

FOR 3DS MAX 2024 · 2025 · 2026 · 2027

Vanguard Cables

Cables, wires, ropes, chains and string lights that hang the way real ones do. Click two points, or wire a whole city in one press and let a tornado tear it.

VANGUARDFX.PRO · SUPPORT@VANGUARDFX.PRO

CHAPTER 1

Getting started

What you need

- Windows 10 or 11, 64-bit.
- 3ds Max 2024, 2025, 2026 or 2027. One installer covers all four.
- Any renderer that takes a mesh: Corona, V-Ray, Arnold, Scanline, VanguardRender.
- An NVIDIA graphics card is *optional*. Tangles and **Follow the tornado** run on the GPU when there is one (about three times faster) and on the CPU otherwise, with the same result.

Install

1. **Close every running 3ds Max.** A running Max keeps the plugin file locked.
2. Download the installer from your account at vanguardfx.pro/panel.php and run `VanguardCables_Setup_1.3.3.exe`.
3. Tick the Max versions you use and finish.
4. Start Max. Open **Start › VanguardFX › Vanguard Cables Demo Scene** to see every object set up and labelled.

Activate your licence

1. Create any Vanguard Cables object and open the **Licence** rollout in the Modify panel.
2. Press **Copy** next to *Your Hardware ID*.
3. Sign in at vanguardfx.pro, paste the Hardware ID with your order and press **Download licence**.
4. Press **Load file…** in the rollout (or paste the text and press **Apply licence**). It works at once — no restart. The rollout then shows the days of updates left.

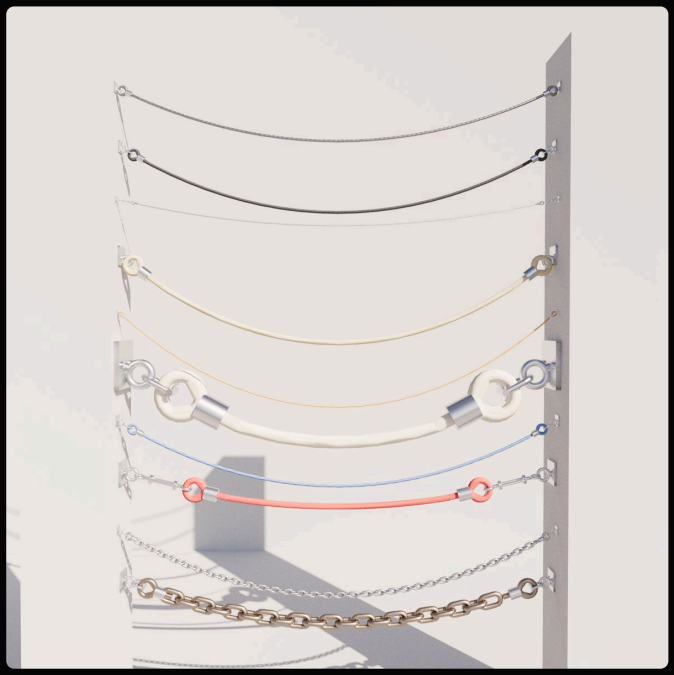
> Without a licence the plugin runs with visible limits: 3 cables per scene with one wire each and no string lights; a Tangle simulates 3 cables, a Wall run builds 3 wires, a city network renders 3 spans, and **Follow the tornado** is off. Every limited object says so in its panel.

Where it appears in Max

All objects are in **Create › Geometry › VanguardFX**. The three buttons can also go on any toolbar: **Customize › Customize User Interface › Toolbars**, category **VanguardFX**, then drag *Wire selected*, *Wire City* and *Cables follow tornado* onto a toolbar.

The four objects

OBJECT	WHAT IT IS
VanguardCable	One cable through two or more points: true catenary sag, rope, strap, chain, end fittings, parallel wires, string lights, wind.
VanguardCableRun	A loose bundle of wires clipped along walls — round a building, along a spline or painted with a brush.
VanguardCableTangle	Hundreds of cables that never pass through each other, carried by a flow. Can be wrung and torn.
VanguardCableNet	A whole city's cabling in one node — power, telephone, service drops, mess, trays. Made by *Wire the whole city*.



The ten built-in styles, from steel wire rope to heavy chain. Every one is a single VanguardCable.

Lengths are real-world: a new object is made in centimetres and converted to your scene unit, so a metre scene gets 3.5 mm wires, not metre-thick ones. **Scene scale** on every object grows or shrinks all its sizes together.

CHAPTER 2

Your first result in 5 steps

A string of lights across a terrace — the picture on the cover. Two posts (any boxes or cylinders) are all you need.

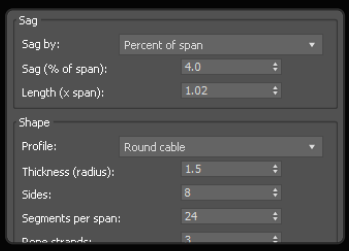


01

Create a cable and click its points

Create › Geometry › VanguardFX › VanguardCable. Click on the first post: a click on an object lands *on its surface* and the end will follow the object when it moves. Click the second post, then any more points. **Right-click to finish.**

Clicking empty space lands on the grid. Turn on Max's snaps (S) to land exactly on vertices or edges.



02

Give it the right sag

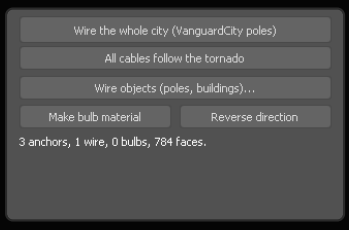
In the Modify panel, **Sag by: Percent of span** and **Sag (% of span)** = `6`. The lowest point now sits 6 % of the span below the straight line, on a true catenary. Keep **Profile: Round cable** and set **Thickness (radius)** to `0.4` cm for a thin festoon wire.



03

Turn on the bulbs

Open the **String lights** rollout and tick **String lights**. **Spacing** `30`, **Bulb size** `4`, **Hang below cable** `5`. To use your own bulb model, pick it as **Custom bulb** — its pivot is where it hangs.



04

Make them glow

In the **Tools** rollout press **Make bulb material**. It builds a Multi/Sub for the current renderer — CoronaLightMtl in Corona, VRayLightMtl in V-Ray, a glowing Physical Material elsewhere. **Brightness**, **Random brightness** and **Bulb colour** now change that material live.



05

Render

Render with any renderer: the cable is a normal mesh with UVs along its length. For a dusk shot like this one in Corona with the physical sky, set the exposure around **EV −3.5** so the sky does not burn to white. Tick **Wind sway** in the Wind rollout for a gentle loop that repeats exactly every **Loop (frames)**.

> **Rows of poles in one press.** Select poles or buildings in any order and press **Wire objects (poles, buildings)...** in the Tools rollout: one cable joins them nearest-to-nearest at their tops.

CHAPTER 3 · EVERY CONTROL

VanguardCable — the Cable rollout



The rollout as it appears in Max 2024. Lengths are shown in centimetres; they convert to your scene unit.

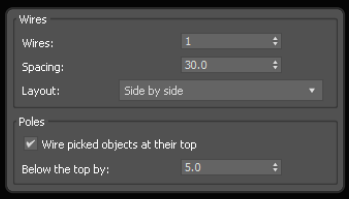
CONTROL	WHAT IT DOES · WHEN TO CHANGE IT	RANGE · DEFAULT
SAG		
Sag by	*Percent of span*: you set how far it hangs. *Cable length*: you set how long it is and the sag follows.	Percent
Sag (% of span)	Lowest point below the straight line, as % of each span. 2–5 for power lines, 6–12 for festoons.	0–100 · 5
Length (x span)	Used with *Cable length*. 1.0 is bar-taut, 1.02 a light hang, 1.2 a deep loop.	1–3 · 1.02
SHAPE		
Profile	Round cable, Twisted rope, Flat strap, Chain, Steel wire rope, Braided rope.	Round
Thickness (radius)	The cable's radius.	1 cm
Sides	Round-ness of the tube. 6 far away, 12–16 in close-up.	3–64 · 8
Segments per span	Smoothness of the curve. Capped per wire so a large count never hangs Max.	2–1000 · 24
Rope strands	Strands in Twisted / Braided rope.	2–8 · 3
Rope twist length	Length of one full twist of the strands.	20 cm
Chain link length	Size of one link of a Chain.	8 cm
STYLE		
Style	Ten ready cables, from steel wire rope and manila rope to heavy chain (see page 2). A style fills in the settings and the cable's tornado strength; change anything afterwards.	Custom
ENDS		
End fitting	Hardware at both ends: None, Eye + thimble + ferrule, Eye + shackle, Snap hook, Turnbuckle.	None
Wall plate + eye bolt	Puts the fitting on a plate screwed to the wall.	off
Fitting size x	Scales the hardware against the cable.	0.1–20 · 1
Fitting material ID	Own ID so the hardware can be metal.	3
MAPPING · SCALE		
Material ID	ID of the cable itself (bulbs use 2, fittings 3).	1
Generate mapping coords.	UVs run along the cable: U along, V round.	on
U tile length	One U tile every this many units — set it to your texture's real length.	100 cm
Scene scale x	Multiplies every size of this object at once.	0.001–1000 · 1

Anchors. A point you clicked on an object belongs to that object: move or animate the object and the cable follows. Moving the cable node moves only its free points.

CHAPTER 3 · EVERY CONTROL

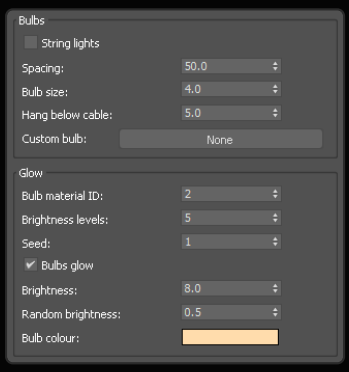
Wires, lights, wind and tools

Parallel wires



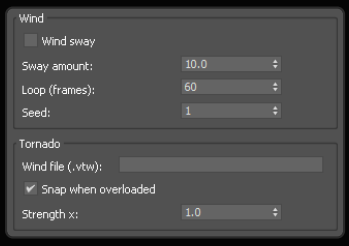
Wires	Wires per cable, for three-phase lines or bundles.	1–64 · 1
Spacing · Layout	Distance between the wires; Side by side, Stacked or Grid.	30 cm · Side
Wire picked objects at their top	*Wire objects…* attaches at the top of each pole.	on
Below the top by	Lowers that point to the crossarm under the pole top.	5 cm

String lights



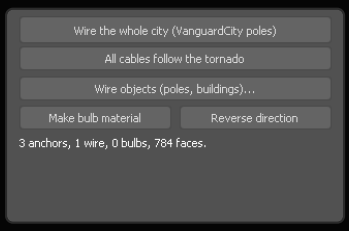
String lights	Hangs bulbs along the cable.	off
Spacing · Bulb size	Distance between bulbs (capped per wire) and size of the built-in globe.	50 · 4 cm
Hang below cable	Length of each bulb's drop.	5 cm
Custom bulb	Any mesh; its pivot is the hanging point.	None
Bulb material ID	ID of the bulbs.	2
Brightness levels · Seed	Bulbs share this many IDs of different brightness, for natural variation; Seed picks which bulb gets which.	1–32 · 5
Bulbs glow · Brightness · Random brightness · Bulb colour	Drive the material made by *Make bulb material*, live.	on · 8 · 0.5

Wind & tornado



Wind sway · Sway amount	Every span sways gently; ends never move. Amount is how far the middle travels.	off · 10 cm
Loop (frames) · Seed	The motion repeats exactly after this many frames — set it to the shot length. Seed gives a different motion.	60 · 1
Wind file (.vtw)	A VanguardTornado wind file, filled in by *All cables follow the tornado*.	empty
Snap when overloaded · Strength x	Lets the cable break; higher strength = fewer snaps.	on · 1

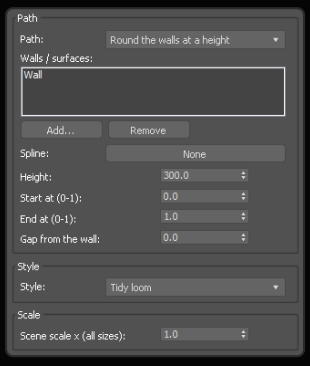
Tools



Wire the whole city	Wires every pole of the VanguardCity in the scene — nothing needs to be selected.
All cables follow the tornado	Runs every cable in the VanguardTornado's wind. Save the scene first.
Wire objects (poles, buildings)…	One cable through the selected objects, nearest to nearest.
Make bulb material · Reverse direction	A renderer-correct glowing Multi/Sub; flips the point order. The status line counts anchors, wires, bulbs and faces.

CHAPTER 3 · EVERY CONTROL

VanguardCableRun — wiring on walls



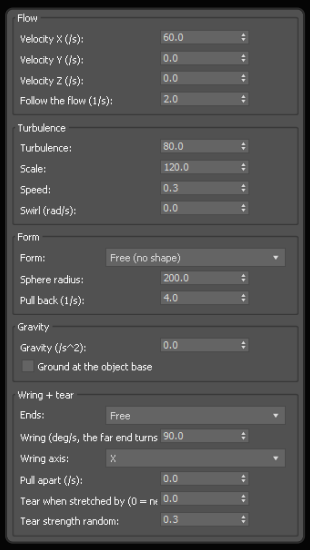
Path	*Round the walls at a height* · *Along a spline* (projected onto the walls) · *Painted with the brush* (PAINT ON A SURFACE; Ctrl+Z undoes a stroke).
Walls / surfaces	Add... the walls or the whole building. Move a wall and the run follows.
Height · Start / End at · Gap	Height for Round the walls (150 cm); trim 0–1; standoff at the clips.
Style	Tidy loom, Electrician saddle run, Old building mess, Data bundle, Power + phone, Hanging under a ceiling, Twisted bundle, Site temporary power, Industrial heavy, Dense tangle.



Wires · Wire radius · Radius random	The bundle (12 · 0.35 cm · 0.3). Each wire has its own lane, so none passes through another.
Material IDs · Bundle	Wires use IDs 1…n, clips and screws the next two. Round or Flat.
Messy · Open between clips · Sag · Twist	How wild it looks between clips (0.6 · 0.6 · 0.6 cm · 0.5).
Loose ends · Stray wires · Stray sag x	Wires hanging off the end or out of the bundle.
Clips (rollout)	Saddle clip, Zip tie or None; Spacing 40 cm, Width, Thickness, Spacing random, Missing clips (0–0.9), own clip / screw IDs.
Tornado · Contact passes	Play the tornado result, Wire strength x, Snaps when stretched by (0.06). 40 contact passes keep every wire clean.

CHAPTER 3 · EVERY CONTROL

VanguardCableTangle — cables in a flow



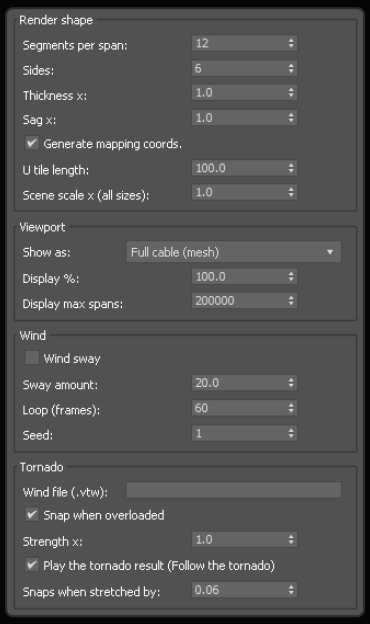
Cables · Points · Length	400 · 64 · 300 cm. 96–128 points for long cables.
Start as	Random in the box, A pile, A row (emitter), A bundle along X (for wringing).
Velocity · Follow the flow	The flow per second, and how hard cables follow it (2 /s).
Turbulence · Scale · Speed · Swirl	Noise in the flow (60 cm · 120 cm · 0.3) and rotation.
Form · Gravity · Ground	Free or Keep inside a sphere; fall; stop at the object's base.
Wring + tear	Ends Hold both / start only; Wring deg/s + axis; Pull apart; Tear when stretched by (0 = never).
Substeps · Iterations · Bend · Damping	4 · 8 · 0.3 · 0.02. Iterations 8–12 for final frames.
Live · SIMULATE · GPU	Live solves as you scrub; SIMULATE bakes the range (ESC stops); CUDA when present.



150 cables in turbulence, solved Live.

CHAPTER 3 · EVERY CONTROL

VanguardCableNet — a whole city



Press **Wire the whole city** with a VanguardCity in the scene (Poles on, City 2.1.23 or later). Five nodes appear on the layer *VanguardCables*: **Cables_Power** (ID 10), **Cables_Telephone** (11), **Cables_ServiceDrops** (12), **Cables_Messy** (13), **Cables_Trays** (14). City's own simple wires switch off.

Segments · Sides · Thickness x · Sag x	The render shape of every span at once (12 · 6 · 1 · 1).
Show as · Display % · Display max spans	Dots (lightest), Lines or Full cable in the viewport. The **render always gets full cables**.
Wind sway	As on a single cable, for the whole layer.
Snaps when stretched by	0.005 (0.5 %). Older scenes keep the value they were saved with.
Play the tornado result	Switches between the simulated and the original cables.

CHAPTER 4

Recipes

A terrace of festoon lights

Object	VanguardCable, posts clicked
Sag	Percent, 6
Thickness	0.4 cm · Sides 6
String lights	on · Spacing 30 · Bulb 4 · Hang 5
Glow	Brightness 8 · Random 0.5 · Make bulb material

A three-phase line down a road

Select	the poles, press Wire objects…
Style	Black coated wire rope
Sag	Percent, 3
Wires	3 · Spacing 60 · Side by side
Below the top by	20 cm

Old building wiring

Object	VanguardCableRun · walls added
Style	Old building mess
Path	Round the walls · Height 280
Then	Wires 24 · Missing clips 0.2 · Stray 0.15

A storm over a city

1	VanguardCity, Poles on
2	Wire the whole city
3	VanguardTornado in the streets, frames 0–96
4	Save, then All cables follow the tornado
Values	Snaps when stretched by 0.005 · Strength 1

Measured on a 10,454-pole city (58,410 spans): wiring 4.6 s, follow 71 s, 26 cables snapped. Strength x3 gave 0 snaps.

A wrung, tearing bundle

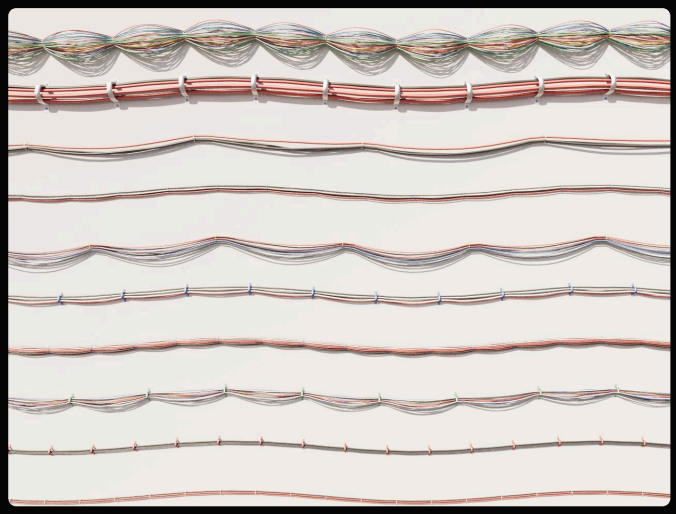
Object	VanguardCableTangle
Start as	A bundle along X · Cables 150
Ends	Hold both ends
Wring	90 deg/s · axis X
Tear when stretched by	0.05 · Live on

CHAPTER 5

Rendering & export

Every object hands the renderer a normal mesh with UVs along the length and material IDs, built only at render time. **Corona, V-Ray, Arnold, Scanline and VanguardRender** all work with any material. To export (FBX, Alembic), use *Convert to Editable Mesh* on a copy or bake with Point Cache.

- **Masks:** Object IDs 10–14 on the city layers; Cryptomatte in Corona and V-Ray by name and material.
- **Material IDs** split cable colours, clips, screws, bulbs and fittings. A city network's Multi/Sub: 1–3 power, telephone, drops; 4–6 messy colours; 7 tray metal; 8 tray cables.
- **Final quality:** city Sides 6–8, Segments 12–16 (close-up street 16–24); tangle Points 96–128, Iterations 8–12.
- **Every snap** is written to `<scene>_tornado\events.txt`, so VanguardFire and Shatter can put a spark there.



Wall run styles side by side — every look is a preset you can change afterwards.

CHAPTER 6

Troubleshooting & FAQ

YOU SEE	DO THIS
The installer cannot replace a file	A running Max has the plugin loaded. Close every Max and run it again.
A cable is empty and says "unlicensed"	Load your licence in the Licence rollout; it takes effect at once.
Wire the whole city: "no power poles"	Turn on Poles in VanguardCity (2.1.23 or later) and press it again.
Follow the tornado: "save the scene first"	Save — its wind and piece files go beside the scene in `<scene>_tornado`.
Cables move but nothing snaps	Lower *Snaps when stretched by* or *Strength x*, or move the tornado closer. A scene saved before 1.3.3 keeps the old 0.06.
Most city cables do not move	By design: only spans in wind above 6 m/s or on moving pieces are simulated, so a city takes about a minute. The rest hang still.
Poles stay standing in the tornado	The poles are part of the city mesh. Cables follow only tornado pieces or animated objects they are attached to.
The wall run says "no wall crosses that height"	Change Height or add the walls to Walls / surfaces.
A small chain link or bulb spacing looks capped	On purpose — counts are capped per wire so Max never hangs. The status line says so.
Sky burns white in Corona	Exposure about EV −3.5 with the physical sky.

CHAPTER 7

Requirements & licence

3ds Max 2024–2027 on Windows 10/11 64-bit · NVIDIA GPU optional (CUDA speeds up tangles and tornado follow) · **one licence, one computer**, tied to its Hardware ID; updates for the period on your licence · support: support@vanguardfx.pro · vanguardfx.pro

