

CODIPROC

Universal EEPROM and Flash memory programmer

Instruction Manual

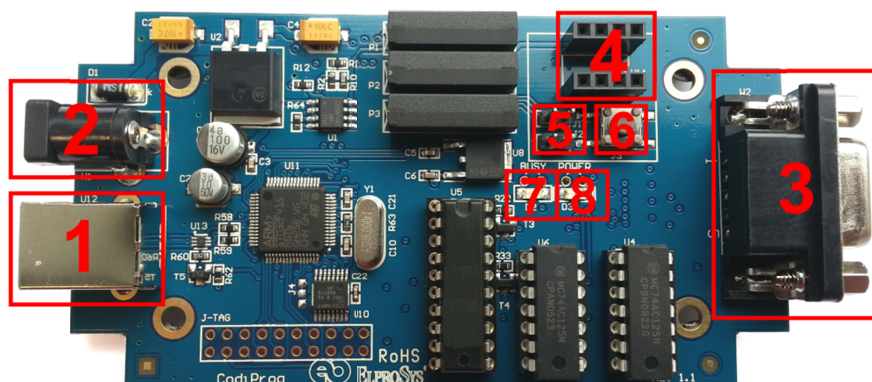
ENGLISH VERSION


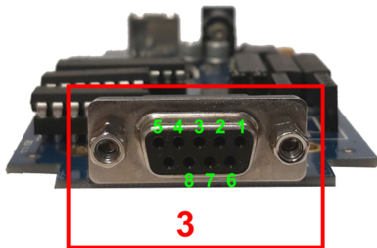
ElproSys Sp. z o.o.
ul. Tarnogórska 140
44-102 Gliwice
Poland

| | | |
|---|--------------------------------|----|
| 1 | ABOUT CODIPROG | 3 |
| 2 | HARDWARE DESCRIPTION | 4 |
| 3 | USER INTERFACE | 6 |
| 4 | FIRMWARE UPGRADE | 9 |
| 5 | JUMPER SETUP | 10 |
| 6 | MOTOROLA MCU CABLE CONNTECTION | 11 |
| 7 | MEMORY TYPES | 15 |
| 8 | ERRORS AND PROBLEMS | 16 |

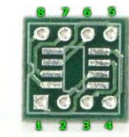


2 Hardware description

Component layout



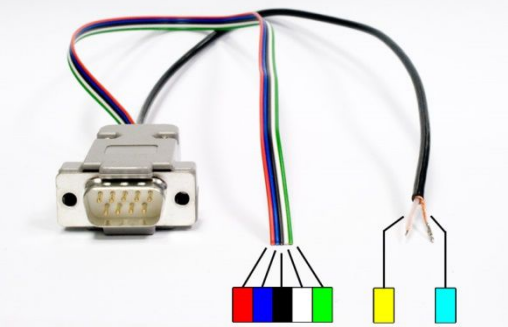


| | | |
|---|--|--|
| 1 | USB type B socket | |
| 2 | DC power socket with center pin in diameter of 1.0mm. Input voltage range 12-14.4V.  | |
| 3 | DB9 connector for extension adapters and cables. |  |
| 4 | Programming socket | |
| 5 | J1 and J2 jumpers | |
| 6 | Control button | |
| 7 | BUSY LED. Indicates that device is working. | |
| 8 | POWER LED. Indicates that device is turned on. | |

Extension adapters pinout.

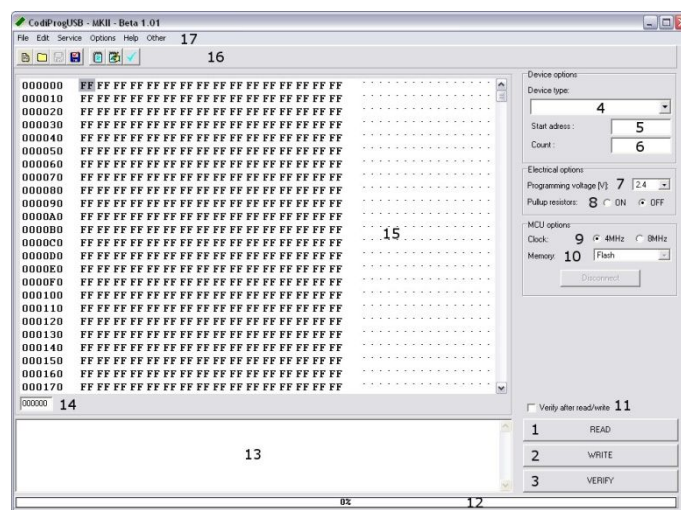
| | |
|-----------------------------|--|
| Surface mount adapter. |  |
| Through-hole mount adapter. |  |
| |  |

Extension cable description.

| | |
|-------------|--|
| C12/2 cable |  |
| C14/2 cable |  |
| H1/3 cable |  |

3 User Interface

Main window



| | Name | Description |
|----|-------------------------|---|
| 1 | READ | Starts read command |
| 2 | WRITE | Starts write command |
| 3 | VERIFY | Starts verify command |
| 4 | Memory Type | Use it to select memory type |
| 5 | Start address | Beginning address of memory for operation |
| 6 | Count | Bytes count for operation |
| 7 | Programming Voltage | Voltage level used to supply memory chip during operation |
| 8 | Pullup resistors | Specifies whether pullup resistors are on or off |
| 9 | Clock | MCU oscillator speed |
| 10 | Memory | MCU memory type (Flash/EEPROM) |
| 11 | Verify after read/write | Automatic verification after finished read or write operation |
| 12 | Progress bar | Displays progress of current operation |
| 13 | Status panel | Displays information about operation status |
| 14 | Cursor address | Shows current cursor address |
| 15 | Memory buffer | Displays memory buffer content |
| 16 | Quick toolbar | Quick access to basic options |
| 17 | Main toolbar | Toolbar with all CodiProg options |

Read/Write/Verify operation

1. Connect CodiProg device to computer, and run CodiProg software.
2. Select memory type.
3. Change start address and bytes count if needed.
4. Set programming voltage
5. Enable or disable pull-up resistors
6. Start operation by clicking Read/Write or Verify button

Toolbar

File menu

| | |
|--------------|---|
| Empty buffer | Clears memory buffer |
| Open | Open file and load its content to memory buffer |
| Save | Save memory buffer to file |
| Save as | Save memory buffer to file with specified name |
| Exit | Exit CodiProg USB software |

Edit menu

| | |
|------------|--|
| Fill | Fills memory area with SPECIFY data |
| Find | Searches for data in memory buffer |
| Find Next | Next appearance of searched data in memory buffer |
| Swap bytes | Changes byte order in memory buffer (big-endian - little-endian) |

Service menu

| | |
|-------------------|--|
| Read | Starts read operation |
| Write | Starts write operation |
| Verify | Starts verify operation |
| MC9S12 Mass Erase | Starts Mass Erase operation. This option erases entire Flash and EEPROM memories and unsecures microcontroller. Works only with 9S12 microcontrollers. |

Options menu

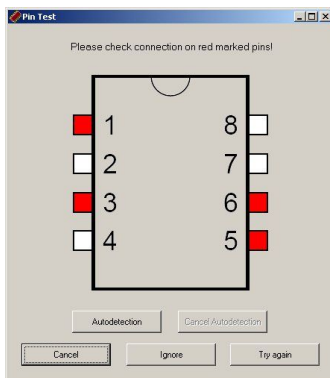
| | |
|---------------------------------|--|
| Self test | Starts self test operation. This function will check voltage levels and pin functionality. |
| Restore default memory settings | Use this option to reset to defaults memory setting such as: memory size, start address, programming voltage, pullup resistors, frequency and phase parameters |
| Firmware Upgrade | This option allows you to upgrade device firmware |

Help menu

| | |
|-------|--|
| Help | Displays this help screen. |
| About | Displays device hardware and firmware version and device serial number |

Pin Test

At the beginig of each operation CodiProg device performs "pin test" to chcek that connection on every pin is correct. If any errors are found durring this test this message is displayed:



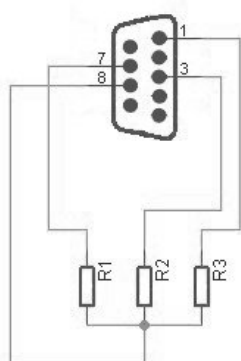
Red marks shows pins with errors.

Autodetect option allows to run pin test in a loop and start operation automatically when there are no errors.

Self test

Self test option allows to test internal systems of CodiProg. It is a two step process. First all programmation voltages are tested, if any of these voltages are out of range message is displayed in status panel. In second test CodiProg is testing pins. Special test adapter is required, otherwise errors on pin 1,3 and 7 may occur. This adapter is easy to build, only three 1000 Ohm resistors are required. If error on any pin is detected, message is displayed in status panel.

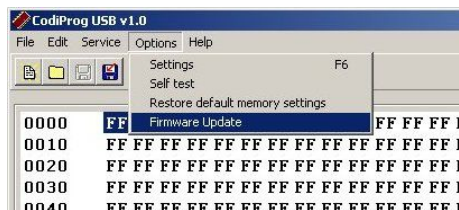
Resistors need to be connected as shown below:



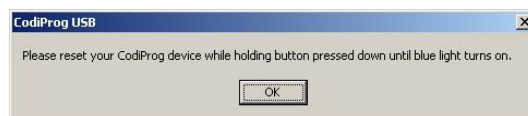
4 Firmware Upgrade

In order to upgrade your device firmware, following sequence must be executed:

Select "Firmware Upgrade" option from "Options" menu.



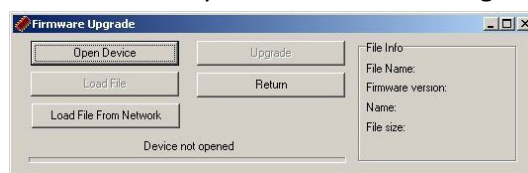
a. Connect device



To upgrade CodiProg USB device firmware, you have to prepare your device by entering special firmware upgrade mode. To do so you need to turn your device off by turning power supply off then press and hold the button on device and turn power supply on again. Hold button pressed until the blue light turns on (and stay turned on). If light blinks few times this mean device is in normal operation mode. Probably because the button was not pressed at the moment when you turned power on.

b. Open device

Click the 'Open Device' button. If device is correctly connected following message should appear 'Device opened'. If this message did not appear please check if the device is in firmware upgrade mode (blue light on), and drivers are correctly installed. Then start again beginning from step 1.



c. Load File

Successful device opening enables 'Load File' button. Click it and select proper firmware file. Only *.cpu files are supported. If the file is correct 'File successfully loaded' message and data in 'File info' panel should appear.



If your computer is connected to internet you can also use 'Load from network' option to download newest firmware version from ElproSys server directly to your device.

d. Upgrade

If firmware file is correctly loaded then 'Upgrade' button is enabled. Click it and your CodiProg device will be programmed with file content.

After upgrade device is automatically reseted, so if you want to upgrade it again you have to enter firmware upgrade mode again (see step 1.)

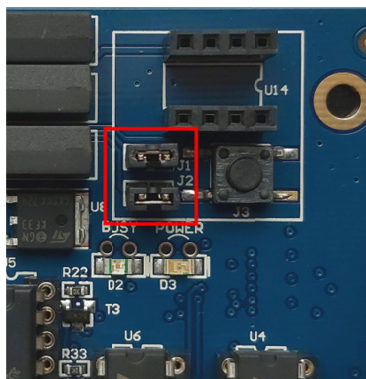
e. Return

After finished programming click 'Return' button to finish upgrade operation

Your device is ready to use.

5 JUMPER SETUP

Codiprog can work without PC software control. This mode can be used to run one of the operations shown in table below. Setting J1 and J2 jumpers according to description below lets you run desired operation.



Possible operations are:

| J1 | J2 | Description |
|--------|--------|---|
| CLOSED | CLOSED | Erasing first 20B of M35080-V6 and M35080-VP EEPROM |
| OPEN | CLOSED | Erasing first 20B of M35080, M35080-3 and M35080-6 EEPROM |
| CLOSED | OPEN | Erasing first 20B of D80D0WQ EEPROM |
| OPEN | OPEN | Erasing first 20B of 160D0WQ EEPROM |

To run one of these operations following steps should be performed:

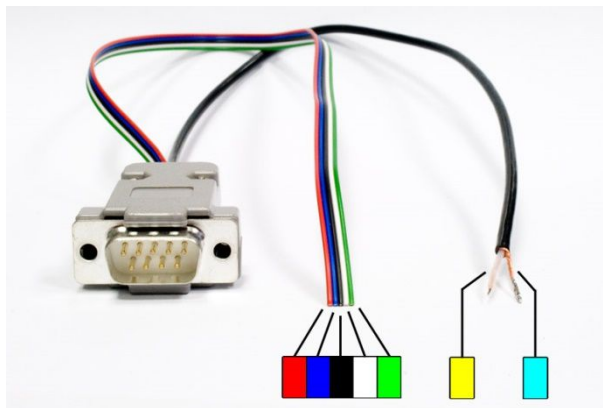
1. Set jumpers J1 and J2 according to required operation.
2. Power up Codiprog device.
3. Wait until busy led blinks three times and turns off.
4. Press button next to leds and hold it until busy led starts to blink again.
5. When busy led turns off the operation is successfully completed and memory chip can be removed from socket. If erasing proces takes more than 10 minutes then operation is terminated and busy led is turned on (and not blinking).

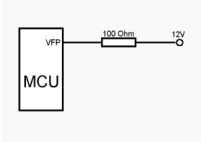
If operation is interrupted memory content may be lost. It is strongly recomend to backup all data before runing this operations.

6 Motorola MCU cable connection

To program any of the supported Motorola microcontroller the motorola cable is needed. All cable pins are marked with colors that correspond to microcontroller pins. All needed pins are marked on pictures below.

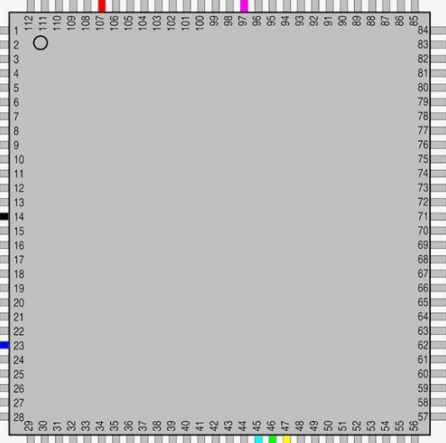
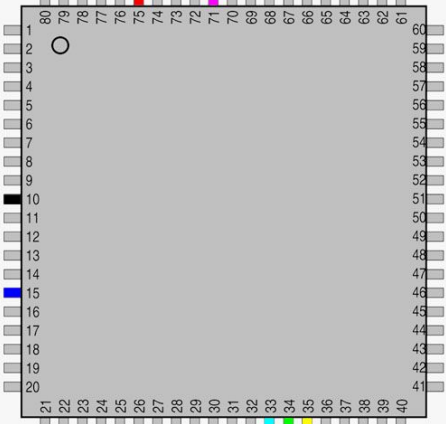
Cable description

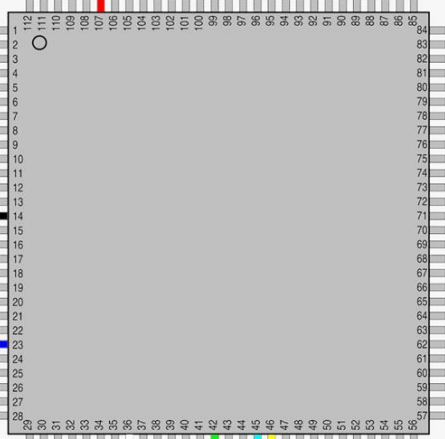
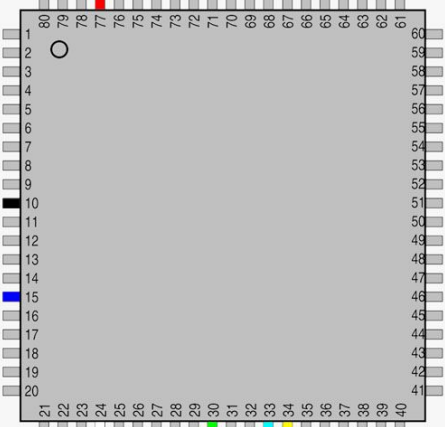


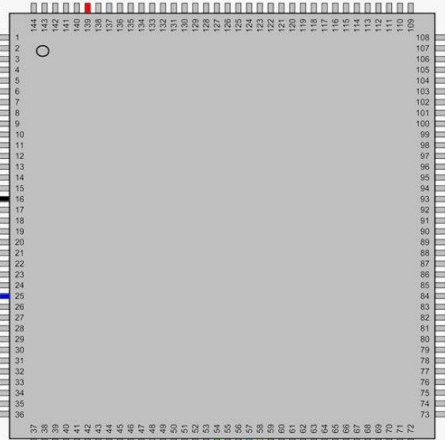
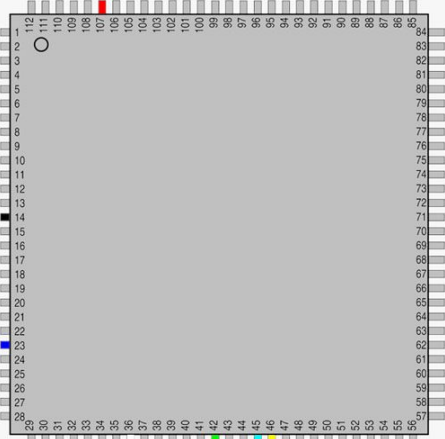
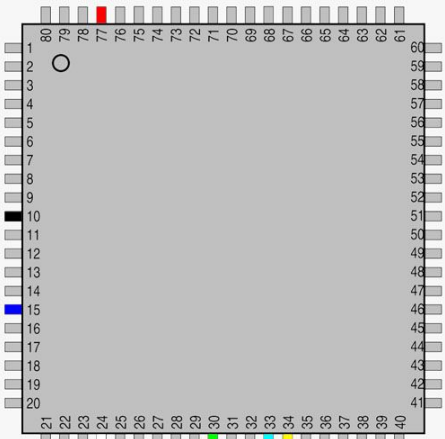
| Color | Signal description |
|-----------|--|
| WHITE | XCLKS |
| GREEN | RESET |
| RED | VDD |
| BLUE | BKGD |
| BLACK | VSS |
| YELLOW | EXTAL Coaxial - signal |
| TURQUOISE | VSSPLL Coaxial - shield |
| PURPLE | <p>VFP Additional 12V for flash programming.</p>  <p>Not used in all mask types. Please check MCU manufacturer's documentation for usage description of this pin.</p> |

MCU connection

MCU supported: MC68HC912D60A, MC68HC912DC128, MC68HC912DG128, MC68HC912DC128A, MC68HC912DG128A, MC9S12D64, MC9S12DB128B, MC9S12DG128B, MC9S12DT128B, MC9S12A128B, MC9S12H128, MC9S12DG256C, MC9S12DP256C, MC9S12DT256C, MC9S12H256, MC9S12XDP512

| MCU | Package | Wire | PIN NUMBER |
|-----------------|--|------|------------|
| MC68HC912D60A |  | | 14 |
| MC68HC912DC128 | | | 23 |
| MC68HC912DG128 | | | 45 |
| | | | 46 |
| | | | 47 |
| | | | 97 |
| | | | 107 |
| MC68HC912DC128A |  | | 10 |
| MC68HC912DG128A | | | 15 |
| | | | 33 |
| | | | 34 |
| | | | 35 |
| | | | 71 |
| | | | 75 |

| MCU | Package | Wire | PIN NUMBER |
|--------------|---|------|------------|
| MC9S12D64 |  | | 14 |
| MC9S12DB128B | | | 23 |
| MC9S12DG128B | | | 36 |
| MC9S12DT128B | | | 42 |
| MC9S12A128B | | | 45 |
| MC9S12DG256C | | | 46 |
| MC9S12DP256C | | | 107 |
| MC9S12DT256C | | | 10 |
| | | | 15 |
| | | | 24 |
| |  | | 30 |
| | | | 33 |
| | | | 34 |
| | | | 77 |
| | | | |

| MCU | Package | Wire | PIN NUMBER |
|--------------|--|------|------------|
| MC9S12XDP512 |  | | 16 |
| | | | 25 |
| | | | 48 |
| | | | 54 |
| | | | 57 |
| | | | 58 |
| | | | 139 |
| |  | | 14 |
| | | | 23 |
| | | | 36 |
| | | | 42 |
| | | | 45 |
| | | | 46 |
| | | | 107 |
| |  | | 10 |
| | | | 15 |
| | | | 24 |
| | | | 30 |
| | | | 33 |
| | | | 34 |
| | | | 77 |

7 Memory types

Supported memory types

| I2C | SPI |
|---|---|
| 24C01, 24C02, 24C04, 24C08, 24C16, 24C32, 24C64, 24C128, 8582C, GREEN | 25C010, 25C020, 25C040, 25C080, 25C160, 25C320, 25C640, 25C128, 25C256, SP08, M35080, M35080-3, M35080-6, M35080V6, M35080VP, D80D0WQ |
| Mircowire 16bit | Microwire 8bit |
| M9306, M9346, 93C06, 93C46, 93C56, 93C66, 93C76, 93C86, 93CS56, 93CS66, 93CS76, 93CS86, 93S46 | 93C46, 93C56, 93C66, 93C76, 93C86, Yazaki |
| Freescape / Motorola | |
| MC68HC912D60A (2K38K) MC68HC912DC128 (0K50E) MC68HC912DG128 (5H55W) MC68HC912DC128A (3K91D) MC68HC912DG128A (3K91D) MC9S12D64 (2L86D) MC9S12DB128B (0L85D) MC9S12DG128B (0L85D) MC9S12DT128B (0L85D) MC9S12DT128B (1L85D) MC9S12DT128B (3L40K) MC9S12A128B (0L85D) MC9S12H128 (1K78X) MC9S12DG256C (2K79X) MC9S12DP256C (2K79X) MC9S12DT256C (2K79X) MC9S12H256 (1K78X) MC9S12XDP512 (0L15Y) | |

8 ERRORS AND PROBLEMS

Can't read MCU

CodiProg device is unable to read MCU status and ID.
Check if you choose correct MCU and mask type.
Be sure that all wires are connected to correct pins.
Reset CodiProg device and try again.
Use Selftest option and test adapter to check device.
Remember to use 'Disconnect' option after finished work with MCU,

Link Error

CodiProg device is unable to establish connection with MCU.
Check if you choose correct MCU and mask type.
Be sure that all wires are connected to correct pins.
Set wider range of linking parameters (frequency and phase).
Use Selftest option and test adapter to check device.