP flat cable	W002408
UBS-cable	9770642
DataMaster II-AC/DC adapter	4302380
FastMIG Basic 10/7 cable	4298790

5.2. TROUBLESHOOTING

12.1.3. Troubleshooting the DataMaster II

DataMaster II won't turn on.

- Battery may be empty or damaged. Recharge the battery or replace it with a new one.
- If the problem persists, disconnect all cables and press and hold the reset key for a long time (>4s), then try to turn on the DataMaster II.

DataMaster II turns off unexpectedly.

- If a separate control panel is connected to DataMaster II, the battery level may fall so much that the DataMaster II turns off.
- Connect DataMaster II to an external power source.

DataMaster II battery won't recharge

- Battery may already be full. Check if the percent value is 100%.
- Charger may be damaged. Replace the charger.
- Battery may be damaged. Replace battery. Only same type of battery must be used.
- Charger adapter coupling may be wrong. Change the charger adapter polarity. Correct polarity: tip = positive, frame = negative.

Connection between PC and DataMaster II won't work

- There may be a problem with the connection cable. Check the RS/USB cable.
- The DataMaster II device may be turned off. Turn DataMaster II on.
- If the problem persists, reset DataMaster II.

12.1.4. Troubleshooting the programming routines

If there is a problem with the programming routine, do the following:

- Check that the target board is correctly powered.
- Make sure that all connections are correct.
- Check that the correct device is connected to the socket and that it is right way round.
- Check that the MLS programming flat cable or PRO/CAN cable is correctly connected.
- If the problem persists, restart the welding machine and DataMaster II.

12.1.5. Troubleshooting the calibration routines

The power source won't start or the voltage won't rise.

- There may be a wrong menu in the display. Check the manual to select the right menu function.
- There may be a faulty connection between the DataMaster II and the welding machine. Check all connections.
- The value of the external load may be wrong.

The connection between DataMaster II and Power source won't work ('Wait' is displayed).

- There may be a faulty connection. Check all DataMaster II connections.
- Select **Cancel** and start again.

The Power Source shuts down when changing the offset value.

- The load value may be wrong. Try changing the load value so that the output voltage is in allowed range.

12.1.6. Flash memory read error! (Recharge battery)

In the case of a flash memory read error the battery voltage may be low and the DataMaster memory won't work correctly. Try recharging the battery and resetting the DataMaster.

5.3. RECYCLING THE MACHINE

Kemppi machines are mainly produced of recyclable materials. When disposing of the used-up product, you should deliver the used device to a treatment plant, where it is possible to separate the materials from each other for recycling.

6. TECHNICAL DATA AND TERMS OF GUARANTEE

6.1. TECHNICAL DATA

DataMaster II	DataMaster II unit
DataMaster II parts	Charger Strap DataMaster II program CD ISP interface flat cable PRO/CAN interface cable RS-232 cable USB cable DataMaster II - AC/DC adapter
Dimensions	Length 225mm Width 148mm Height 37/79mm Weight 790g
Interfaces	12V DC charger connection ISP/SCI programming/calibration interface PRO bus interface RS-232 PC interface USB interface (virtual COM port)
Battery	NiMh 1500mA / 6V
Power consumption	Backlight OFF: 110mA Backlight ON: 85mA
Charger	Input 230VAC 50Hz Output: 12VDC 600mA 7.2VA Connector TIP = positive (+), frame = negative (-).

6.2. TERMS OF QUARANTEE

KEMPPi OY provides a guarantee for products manufactured and sold by them if defects in manufacture and material occur. Guarantee repairs must be carried out only by an authorised KEMPPi service workshop. Packing, freight and insurance cost are to be paid by third party. The guarantee takes effect on the day of purchase. Verbal promises which do not comply with the terms of guarantee are not binding on guarantor.

Limitations on guarantee

The following conditions are not covered by the terms of guarantee: defects due to fair wear and tear, non-compliance with operating and maintenance instructions, connection to incorrect or faulty supply voltage (including voltage surges outside equipment spec.), transport or storage damage, fire or damage due to natural causes i.e. lightning or flooding.

This guarantee does not cover direct or indirect travelling costs, daily allowances or accommodation. Direct or indirect damage due to a defective product is not covered under the guarantee.

The guarantee is void if changes are made to the product without approval of the manufacturer, or if repairs are carried out using non-approved spare parts. The guarantee is also void if repairs are carried out by non-authorised workshop.

Undertaking guarantee repairs

Guarantee defects must be informed to KEMPPi or authorised KEMPPi Service Workshop within the guarantee period. Before any guarantee work is undertaken, the customer must provide a proof of the purchase and the serial number of the equipment in order to validate the guarantee.

The parts replaced under the terms of guarantee remain the property of KEMPPi. Following a guarantee repair, the guarantee of the machine or equipment, repaired or replaced, will be continued till the end of the original guarantee period.