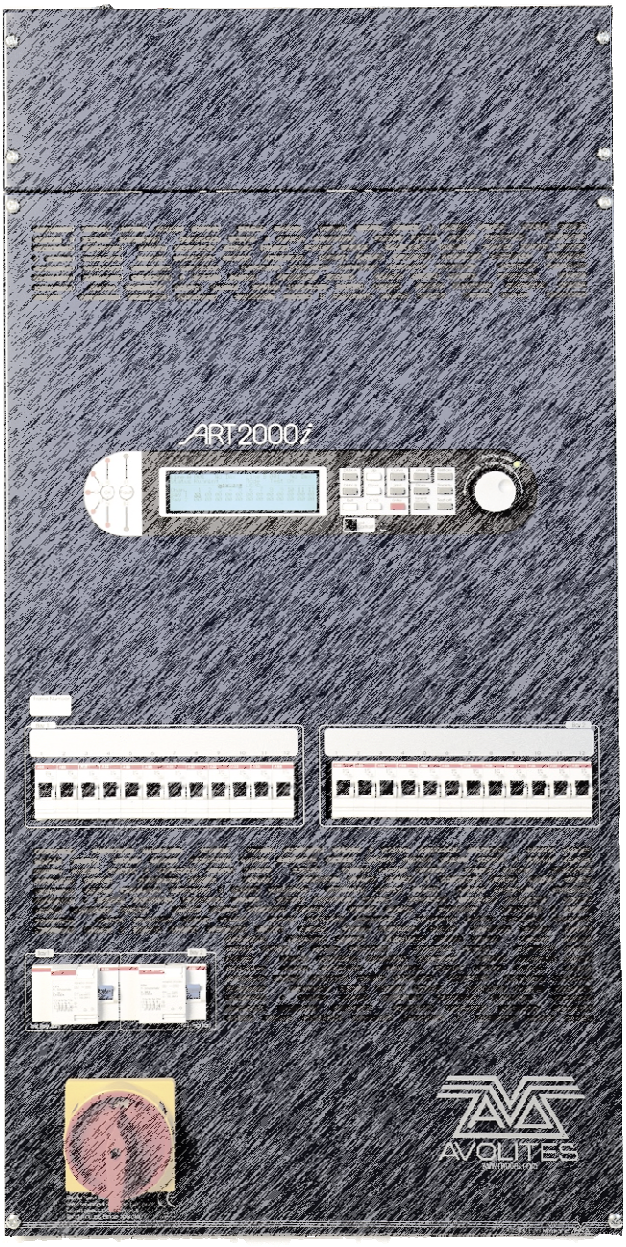
ART2000*i*

Digital Dimming System



Installation guide

Stock number 8200-0159

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0159*

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*Before contacting Avolites for service enquiry please ensure that you have the product serial number and the Software version (shown at switch on).

The latest version of this manual (MS Word 2000 & PDF) and ART2000*i* Software can be downloaded from the Internet.

The small print :

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C O N T E N T S

INTRODUCTION

1. The ART2000i installation manual

This manual is designed to explain the specifics about installing an ART2000i dimming system, this guide is not however a wiring regulation. Always consult the local wiring regulations before installing the system.

This manual is in three parts: firstly the dimmer site specifications, then the installation guide and then an appendices section containing drawings and other useful information

It is best to read the first two sections well before commencing to install dimmer system.

2. Dimmer site specifications

2.1 Dimmer site

The ART2000i dimmer is intended to be wall mounted, This can be either "on stage" or away from the stage. It is not advisable to have the dimmer in a public are, or in a location where you cannot reach it without disrupting the show. Locating the dimmer near sound equipment is not advisable.

Like any other dimmer the ART2000i dimmer generates heat, this heat needs to be vented for the system to work properly. The ART2000 system can work in a maximum ambient temperature of 40 degrees C.

2.2 Mains supply

The ART20001 requires a switched and fused mains supply near the dimmer location with the following specifications:

3-phase 5-wire star mains system with TN-S wiring system
(Phases L1,L2,L3 a neutral at ground potential and a protective earth)

Supply cable sizes are dependant on the breakers selected and can be up to 35mm2 stranded copper wire (see: Terminating the mains supply cables)

The neutral cable should be sufficient to handle the neutral currents generated by a Phase Angle Controlled Dimmer (typically up to 130% of the Maximum Phase current).

Therefore **never** fit reduced size neutral wires to supply a dimmer system

Maximum Fuse ratings:

Single frame with or without mains isolator option	125A D type breaker or equivalent fuse (this may be a fuse-disconnector) Max Icu 10Ka
Double frame system without mains isolator option	250A D type breaker or equivalent fuse (this may be a fuse-disconnector) Max Icu 10Ka
Double frame system with mains isolator option fitted	160A D type breaker or equivalent fuse (this may be a fuse-disconnector) Max Icu 10Ka

2.3 Load circuits

The wiring of the load circuit should be in accordance with the local wiring regulations. The cable gauge selected should be capable of handling the current allowed trough by the channel breaker (16A C-type, 32A C-type) and can be up to 4mm for a 16A channel in both stranded and solid copper wire and 10mm2 stranded copper wire for a 32A channel .

2.4 Ventilation

The ART2000i uses two speed controlled internal fitted fan's to regulate the heat. Fresh Air is drawn in below the breakers and warm air is expelled at the top front of the unit.

The ART2000i can operate in ambient temperatures up to 40 degrees.

The Location for the dimmer needs to be such that the expelled heat is removed. This can be either trough ventilation or through cooling (air-conditioning). If the dimmer is installed in a room without adequate ventilation the temperature will rise overtime (depending on the dimmer loading).and the dimmer may shut down if the internal temperature is to high (typically 80 °C heatsink temperature).

The ART2000i releases 25W per 16A channel run at full capacity, thus a whole rack can release a maximum of 600W (21 degrees C ambient).

The ventilation trough the dimmer displaces normally between 40 and 60 CFM per frame. This can go up to 420 CFM when running at maximum loading and ambient temperature.

3. Unpacking the dimmer

3.1 Checking for transport damage

Check for damage before opening the box, and notify the shipper and the Avolites distributor or Avolites if it is direct from factory.

Open the box by cutting the straps with a scissor, and remove the tape (do not use a sharp implement to prevent damage).

Take the manual / installation kit out.

3.2 Contents check

- ART2000i frame (main or expansion)
- Copy off Operator's manual
- Copy off Installation manual
- Allen key for opening the front panels
- Fixing set (suitable for most locations)

4. Installing

4.1 Preparing the parts

The ART2000i is shipped with the cable entry box "hooked" in place, follow the procedure below to prepare for installation:

- Remove the mains connection terminals by unscrewing the two screws holding the DIN rail, then remove the connection block
- Unscrew the two M4 and M3 retainer screws and unhook the cable entry from the main frame (slide cable entry towards the breakers by 15mm and move horizontally backwards by 20mm)
- If the cable entry has a detachable plate for cable termination remove it now.

4.2 Mounting the cable entry box

Affix the cable entry box so that it can hold at least 60Kg weight. To achieve this, use industrial type fixing (not cavity wall plugs and the like).

The non patch cable entry requires 3 fixings and one for the frame.
The patched version requires 4 fixings and one for the frame.

In concrete/good brick wall use 6mm shield anchors (bold type) or chemical anchors (6mm)

For cavity walls use the existing beams to affix or fit a load dividing cross bar to the excising vertical beams. (Ask the wall installer about the maximum load capabilities of the wall)

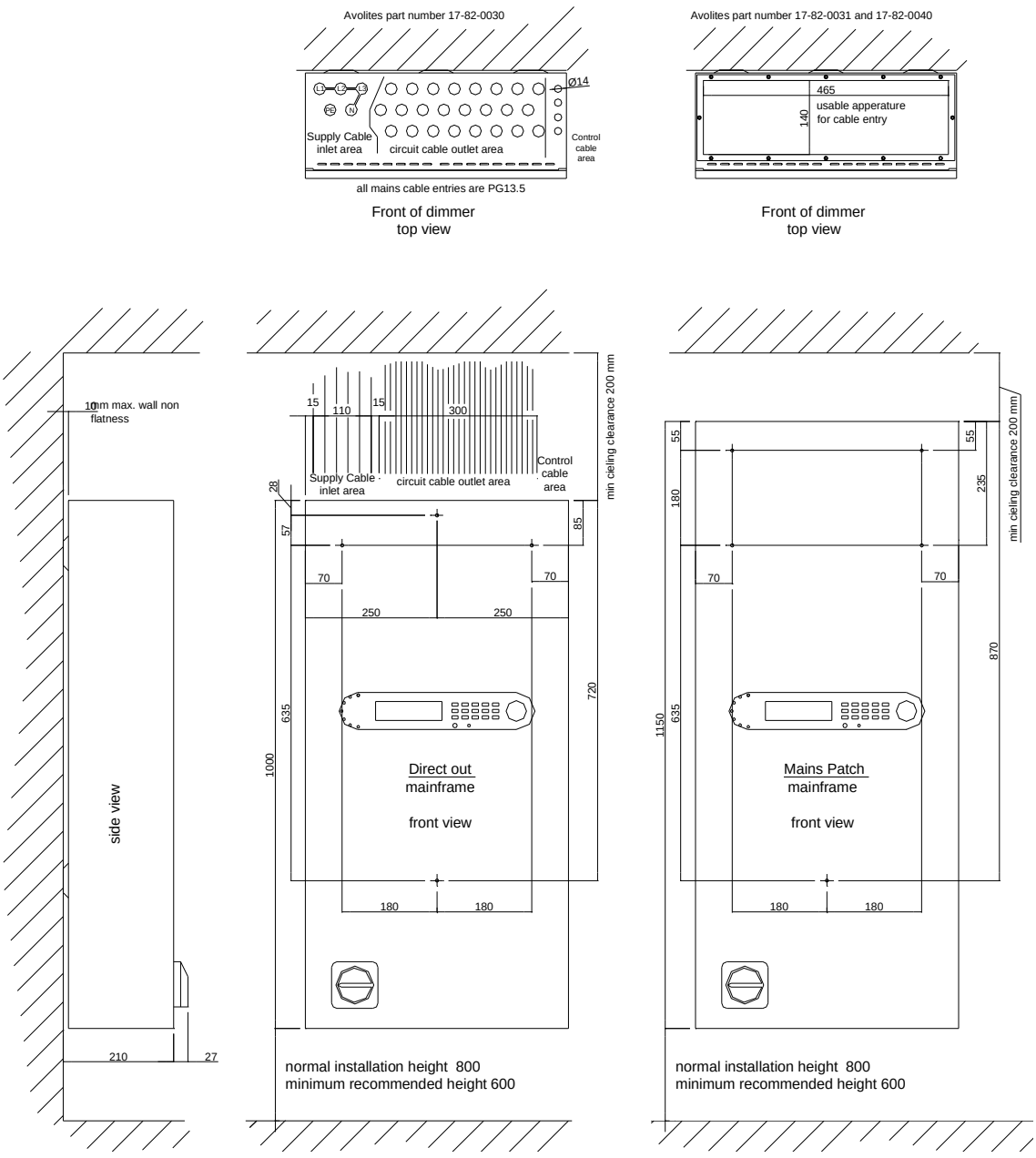
For fixing in wooden beams use a 8mm coach screws

Allow for enough space below the cable entry box to fit the dimmer frame

The fixing in the bottom of the main frame will not carry any weight; it is purely there to hold the frame to the wall.

The two M6 screws inside the bottom area of the dimmer frame can be used to align the frame to the cable entry

See drawing below for clearances and location of the fixing holes:



4.3 Preparing the optional cable entry plate

When the load cables are run through conduit or cable trays alternative holes need to be made in the cable entry. For this we have the cable plate entry. The detachable plate can be custom cut by the installer to fit the particular cable termination. Do this however in accordance with the local wiring regulations.

The cable entry plate is not a suitable earth conductor for Steel Wire Armoured cable. Always connect the SWA cable gland with an earth-tag and separate earth wire to the earth bar inside the cable entry box.

Fit the cable entry box prior to terminating any cables.

4.4 Terminating the 16A load circuits

The load circuits can now be terminated. The Connector used can accept

up to 4mm2 cables both in solid core and stranded. If stranded is used no ferrules are needed (the connector uses a plate to grip the cable)

Depending on the cable used it is usually best if the earth connections are made first.

There are two connectors fitted to each frame, the left hand connector serves channels 1-12 and the right hand connector serves channels 13-24.

Remove the connectors from the connector stands and terminate the load connections with sufficient spare cable according to the following table:

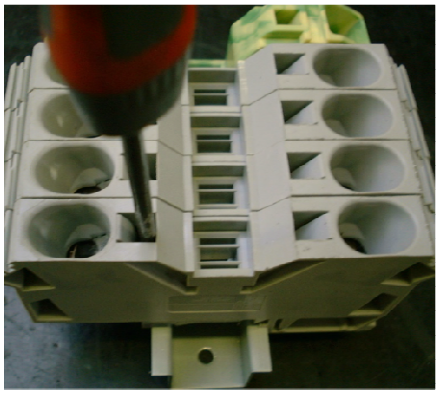
Harting Pin	Chan. Connection	Harting pin	Chan. Connection
1	Phase 1 or 13	13	Neutral 1 or 13
2	Phase 2 or 14	14	Neutral 2 or 14
3	Phase 3 or 15	15	Neutral 3 or 15
4	Phase 4 or 16	16	Neutral 4 or 16
5	Phase 5 or 17	17	Neutral 5 or 17
6	Phase 6 or 18	18	Neutral 6 or 18
7	Phase 7 or 19	19	Neutral 7 or 19
8	Phase 8 or 20	20	Neutral 8 or 20
9	Phase 9 or 21	21	Neutral 9 or 21
10	Phase 10 or 22	22	Neutral 10 or 22
11	Phase 11 or 23	23	Neutral 11 or 23
12	Phase 11 or 24	24	Neutral 11 or 24

When all connections are made fix the connector onto the connector stand so that pin 1 of the connector is on the lower left corner (pins can be seen).

4.5 Terminating the mains supply cables

The mains supply terminals can accept stranded cable up to 35mm2 stranded copper wire.

The only tool needed to fit this is a 4mm flat blade screwdriver. Insert the screwdriver and lever the handle to the centre of the terminal block, and push down. The screw driver can now be released and both hands are free to insert the cable (see picture)



Ensure that the wires are connected properly and no strands are left outside the clamp area.

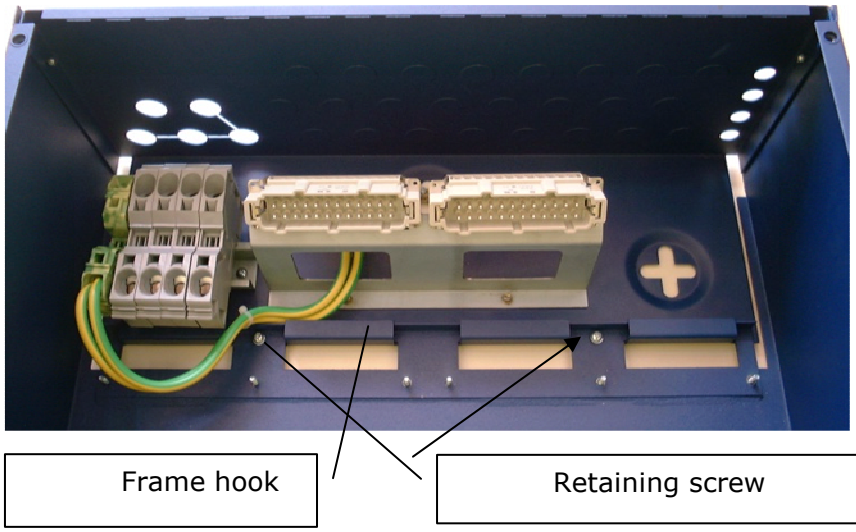
The colour code used in the ART200i is:

Red	Yellow	Blue	Black	Green/Yellow
Phase L1	Phase L2	Phase L3	Neutral	Protective earth

4.6 Hanging the dimmer module

The Dimmer main frame can now be located onto the cable entry. Use two persons to do this by lifting the module vertical over the four hanging points of the cable entry box. When the mainframe is over the hook part lower it down while pushing it flat against the wall (front to back). Check that the hooks are fully engaged. (Do **not** feel with your fingers, as they may get trapped if the unit drops into the hooks)

Fit the two M4 and M3 retaining screws , and fit the centre fixing screw into the wall.



4.7 Final installation steps

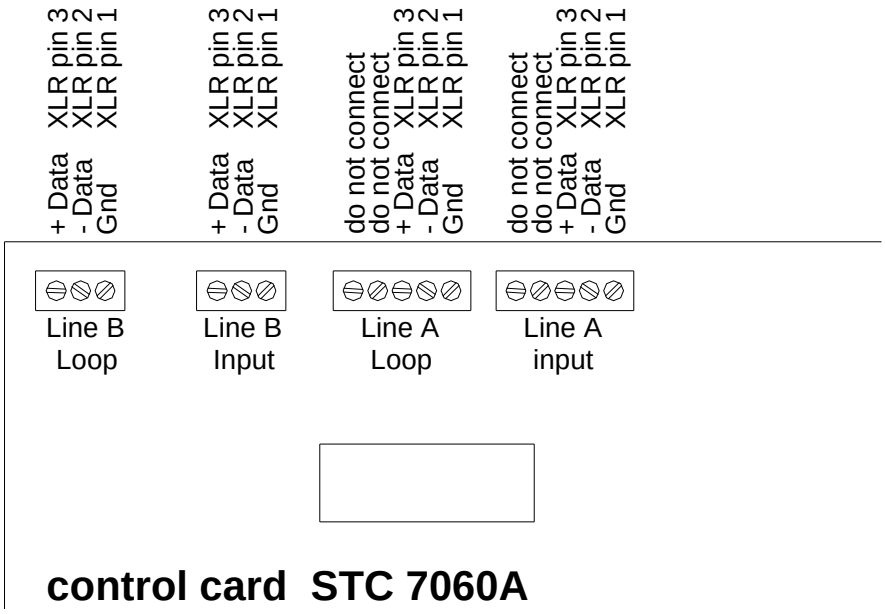
Fit the load connection connectors (24 pin Harting) from the power blocks to the cable entry connectors.

Fix the mains input terminal block to the cable entry box (using the M4 screws supplied), and terminate the module feed wires into the mains input terminals.

4.8 Terminating the DMX wiring

Route the DMX cable between the two power-blocks from the top The two DMX inputs connect to two terminal strips on the left-hand side of the control card.

The connections are:



If a termination resistor is needed (120R) for last in the line systems then fit this across the – Data Loop out and +data Loop out terminals

Do not use the Data input terminal as a loop out connection for Line A

5. Energising the system

5.1 Checking the supply wiring

Check that the supply wiring is fixed and terminated properly, also check that the right connections have been made (see terminating the mains supply).

Use a multi-meter to check for short-circuits between the phases and neutral and earth. Do not forget to switch all the breakers on during this test.

5.2 Checking the load wiring

Check that all load wires are connected and have been properly terminated on the other end. Check that all the earth wires are connected properly.

Use a multi-meter to check for short-circuits between the phases and neutral and earth

5.3 Closing the box

Fit all the front panels using the supplied Allen-key screws.

The optional mains isolator prevents the main panel from being removed or fitted if the isolator lever and body is not in the OFF position.

When closing the panels check that no cables are trapped under the panels

5.4 Energising

Switch all the breakers off on the dimmer system, and switch the optional mains isolator OFF. Make sure no load is connected yet

Energise the mains supply with the correct fuses fitted.

Check that the 5 neon's indicate a correct mains supply

The screen should now show the main menu with all channels indicating BT (Breaker Tripped)

```
Line A 001   Dmx ok    Line B 001   No Dmx
Status Running ok      Mode   Test Off
-----------BAY INPUT LEVEL--------------
Chan.   1  2  3  4  5  6  7  8  9 10 11 12
Bay 1  BT BT BT BT BT BT BT BT BT BT BT BT
Bay 2  BT BT BT BT BT BT BT BT BT BT BT BT
```

Switch the optional Bay RCB ON.

Switch the channel breakers on, the corresponding channel should change the indication from BT to NL (No Load)

The screen should now look like

```
Line A 001   Dmx ok    Line B 001   No Dmx
Status Running ok      Mode   Test Off
-----------BAY INPUT LEVEL--------------
Chan.   1  2  3  4  5  6  7  8  9 10 11 12
Bay 1  NL NL NL NL NL NL NL NL NL NL NL NL
Bay 2  NL NL NL NL NL NL NL NL NL NL NL NL
```

You can now connect loads and check that the NL disappears for each channel.

To test the channel

5.4.1 Run testing channels

➔ *Press the TEST ON button*

➔ *Select a channel to test using the encoder on the right, the selected channels is highlighted on the screen*

➔ *When the desired channel is selected press the encoder to change level of the channel.*

➔ *Pressing the encoder again allows you to select a different channel*

5.5 Load Testing

It is advisable to dry run the dimmer for at least 8 hours, with as much load as can be supplied by the mains system. Do this with persons present at the dimmer and mains supply so that if problems appear the system can be made safe.

6. Appendices

6.1 System Dimensions

6.2 Cable Sizes

Mains input:
Depending on protection fitted from 16 to 35mm2 stranded copper wire. Do not fit non-copper wire or solid wire.
Never fit a reduced size Mains neutral input cable

Load connections:
Depending on the local regulations between 1.5 and 6mm2 stranded or solid copper wire for 16A channels and 4 to 10mm2 stranded copper wire for 32A channels. Do not fit non-copper cable

6.3 The components of an ART2000i

Part Number	Description		Notes
17-82-0010	Basic Stand-Alone Mainframe		basic case, controller, lid, manuals installation kit
17-82-0011	Basic Expansion Frame		basic frame, lid, link cables, installation kit
17-82-0020	Full Wieland ST17 Patch 2 Panels		dimmer outlet panel with 48 ST17 sockets patch outlet panel with 48 Wieland ST17 sockets terminating to 4 Harting 24 Ways connectors
17-82-0021	Half Wieland ST17 Patch 2 Panels		dimmer outlet panel with 24 ST17 sockets patch outlet panel with 24 Wieland ST17 sockets terminating to 2 Harting 24 Ways connectors, empty patch sockets blanked
17-82-0022	Patch Blanking Plate 1 Panel		blank plate to cover the dimmer patch out area
17-82-0030	Non Patch Pg13.5 Cable Entry		cable entry with 24 half punched PG13.5 holes, 5 PG13.5 holes for mains inlet and 4 11mm holes for DMX input
17-82-0031	Non Patch Plate Cable Entry		cable entry with a 1.5mm thick Zintex plate for custom holes(465x140mm)
17-82-0040	Patch Plate Cable Entry		cable entry for patch versions only with a 1.5mm thick Zintex plate for custom holes(465x140mm)
17-82-0050	125a Mains Switch		pad-lockable 125A mains switch
17-82-0051	160a Mains Switch		pad-lockable 160A mains switch
17-82-0052	2 Bay RCB Option		
17-82-0060	12x 16A Dimmer Block		12 x 16A C type breaker 100% duty cycle 240µS rise time
17-82-0070	6x 32A Dimmer Block		6x 32A C type breaker 100% duty cycle 240µS rise time

6.4 The ART2000i layout