

PixelController II

Art-Net controller for LED pixels



Art-Net node for drive digital RGB pixels and LED strips with SPI drivers

**APA102, INK1002, INK1003, LX1003
TM1803, TM1809, TM1812, UCS3903
WS2811, WS2812, WS1812B
UCS1903, UCS1903B, UCS1909, UCS1912, UCS2903 UCS2909,
UCS2912, LPD1883, LPD1886
WS2801, WS2803
LPD6803, LPD1101, UCS6909, UCS5903, UCS7009
LPD8803, LPD8806, P9813, P9816**

User manual

PixelController II

Art-Net controller for LED pixels

INDEX

Page

01	Front	
02	Index	
03	Safety information & Maintenance	
04	Features	
	Supported led driver types	
05	Output timings	
	Universe SPI outputs	
06	Scheme SPI outputs	
07	Comming soon updates for PixelController-II	Rev.A:
08	DIP Switch configuration	
09	Maximun Framerate (fps)	
10	Art-Net Network configuration	
12	Change Art-Net node IP	
	Change settings of universes	
14	Hard Reset	
	Specifications	

PixelController II

Art-Net controller for LED pixels

Safety information & Maintenance

Read this manual before powering or installing the device, follow the safety precautions listed below and observe all warnings in this manual.

- Be sure that the local power outlet matches that of the required voltage of the power supply included with this device.
- To reduce the risk of fire or electrical shock, do not expose the unit to rain or high levels of moisture.
- Do not spill water or other liquids into or on your unit.
- Do not open the unit as there are no user serviceable parts inside.
- Do not dismantle or modify the unit, as this voids all warranties.
- Do not attempt repairs. Repairs by unqualified people could cause damage or faulty operation.
- Unplug this unit when not used for long periods of time.
- Clean only with dry cloth.
- Handle this unit carefully. Any strong shock or vibration may result in malfunction.

Models availables:

PixelController II Rev. A 4 universes - **4 output universes (680 pixels).**
PixelController II Rev. A 6 universes - **6 output universes (1020 pixels).**
PixelController II Rev. A 8 universes – **8 output universes (1360 pixels).**
PixelController II Rev. A 12 universes - **12 output universes (2040 pixels).**

Features

PixelController II

Art-Net controller for LED pixels

- Integrated SPI Controller for led pixels.
- Firmware Upgradeable.
- On-the-fly RGB color reorder.
- Settings configured by software/DIP switches.
- Power adapter 6 vdc included. Connector available for EU, UK or US (Indicate your connector in comments of the order)
- Works with any console or software that supports Art-Net II or Art-Net III protocol, as MADRIX®

Revision A

We have rewritten from scratch all output modules, 100% in assembler, as a result of this, was possible to implement **on-the-fly RGB color reordering** without any loss of performance, and **ultra-precise output timing**, avoiding possible flickering problems.

Supported led driver types (at 02-02-2014)

1 wire (DATA):

TM1803
TM1804 --> (Available for custom orders)
LPD1883, LPD1886 (24 bits color)
TM1809
TM1812
UCS3903
WS2811
WS2812
WS2812B
UCS1903, UCS1903B, UCS1909, UCS1912, UCS2903, UCS2909, UCS2912
INK1002, INK1003, LX1003

2 wires (DATA,CLOCK):

APA102
WS2801, WS2803
LPD6803, LPD1101, UCS6909, UCS5903, UCS7009
LPD8803, LPD8806
P9813, P9816

Output timing

PixelController II

Art-Net controller for LED pixels

	<i>1 wire Bit Timming (nS)</i>				
<i>TYPE</i>	<i>T0-H</i>	<i>T1-H</i>	<i>T0-L</i>	<i>T1-L</i>	<i>TOTAL</i>
TM1803	300	700	700	300	1,00 uS
TM1804	450	950	950	450	1,40 uS
TM1809	350	750	750	350	1,10 uS
TM1812	400	800	700	300	1,10 uS
WS2811	250	650	1000	600	1,25 uS
WS2812	350	700	850	600	1,25 uS
WS2812B	400	800	850	450	1,25 uS
UCS1903	250	1000	1000	250	1,25 uS
LPD1883	250	600	600	250	0,85 uS

We can provide any other custom timing.

Actually, driver type and color order are configurable from DIP switches (same driver type and color order for ALL universes on each PixelController-II, See coming soon)

Universe SPI outputs:

Recommended balanced microphone cable or UTP cable cat 5. We have tested, and worked without problems up to 52 meters (170,56 feet) of distance from controller to leds.

In any case maintain signal lines as short as possible.

Connections to LED strips or LED pixels

Outputs PixelController II (Universes 1 to 12, GND common for all universes)

Chipsets 1 wire – DATA+GND to Pixels LED

Chipsets 2 wires – DATA+CLOCK+GND to Pixels LED

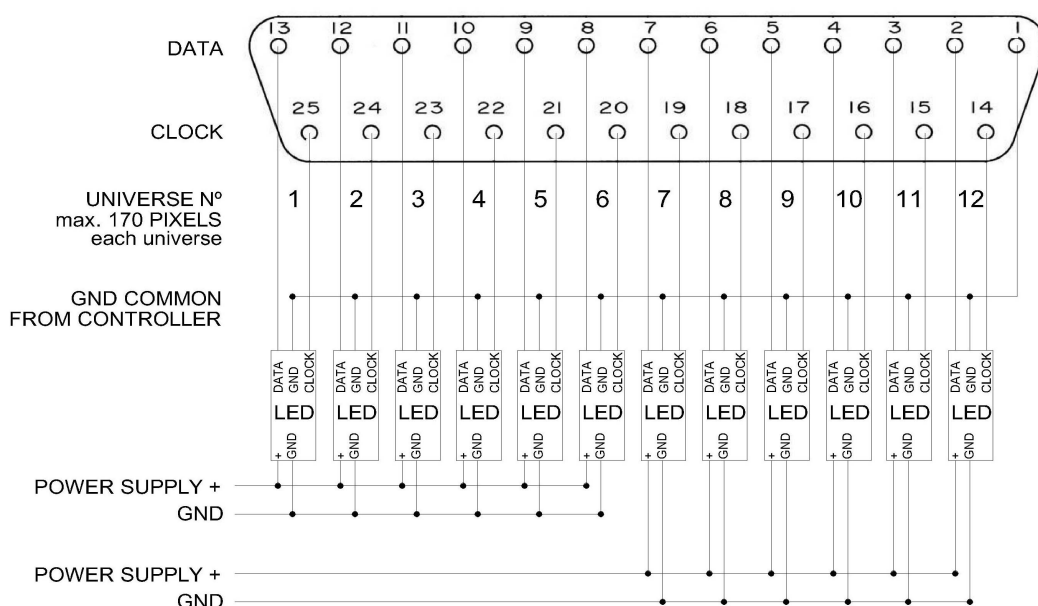
*** Special care needs to be taken to don't plug by error any audio line or DMX line with PixelController or digital led strips, **connect to 48v. phantom supply, or DMX levels may result on PixelController and/or leds permanently damaged** ***

*** PixelController incorporates serial output resistors to match impedance to led strips or pixels. Normally don't needs any other external resistor ***

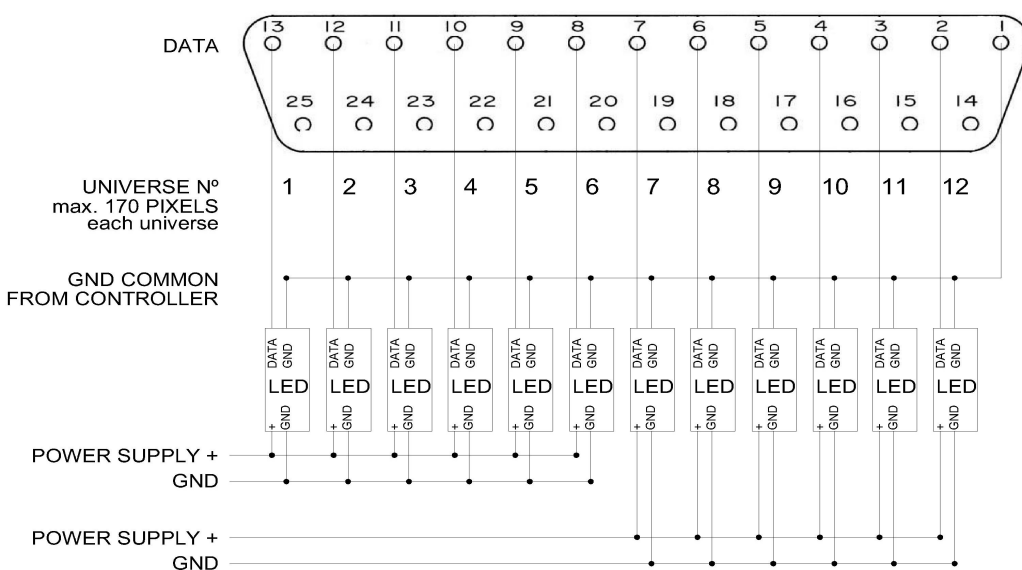
Scheme output connections to LED pixels 2 wires (DATA+CLOCK)

PixelController II

Art-Net controller for LED pixels



Scheme output connections to LED pixels 1 wire (DATA)



Imprescindible, check the pixel or strip LED, the right connections
 Never be guided by the color coded cables, or position, as they differ from one manufacturer to another

PixelController II

Art-Net controller for LED pixels

Coming soon updates for PixelController II

Available for all controllers sold from
February 2014

Coming soon

- **Configuration tool** (for windows), this software allows to make custom configurations and store up to 8 different configurations on PixelController (to use stored config simply select on DIP switches)

One of the most interesting features is the capacity to individually configure each universe, allowing to use different led driver types and different color order on each universe. (You can mix any type of supported led drivers, with any RGB order on the same PixelController-II) ***

*** With limits for 1 wire drivers (due to low data transfer rate on 1 wire models), even on 8 and 12 universes models.

Included on software is a frame rate calculator for view maximum performance reached with each combination of led drivers.

(By example, is NOT possible to run 6 universes with 1 wire driver type + 6 universes of 2 wires driver type at high frame rate)

PixelController II

Art-Net controller for LED pixels

DIP SWITCH CONFIGURACION







LED swich position

↑ - **OFF** - DIP switch **UP**

↓ - **ON** - DIP switch **DOWN**

RGB order color

PINS 1-2-3

↑↑↑xxxxx =	COLOR	
↑↑↓xxxxx =	COLOR	
↑↓↑xxxxx =	COLOR	
↑↓↓xxxxx =	COLOR	
↓↑↑xxxxx =	COLOR	
↓↑↓xxxxx =	COLOR	

Chipset 1 wire (DATA)

PINS 4-5-6-7-8

xxx↑↑↑↑↑ = TM1803
xxx↑↑↑↑↓ = LPD1883, LPD1886 (24 bits color only)
xxx↑↑↑↓↑ = TM1809
xxx↑↑↑↓↓ = TM1812
xxx↑↑↓↑↑ = WS2811
xxx↑↑↓↑↓ = WS2812
xxx↑↑↓↓↑ = WS2812B
xxx↑↑↓↓↓ = UCS1903, UCS1903B, UCS1909, UCS1912, UCS2903,
UCS2909, UCS2912, INK1002, INK1003, LX1003

Chipset 2 wires (DATA,CLOCK)

PINS 4-5-6-7-8

xxx↑↓↓↑↓ = APA102 (For firmware earlier than version 2.00)
xxx↑↓↓↑↑ = APA102 (For firmware 2.00 or higher)
xxx↓↑↑↑↑ = WS2801, WS2803
xxx↑↓↑↑↓ = LPD6803, LPD1101, UCS6909, UCS5903, UCS7009
xxx↑↓↑↓↑ = LPD8803, LPD8806
xxx↓↑↑↓↓ = P9813, P9816

PixelController II

Art-Net controller for LED pixels

Max framerate (FPS) – Universes

Chipset	4 univ.	6 univ.	8 univ.	12 univ.
APA102	143	97	73	49
TM1803	56	37	28	19
LPD1883, LPD1886 (24 bits color only)	41	27	20	14
TM1809	51	34	26	17
TM1812	51	34	26	17
UCS3903 (24 bits color only)	67	45	34	22
WS2811	45	30	23	15
WS2812	47	31	24	16
WS2812B	45	30	23	15
UCS1903, UCS1903B UCS1909, UCS1912 UCS2903, UCS2909 UCS2912, INK1002, INK1003, LX1003	45	30	23	15
WS2801, WS2803	116	77	58	39
LPD6803, LPD1101 UCS6909, UCS5903 UCS7009	241	161	121	80
LPD8803, LPD8806	185	123	93	62
P9813	166	111	83	55

You can use ONE single board directly in broadcast mode, or use our Art-Net proxy to convert to unicast.

In unicast mode there is no limit of boards connected.

PixelController II

Art-Net controller for LED pixels

Art-Net Network configuration:

Art-Net uses as hardware ethernet networks, their messages use UDP port 6454. There are two ranges of IPs defined for use: 2.x.x.x/8 and 10.x.x.x/8 (If you connect through a router or a computer connected to the Internet), the subnet mask should always be 255.0.0.0

The default node IP address is indicated on the label of the controller, if we use a computer as a controller needs to be set in the same IP range (eg: IP = 2.0.0.1 subnet mask = 255.0.0.0 Gateway = 2.0.0.1)

The switches we use in the network must be at least 100M or Gigabit Ethernet.

Preferably ethernet network must be exclusive use for Art-Net. There should be no Art-Net network connection to Internet (because the IP range 2.0.0.0 is also assigned on the Internet), if there is a router on network with Internet access, the packets sent to addresses Art-Net 2.x.x.x are routed to Internet, and Art-Net nodes will not work.

Node configuration using the software DMX-Workshop from Artistic Licence

To change the IP address of the node, or addresses of Art-Net universes if necessary, we will have to download the application DMX-Workshop on the Web of Artistic Licence.

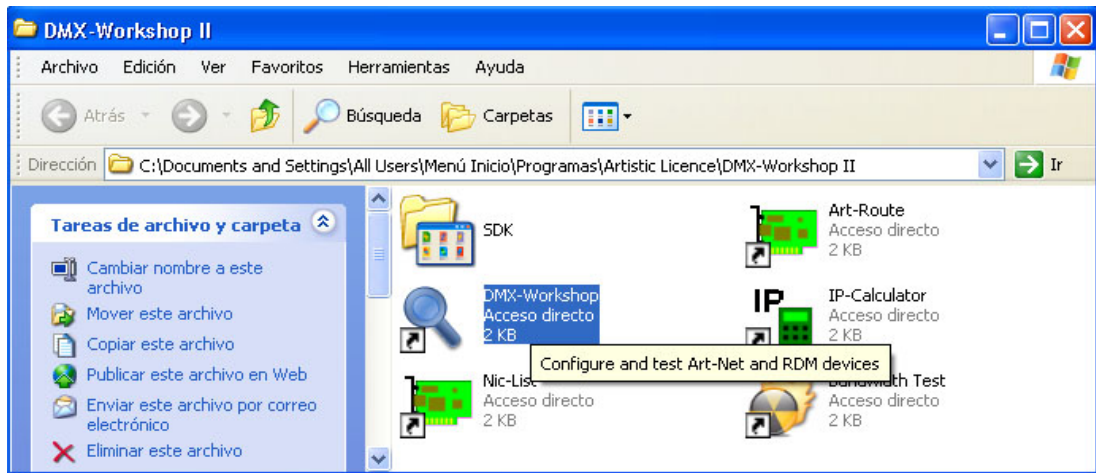
<http://www.artisticlicence.com/WebSiteMaster/Software/dmxworkshopsetup.msi>

Dmx-Workshop only works with Windows XP and Windows 7.

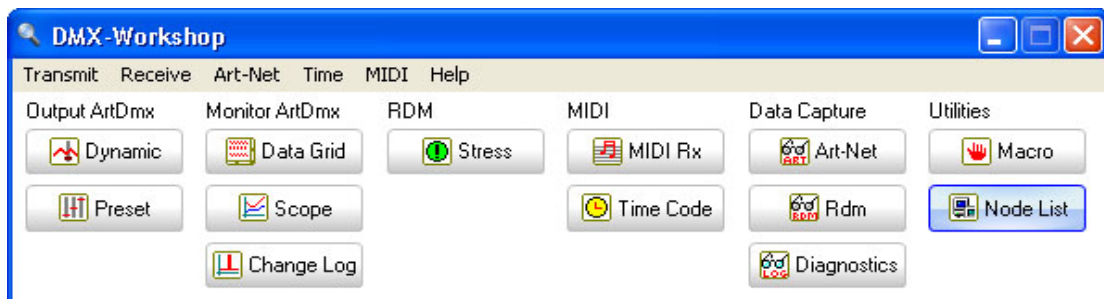
After installing the application run DMX-Workshop:

PixelController II

Art-Net controller for LED pixels



It will open a window like this:



Click on the button "Node List" and it will open a list of all nodes detected in network.

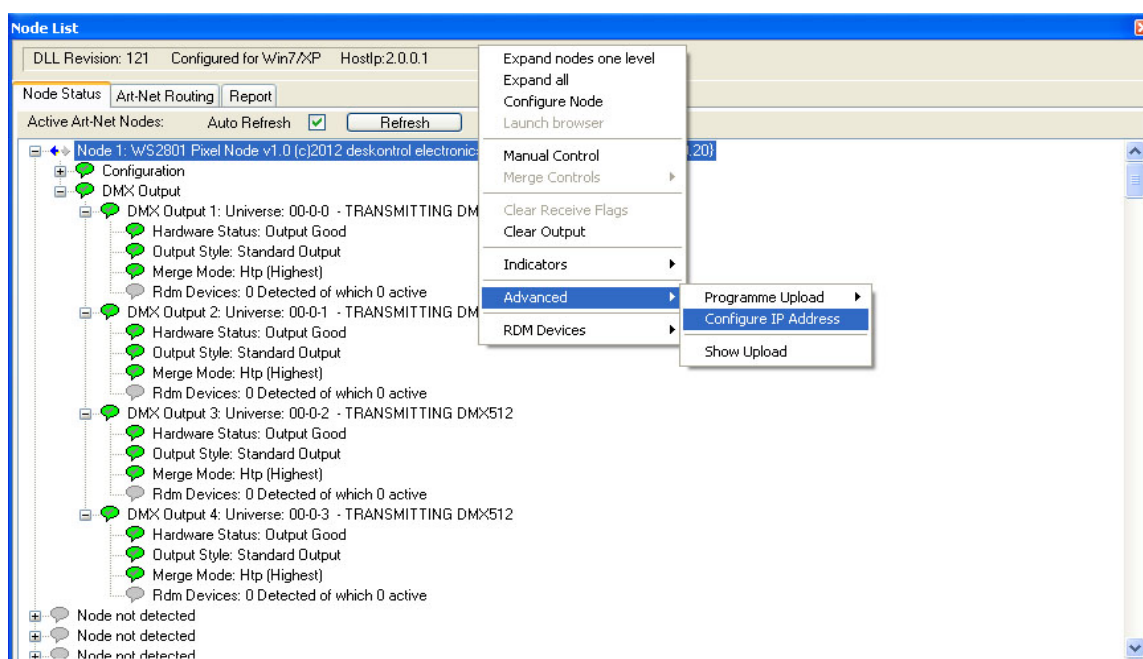
It is convenient to check the "Auto Refresh" in order to keep updated the list.

PixelController II

Art-Net controller for LED pixels

Change Art-Net node IP:

To change the IP address of a node, select it in the list, click the right mouse button, and from the context menu see the "Advanced > Configure IP address", press and open a window where you can change the IP if necessary.

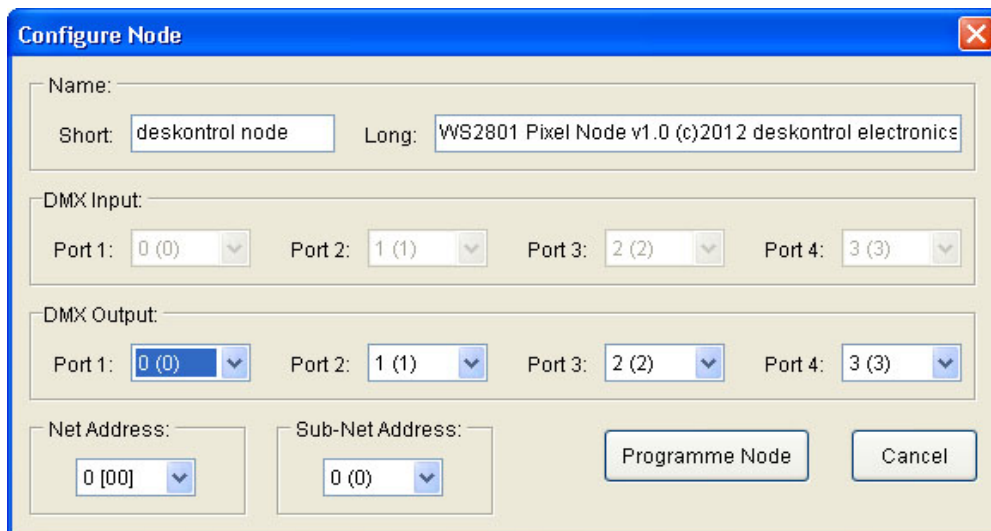
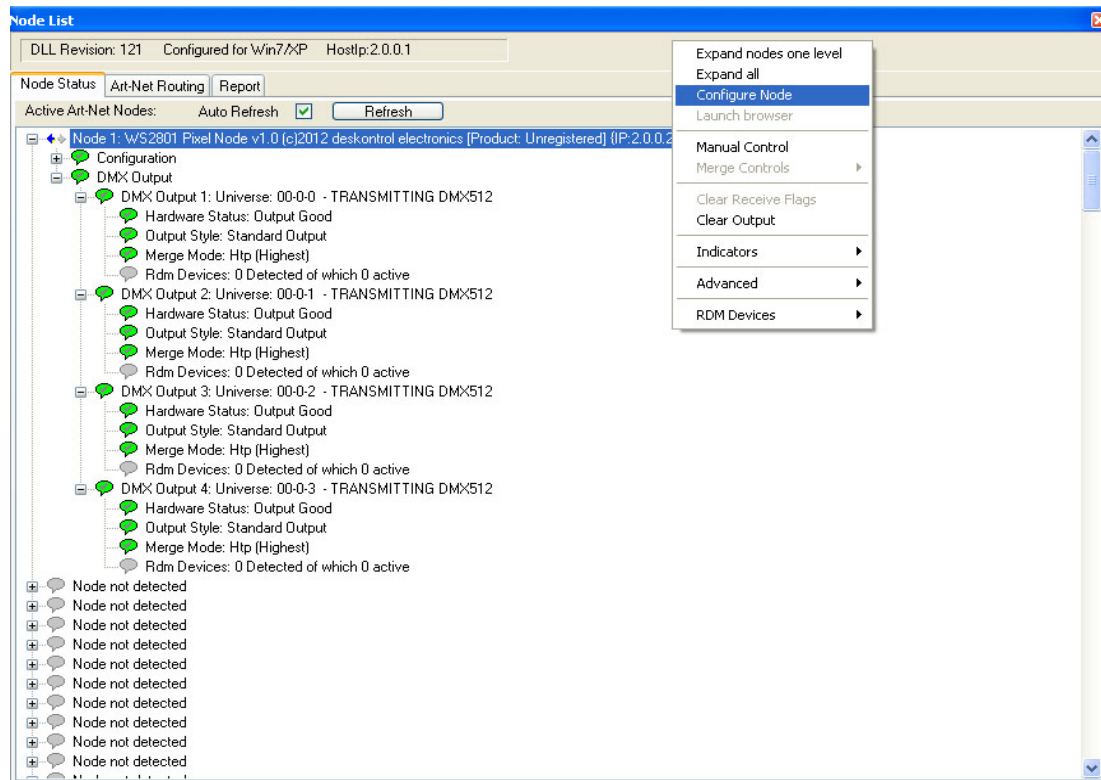


Change settings of universes:

To change values universe / subnet, we have to select the node in the list in the same way, press the right mouse button on the menu and see the "Configure Node", press it and it will open a window where you can change values universe Art-Net and Art-Net Subnet.

PixelController II

Art-Net controller for LED pixels



PixelController II

Art-Net controller for LED pixels

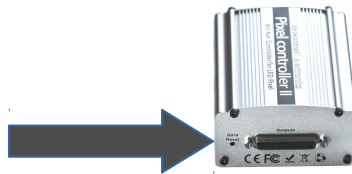
Hard Reset:

Reset the controller to factory settings

No power, press the hard reset button

Connect the power supply 6vdc and hold down the button 6 seconds

Hard reset button



Specifications:

- Power supply: 6-7,5 VDC
- Network protocol: Art-Net II Art-Net III
- Dimensions: 110 x 84 x 46 mm – 4,33" x 3,31" x 1,81" (LxWxH)
- Weight: 280 g – 9,9 ounces



This symbol on the product or in its packaging indicates that this product shall not be treated as household waste. Instead it shall be handed over the applicable collection point for the recycling of electrical and electronic equipment. By ensuring this product is disposed of correctly, you will help prevent potential negative consequences for the environment and human health, which could otherwise be caused by inappropriate waste handling of this product. The recycling of materials will help to conserve natural resources. For more detailed information about recycling this product, please contact your local city office, your household waste disposal service or the shop where you purchased the product.

- *Madrix® is a registered trademark of Inoage GmbH.*
- *Art-Net™ is a trade mark of Artistic Licence Holdings Ltd.*
- *The Art-Net protocol documentation is copyright Artistic Licence Holdings Ltd.*
- *All other company names and/or product names are trademarks and/or entered trademarks of their respective holders.*

