Smart Material Changer

'Amber

Version: 2.0 PBR

PDF Document

Introduction

- It's based on script configuration instead of notecard. Faster loading/transfer speed, edits freely.
- Kernel and product functions are separated. Can support menu, HUD form, local and remote control.
- Easy to extend and no bound.
- Intelligent matching rules.

Ps: Notecard is not used for configuration because it loads too slow, so fucking slow, so fucking fucking ... slow.

Script list

Sender (KERNEL)

Script	description
SMC.KERNEL	Kernel, Material Manager, Memory.
.SMC	Configuration for KERNEL.

Client (loader)

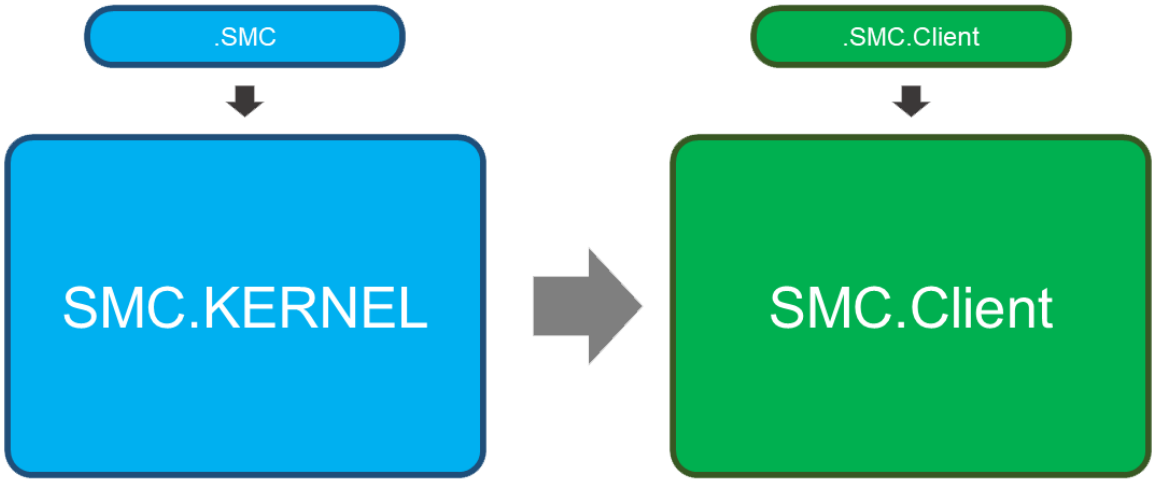
Script	description
SMC.Client	Material matching applicator. Place it into the object which material needs to be replaced. Get messages from Kernel
.SMC.Client	Configuration for SMC.Client

Others

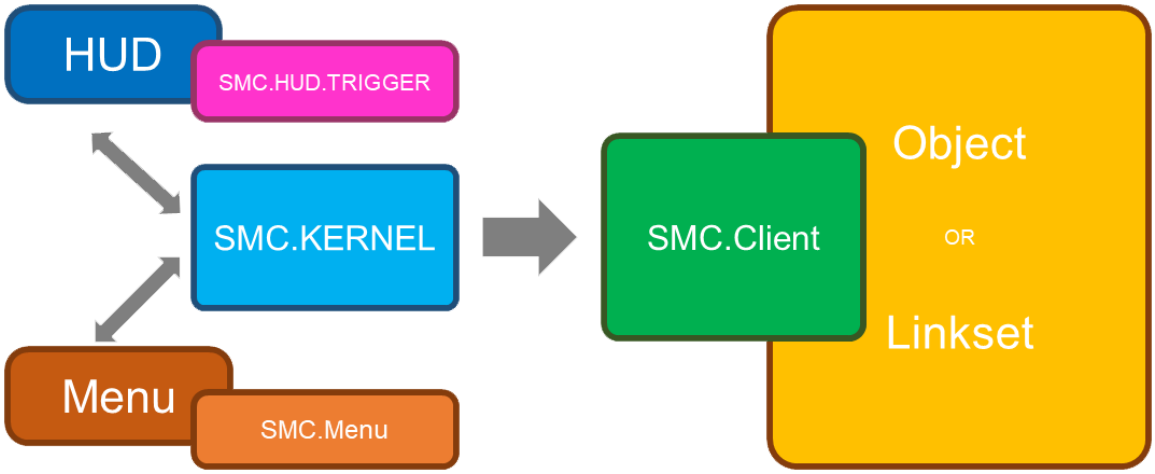
Script	description
SMC.HUD.TRIGGER	For HUD, Replace Linkset material in PART.SET format with description of the Prim
SMC.Menu	Replace material by clicking on the pop-up menu and selecting PART and SET.
.SMC.Menu	Configuration for SMC.Menu

Schema

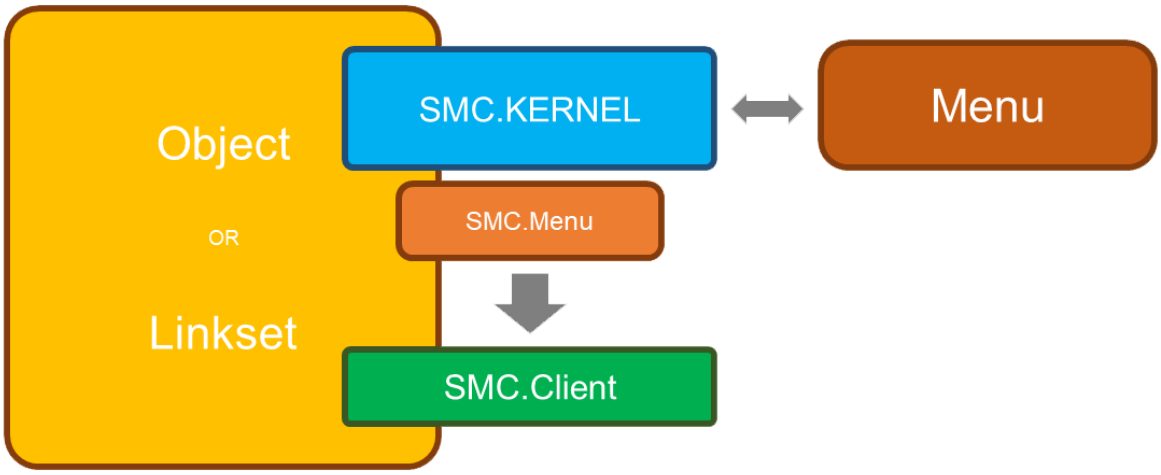
Scripting relationships



Remote



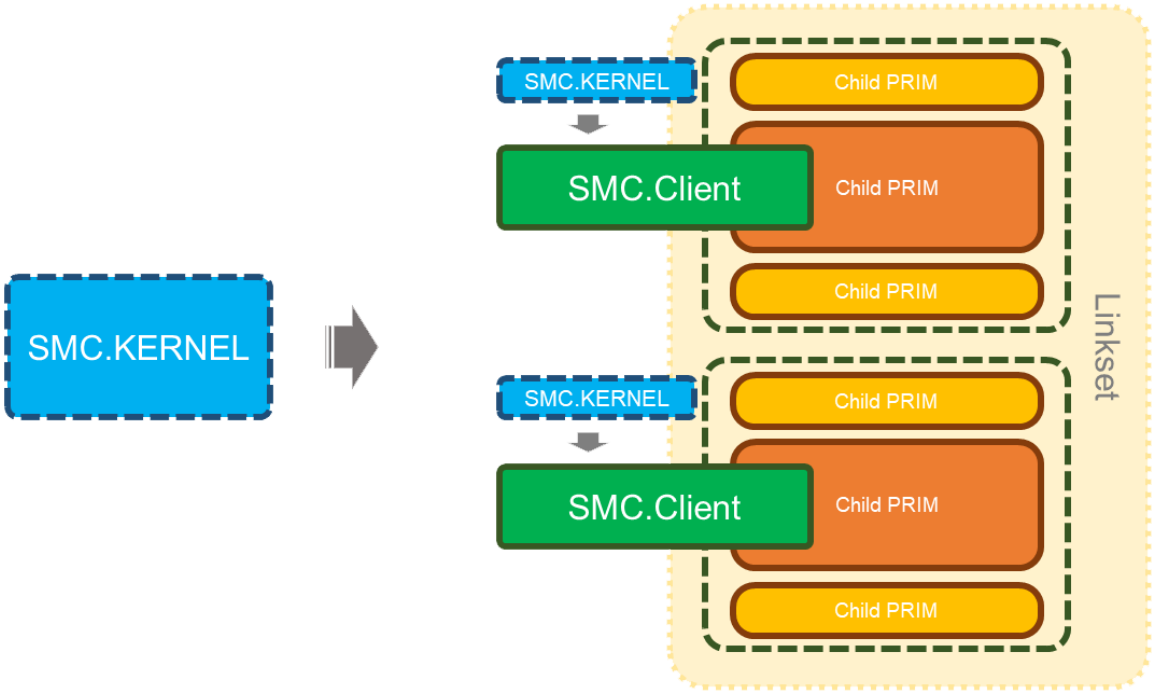
Local



Remote/Local

Multiple deployment

- **Multiple SMC.Clients can be placed in different prims in the same linkset, and they can work for their own parts, controlled by one or more SMC.KERNELs.**
- **Multiple sets of SMC.KERNEL + SMC.Client can be placed in different prims in the same linkset to control multiple sets of rules with by local.**

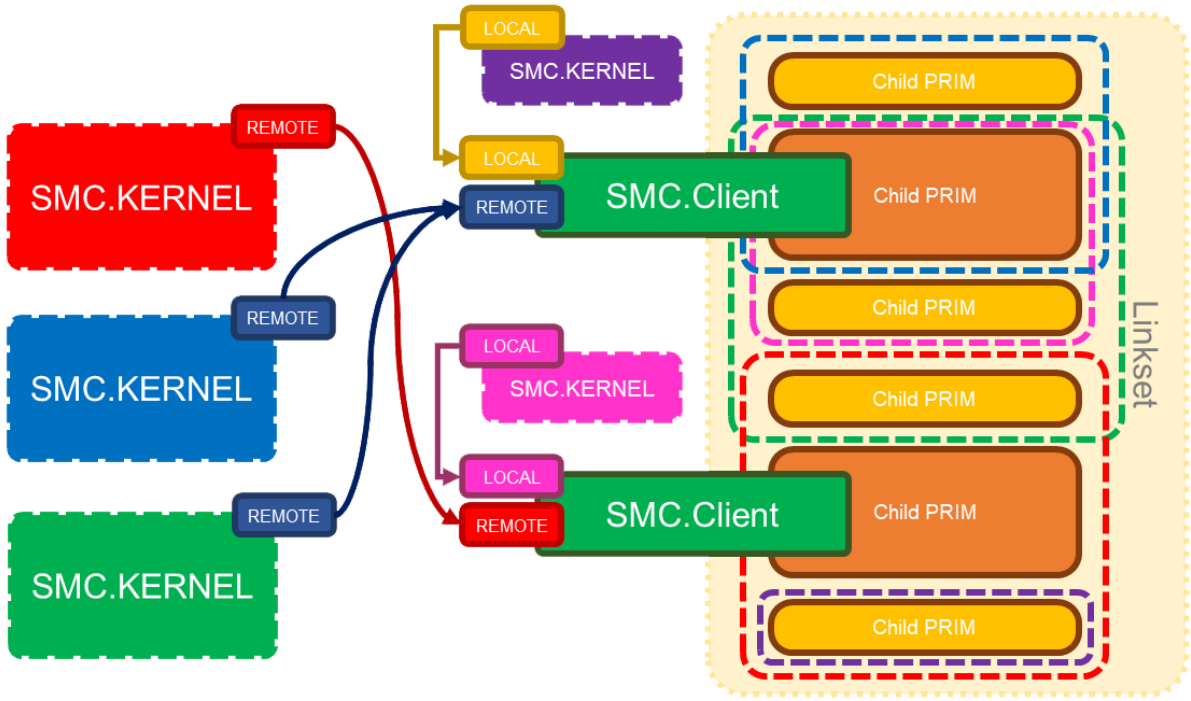


Remote/Local cross

Multiple deployment and cross control

- **Use REMOTE, LOCAL for pairing between SMC.KERNEL and SMC.Client, Allow one-to-many, many-to-one, many-to-many.**

- **Multiple KERNEL control ranges are allowed to intersect, e.g., controlling mapping and color.**



User guide

Common applications

Menu application

Click on the object, linkmessage, or gesture to bring up the menu and choose to replace the material.

- Prepare a target object to be replaced material, such as perm, mesh, or linkset.
- Put in scripts
  - SMC.KERNEL
    - .SMC
  - SMC.Client
    - .SMC.Client
  - SMC.Menu
    - .SMC.Menu
- Edit configuration information in .SMC, .SMC.Client, .SMC.Menu.
- Change the name or descrition of the Prim.
- (Recommended) **.SMC.Client**、**.SMC.Menu** You can delete it after saving it, or putting it into an object.
- (Recommended) input **/finalise** in local chat, fix the KERNEL configuration, then you can delet **.SMC**.
- Click the object to use.

The"LOCAL" in .SMC and .SMC.Client must be the same.

HUD application

Material change via HUD communication with target object, remote control.

- Prepare an object as the HUD.
- Put in script
  - SMC.KERNEL
    - .SMC
  - (options) **SMC.HUD.TRIGGER**，A sample HUD Button Click Trigger.
    - Write the defined PART and SET in the description of the HUD's buttons. Separated each by ".", such as **PartA.Style1**. The SET must be set, and the PART can be omitted. If without PART, such as：**.Style1**,the script will replace all the PART with **Style1**.

        - You can develop the trigger script for HUD, for more functions, such as slider and color picker.
- Edit configuration information in **.SMC**
- (Recommended) input **/finalise** in local chat, fix the KERNEL configuration, then you can delet **.SMC**.
- Prepare another target object to be replaced material, such as perm, mesh, or linkset.
- Put in script
    - SMC.Client
        - .SMC.Client
- (Recommended) Edit configuration in **.SMC.Client**，you can delet it after saving or putting into object.
- Rename the prim of linkset.
- Click the HUD to use.

The "REMOTE" in .SMC and .SMC.Client must be the same.

Remote Menu

Another type of remote control, base on menus instead of HUDs.

- Prepare an object that can trigger the menu
- put in scripts
    - SMC.KERNEL
        - .SMC
    - SMC.Menu
        - .SMC.Menu
- edit configuration in .SMC and .SMC.Menu
- (Recommended) **.SMC.Menu** You can delete it after saving it, or putting it into an object.
- (Recommended) input **/finalise**in local chat，fix the KERNEL configuration, then you can delet **.SMC**.
- Prepare another target object to be replaced material, such as perm, mesh, or linkset.
- Put in script
    - SMC.Client
        - .SMC.Client
- (Recommended) Edit configuration in **.SMC.Client**，you can delet it after saving or putting into object.
- Rename the prim of linkset.
- Click the HUD to use.

The "REMOTE" in .SMC and .SMC.Client must be the same.

Scenario example

A suit with HUD

- Put SMC.KERNEL into the HUD.
    - SMC.HUD.TRIGGER is optional. And it's flexible to write if you know about LSL script.
- Put SMC.Client into the suit.
- Make sure the same REMOTE in both SMC.KERNEL and SMC.Client.

A suit, with menu pops up when click on the collar

- Put SMC.KERNEL、SMC.Client、SMC.Menu into the suit。
    - You can put these scripts in ROOT or collar. That depends on where you want the menu pops up by click.
- Make sure the same LOCAL in both SMC.KERNEL and SMC.Client.

A house, with control pad. And the house and pad is linked. Menu pops up when click on.

- Put SMC.KERNEL、SMC.Client into any PRIM of the house. Set the same LOCAL for both.
- Put the SMC.Menu into the control pad, and ture on the TOUCH.

A house, with control pad. And the house and pad isn't linked. Menu pops up when click on.

- Put SMC.Client into any PRIM of the house.
- Put SMC.KERNEL、SMC.Menu into the control pad and turn on the TOUCH.
- Make sure the same REMOTE in both SMC.KERNEL and SMC.Client.

A house with 2 control pads. One is linked to the house. Another one is in your inventory, works as HUD.

- Put SMC.Client、SMC.KERNEL、SMC.Menu into any PRIM of the house, and turn on the TOUCH.
- Put SMC.KERNEL、SMC.Menu into the linked control pad, and turn on the TOUCH.
- Put SMC.KERNEL、SMC.Menu into the portable control pad HUD.
- Make sure the same LOCAL in both SMC.Client and SMC.KERNEL.
- Make sure the same REMOTE in all the SMC.KERNEL and SMC.Client.

*Attention! **SMC.HUD.TRIGGER** only works with independent **PRIM** buttons **HUD**. It depends on different name and description. It will not work with only one **PRIM**, since it **can not** recognize the touch position **(ST/UV)**. If need such function, you could write your own script.*

Configure

.SMC

Configuration	Type	Value	Default	description
DEBUG	integer	0 / 1	0	Debug mode, when enabled, outputs more information
LOCAL	integer	-2147483648 ~ 2147483647 (0 无效)	0	Local communication channels, mostly used in menu format
REMOTE	integer	-10000 ~ 10000	0	Remote Communication Channel Offset（Note: This is private channel offset, not the exact channel），mostly used in HUD format
CACHE	integer	0/1	0	Resource buffer(UUID).If there are a lot of reused images in the configuration, we recommend turnning this. It could save much RAM
RANGE	integer	0/1/2/3	0	Control distance，0:10m, 1:20m, 2:100m, 3:all region
LINES	list			Detailed writing rules will be described below

LINES

PART

Part/Target/Picker

- PART is one or many targets (prim & face), which material could be changed.It's also like a picker.
- There must be **4 parameters** after the PART.

```
list LINES = [
  PART, "{name}", {matching type}, "{matching text}", {face(es)}
];
```

Parameters	Type	Value	description
name	string	any	In a set of LINES configurations, it's not repeatable. This is one of the keys to change material. It will also work as option in local menu format
matching type	integer	table below	Describe the type of match
matching text	string/integer	any	Name or description for matching, to define with parameter 2
face(es)	string/integer	-1~7/"01234567"/ALL_SIDES	Which face of the target PRIM. Then number of PRIM(0-7). It could transfer string such as "0267". It will match mutiple face. And no need to follow the order, but can not be repetitive. You can also use ALL_SIDES(-1),and no more face then, since ALL_SIDES include every face

Matching type

Constant	Value	description
FULL	0	Match full text of the PRIM name
PREFIX	1	Match the prefix of the PRIM name
SUFFIX	2	Match the suffix of the PRIM name
SMART	3	Intelligent matching of PRIM names (temporarily unavailable)
CONST	4	In the manner of constants in SL. The matching text could be: LINK_SET, LINK_ALL_CHILDREN, LINK_ALL_OTHERS, LINK_ROOT, LINK_THIS
DFULL	10	Match full text of the PRIM description
DPREFIX	11	Match the prefix of the PRIM description
DSUFFIX	12	Match the suffix of the PRIM description
DSMART	13	Intelligent matching of PRIM description (temporarily unavailable)

Examples

Match the **3,4** faces of PRIM with named "**A**".

```
list LINES = [
  PART, "Part A", FULL, "A", "34"
];
```

Match **ALL** faces of the PRIM with prefix named **Rect**.

```
list LINES = [
  PART, "All part starting with Rect", PREFIX, "Rect", ALL_SIDES
];
```

Match the **0** face of the PRIM with suffix named **3**.

```
list LINES = [
  PART, "All part ending with 3", SUFFIX, "3", 0
];
```

Match the **1、2、5** faces of the "**PRIMs other than the one where the script in**".

```
list LINES = [
  PART, "All others", CONST, LINK_ALL_OTHERS, "125"
];
```

Match **ALL** faces of the PRIM with **description suffix "top"**.

```
list LINES = [
  PART, "TOP", DSUFFIX, "top", ALL_SIDES
];
```

SET

Color/Theme/Material scheme

- SET is a material scheme, and free to configure.

- The definition of SET cannot be independent.**It must be behind a part**.
- There are many properties in a SET. The amounts of properties parameters are different.

```
list LINES = [
  PART, ...,
  SET, {property}, ..., {property}, ..., {property}, ...
];
```

属性

Refer to PRIM_TEXTURE

Properties	Number	Corresponding Properties	Descriptions	Number of parameters	Value	Remark
D	0	PRIM_TEXTURE	Diffuse texture	1	{texture}	Only change the texture, others are inherited
DP	1	PRIM_TEXTURE	Diffuse(detail)	4	{texture}, {repeats}, {offsets}, {rotation_in_radians}	Set all properties related to diffuse reflection
N	2	PRIM_NORMAL	Normal texture	1	{texture}	Only change the texture, others are inherited
NP	3	PRIM_NORMAL	Normal(detail)	4	{texture}, {repeats}, {offsets}, {rotation_in_radians}	Set all properties related to normal mapping
S	4	PRIM_SPECULAR	Specular texture	1	{texture}	Only change the texture, others are inherited
SP	5	PRIM_SPECULAR	Specular(detail)	7	{texture}, {repeats}, {offsets}, {rotation_in_radians}, {color}, {glossiness}, {environment}	Set all properties related to gloss
C	6	PRIM_COLOR	Color	1	{color}	Color and alpha can be set separately
A	7	PRIM_COLOR	Alpha	1	{alpha}	Color and alpha can be set separately
G	8	PRIM_GLOW	Glow	1	{glow}	Light like a bulb
F	9	PRIM_FULLBRIGHT	Full bright	1	{boolean}	Turn on or off

Properties	Number	Corresponding Properties	Descriptions	Number of parameters	Value	Remark
B	10	PRIM_BUMP_SHINY	Normal and specular	2	{shiny}, {bump}	SL basic normal and specular
T	11	PRIM_TEXGEN	Mapping mode	1	{mode}	Default/Plane
M	12	PRIM_ALPHA_MODE	Alpha mode	2	{alpha_mode}, {mask_cutoff}	The 2nd parameter can not be omit, whether or not with the mask
GR	13	PRIM_RENDER_MATERIAL	Material settings	1	{render_material}	A material in the inventory of the prim this script is in or a UUID of a material
GB	14	PRIM_GLTF_BASE_COLOR	GLTF Base texture	1	{texture}	Only change the texture, others are inherited
GBC	15	PRIM_GLTF_BASE_COLOR	GLTF Base color	1	{color}	Only change the color, others are inherited
GBA	16	PRIM_GLTF_BASE_COLOR	GLTF Base alpha	1	{alpha}	Only change the alpha, others are inherited
GBM	17	PRIM_GLTF_BASE_COLOR	GLTF Base alpha mode	2	{gltf_alpha_mode}, {alpha_mask_cutoff}	Only change the alpha mode, others are inherited
GBD	18	PRIM_GLTF_BASE_COLOR	GLTF Base double sided	1	{double_sided}	Only change the double sided, others are inherited
GBP	19	PRIM_GLTF_BASE_COLOR	GLTF Base(detail)	9	{texture}, {repeats}, {offsets}, {rotation_in_radians}, {color}, {alpha}, {gltf_alpha_mode}, {alpha_mask_cutoff}, {double_sided}	Set all properties related to GLTF Base
GN	20	PRIM_GLTF_NORMAL	GLTF Normal texture	1	{texture}	Only change the texture, others are inherited

Properties	Number	Corresponding Properties	Descriptions	Number of parameters	Value	Remark
GNP	21	PRIM_GLTF_NORMAL	GLTF Normal(detail)	4	{texture}, {repeats}, {offsets}, {rotation_in_radians}	Set all properties related to GLTF Normal
GM	22	PRIM_GLTF_METALLIC_ROUGHNESS	GLTF Metallic & Roughness texture	1	{texture}	Only change the texture, others are inherited
GMM	23	PRIM_GLTF_METALLIC_ROUGHNESS	GLTF Metallic	1	{metallic_factor}	Only change the metallic, others are inherited
GMR	24	PRIM_GLTF_METALLIC_ROUGHNESS	GLTF Roughness	1	{roughness_factor}	Only change the roughness, others are inherited
GMP	25	PRIM_GLTF_METALLIC_ROUGHNESS	GLTF Metallic & Roughness(detail)	6	{texture}, {repeats}, {offsets}, {rotation_in_radians}, {metallic_factor}, {roughness_factor}	Set all properties related to GLTF Metallic & Roughness
GE	26	PRIM_GLTF_EMISSIVE	GLTF Emissive texture	1	{texture}	Only change the texture, others are inherited
GET	27	PRIM_GLTF_EMISSIVE	GLTF Emissive tint	1	{color}	Only change the tint, others are inherited
GEP	28	PRIM_GLTF_EMISSIVE	GLTF Emissive(detail)	5	{texture}, {repeats}, {offsets}, {rotation_in_radians}, {emissive_tint}	Set all properties related to GLTF Emissive

If the value is given as an empty string, it means no replacement (use the current value)

Examples

Change the diffuse reflection mapping, normal mapping with details, alpha and glow.

```
list LINES = [
  PART, ...,
  SET, "name_1", D, "{uuid}", NP, "{uuid}", <1.0, 1.0, 0.0>, <0.0, 0.0, 0.0>, 0.0, A, 0.6, G, 0.02
]
```

Change color, full bright mode, and clean the specular mapping.

```
list LINES = [
  PART, ...,
```

```
  SET, "name_2", C, <1.0, 0.0, 0.0>, F, TRUE, S, NULL_KEY
]
```

Change the positon and rotation of diffuse reflection mapping. And keep the map and repeats.

```
list LINES = [
  PART, ...,
  SET, "name_3", DP, "", "", <0.125, 0.4, 0.0>, 135.65
]
```

.SMC.Client

Configurations	Type	Values	Default	Description
DEBUG	integer	0 / 1	0	Debug mode, when enabled, outputs more information
LOCAL	integer	-2147483648 ~ 2147483647 (0 not valid)	0	Local communication channels, mostly used in menu format
REMOTE	integer	-10000 ~ 10000	0	Remote communication channel offset (Note: This is private channel offset, not the exact channel), mostly used in HUD format
DEBOUNCE	float	≥ 0.0	0.0	Anti-shake period, any changes in this period will be accumulated until there is no operation to change the material and start to work after this period, to avoid the efficiency bottleneck caused by frequent switching
CACHE	integer	0 / 1	0	Selector caching, use cache for more efficient matching speed. Note: when this option is turned on, you can't do link and unlink operation on the object, or it will be error

.SMC.Menu

Configuration Item	Type	Values	Default	Description
DEBUG	integer	0 / 1	0	Debug mode, when enabled, outputs more information
TOUCH	integer	0 / 1	0	Whether the menu can be triggered by touching
OWNER_ONLY	integer	0 / 1	0	Whether the toucher must be the owner
SETS	integer	0 / 1	0	"SETS" options, adds "[SETS]" option in the PART list, entering the SETS list menu
SETS_ON_TOP	integer	0 / 1	0	Top-level menu, replaces the PART list with the SETS list
PARTS	integer	0 / 1	0	If SETS_ON_TOP is enabled, adds "[PART]" in the SETS menu as an entry to the PART menu
MENU_OPEN_LOCAL_NUM	integer	-2147483648 ~ 2147483647 (0 invalid)	0	Local num triggering menu pop-up
MENU_BACK_LOCAL_NUM	integer	-2147483648 ~ 2147483647 (0 invalid)	0	Callback to return to the parent menu
MENU_BACK_OVERWRITE	string	Any	Empty string	Replace the return option text
MENU_PREV_OVERWRITE	string	Any	Empty string	Replace the previous page option text
MENU_NEXT_OVERWRITE	string	Any	Empty string	Replace the next page option text

Configuration Item	Type	Values	Default	Description
DIALOG_SETS	string	Any	Empty string	Set the menu content of SETS. Please use "\n" for line breaks.
DIALOG_SET	string	Any	Empty string	Set the menu content of SET. Please use "\n" for line breaks.
DIALOG_PART	string	Any	Empty string	Set the menu content of PART. Please use "\n" for line breaks.
SETS_LIST	list	key/value pairs	Empty list	See below

SETS_LIST

Formats

```
list SETS_LIST = [
  "{Set name}", "{PART}.{SET}",
  ...
];

list SETS_LIST = [
  "{Set name}", ".{SET}",
  ...
];

list SETS_LIST = [
  "{Set name}", ".{SET_A},.{SET_B},{PART1}.{SET_C},...",
  ...
];
```

Examples

```
list SETS_LIST = [
  "BLACK", ".BLACK"
];
```

```
list SETS_LIST = [
  "BLACK&RED", ".BLACK,.RED"
];
```

```
list SETS_LIST = [
  "BLACK&TOP_RED", ".BLACK,TOP.RED"
];
```

```
list SETS_LIST = [
  "BTM_B&T_R", "BOTTOM.BLACK,TOP.RED"
];
```

SMC.KERNEL Local Interface

The message string separator is "**\u2400**"

```
llDumpList2String([...], "")
```

Submit

-643323390

Apply a predefined property to a predefined part and support custom append and override

```
llMessageLinked(LINK_SET, -643323390, "{PART}{SET}[{DATA...}]", "");
```

- PART and SET must be defined in the configuration, and SET must belong to PART for this commit to work.
- The DATA part is an append or override attribute, written as in SET, optional parameters.

Examples

```
// Most commonly used (using predefined configuration LINES)
llMessageLinked(LINK_SET, -643323390, "TOPBLACK", "");
// with customized properties
llMessageLinked(LINK_SET, -643323390, "TOPBLACK6<1.0, 0.0, 0.0>9TRUE4ee509dfd-0974-6fb5-3eea-
2504fa13ef4c", "");
// Easy style
llMessageLinked(LINK_SET, -643323390, llDumpList2String(["TOP", "BLACK", 6, <1.0, 0.0, 0.0>, 9, TRUE, 4,
"ee509dfd-0974-6fb5-3eea-2504fa13ef4c"], ""), "");
// It is recommended to use constants, which can be written as
llMessageLinked(LINK_SET, -643323390, llDumpList2String(["TOP", "BLACK", C, <1.0, 0.0, 0.0>, F, TRUE, S,
"ee509dfd-0974-6fb5-3eea-2504fa13ef4c"], ""), "");
```

* Batch mode

```
llMessageLinked(LINK_SET, -643323390, "{SET}", "");
```

- If with no PART, the full match mode will be triggered at this point, and all PARTs containing the SET will be automatically found, and work together.
- The DATA appended at this moment, will be applied to all relevant PARTs.

Examples

```
// In the defined PART, such as TOP, MIDDLE and BOTTOM.
// If there is BLACK in TOP and MIDDLE, those will be found automatically and BLACK will be applied.
// The same with carrying out TOPBLACK and MIDDLEBLACK
llMessageLinked(LINK_SET, -643323390, "BLACK", "");
```

-643323392

Apply a customized set of attributes to predefined parts

```
llMessageLinked(LINK_SET, -643323392, "{PART}{DATA...}", "");
```

- PART must have been defined in the configuration for this commit to work.
- The writing style of DATA, such as properties in SET, is different with those above for the custom properties of PART.

Examples

```
llMessageLinked(LINK_SET, -643323392, "TOP🌐6🌐<1.0, 0.0, 0.0>🌐9🌐TRUE🌐4🌐ee509dfd-0974-6fb5-3eea-
2504fa13ef4c", "");
// Easy style
llMessageLinked(LINK_SET, -643323392, llDumpList2String(["TOP", 6, <1.0, 0.0, 0.0>, 9, TRUE, 4,
"ee509dfd-0974-6fb5-3eea-2504fa13ef4c"], "🌐"), "");
// It is recommended to use constants, which can be written as
llMessageLinked(LINK_SET, -643323392, llDumpList2String(["TOP", C, <1.0, 0.0, 0.0>, F, TRUE, S,
"ee509dfd-0974-6fb5-3eea-2504fa13ef4c"], "🌐"), "");
```

-643323393

Apply a set of custom properties to a customized part.

```
llMessageLinked(LINK_SET, -643323393, "{DATA...}", "");
```

- DATA must be with the full PART + SET contents.
- No need to follow the configuration, this is a completely independent selection + properties rule.

Examples

```
llMessageLinked(LINK_SET, -643323393, "2🌐top🌐0123🌐6🌐<1.0, 0.0, 0.0>🌐9🌐TRUE🌐4🌐ee509dfd-0974-6fb5-
3eea-2504fa13ef4c", "");
// Easy style
llMessageLinked(LINK_SET, -643323393, llDumpList2String([2, "top", "0123", 6, <1.0, 0.0, 0.0>, 9, TRUE,
4, "ee509dfd-0974-6fb5-3eea-2504fa13ef4c"], "🌐"), "");
// It is recommended to use constants, which can be written as
llMessageLinked(LINK_SET, -643323393, llDumpList2String([SUFFIX, "top", "0123", C, <1.0, 0.0, 0.0>, F,
TRUE, S, "ee509dfd-0974-6fb5-3eea-2504fa13ef4c"], "🌐"), "");
```

Request(pull back)

-643323410

Request PART List

```
llMessageLinked(LINK_SET, -643323410, "", id);
```

KERNEL callback: **-643323411**

```
  llMessageLinked({SENDER}, -643323411, "{PART1}🌐{PART2}🌐....", id);
```

-643323420

Request SET List

```
llMessageLinked(LINK_SET, -643323420, "{SET}", id);
```

KERNEL callback: **-643323411**

```
  llMessageLinked({SENDER}, -643323421, "{SET1}🌐{SET2}🌐....", id);
```

* Special thanks to my darling **Amber0089**