# RS485 RTS TRANSMITTER
# Profile
## SOMFY RS485 Protocol

| Revision | Object | Author | Date |
|---|---|---|---|
| 0.0 **R0** | First draft based on specifications | A.Millet | 2008/08/21 |
| 0.4 **R1** | Updates. Version for the product's commercial launching. | V. Vanderschaeve | 2009/06/19 |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

## TABLE OF CONTENT

# 1 Introduction

This document applies to SOMFY ***RS485 RTS TRANSMITTER*** as described in SDEV-CDCF 176:

***Product perimeter***
The RS485 RTS transmitter is a 16 channels U80 RTS transmitter that enables a 3rd party (home automation control system) to control SOMFY RTS motors and receivers.

***Applications***
The interface is compatible with all RTS applications:

- Roller shutters
- Awnings
- Black-out shades
- Internal & External Screens
- Curtains
- Interior venetian blinds
- Lighting receivers
- Projection screens.

# 2 Functions

The following table shows functions available from the network (according to SDV-CDCF 176 ANNEXE 6) and the corresponding messages:

| Command Type | Function | Message | In / Out |
|---|---|---|---|
| Setting | Affect specific behavior by channel | SET_CHANNEL_MODE (90h) | >> In |
| | Fix number of frames for TILT | SET_TILT_FRAMECOUNT (91h) | >> In |
| | Fix number of frames for DIM | SET_DIM_FRAMECOUNT (92h) | >> In |
| | SUN Auto On | SET_SUN_AUTO (93h) | >> In |
| | SUN Auto Off | | |
| | “lock/unlock” dry contact | SET_DCT_LOCK (94h) | >> In |
| | Prog | SET_CHANNEL (97h) | >> In |
| | Open prog Mode | SET_OPEN_PROG (98h) | >> In |
| | RECORD/DELETE AN IP | SET_IP (9Ah) | >> In |
| Control | Move UP / Light ON | CTRL_POSITION (80h) | >> In |
| | Move DOWN / Light OFF | | |
| | STOP Movement | | |
| | Move to favorite position / ON with favorite light position | | |
| | Tilt + | CTRL_TILT (81h) | >> In |
| | Tilt - | | |
| | DIM + | CTRL_DIM (82h) | >> In |
| | DIM - | | |

| | | | |
|---|---|---|---|
| Status | Retrieve Mode of channels | GET_CHANNEL_MODE (A0h) | >> In |
| | | POST_CHANNEL_MODE (B0h) | Out >> |
| | Retrieve Tilt FrameCount | GET_TILT_FRAMECOUNT (A1h) | >> In |
| | | POST_ TILT_FRAMECOUNT (B1h) | Out >> |
| | Retrieve Dim FrameCount | GET_DIM_FRAMECOUNT (A2h) | >> In |
| | | POST_ DIM_FRAMECOUNT (B2h) | Out >> |
| | Retrieve Lock Status | GET_DCT_LOCK(A4h) | >> In |
| | | POST_ DCT_LOCK (B4h) | Out >> |

# 3 Applicable Standards

## 3.1 Functional Standards

- n/a

## 3.2 Technical Standards

- GME-STD-062 ILT Protocol overview
- GME-STD-063 RS485 Physical Layer
- GME-STD-064 ILT@ Data-Link Layer
- GME-STD-065 ILT Standard Messages

| Product designation | NodeType / AppID | Node Family |
|---|---|---|
| RS485 RTS TRANSMITTER | 05h | SLAVE |

| Address Range | |
|---|---|
| 05:80:00 | 05:FF:FF |

Typical Response time of the transmitter is from 5 to 10 ms.
Regarding Specific frames, mainly the ones that trigger an RTS Transmission (80h, 81h, 82h), the typical response time is from 100 to 110 ms.

# 4 Table of Supported Messages

## *4.1 Mandatory Messages*

Mandatory messages are used for basic networking features: address / group / acknowledgment / diagnosis / software information.
Definition of these messages can be found in GME-STD 065 “ILT Standard Messages”.

| MSG In | MSG Out | Name | Description |
|---|---|---|---|
| 40h | | GET_NODE_ADDR | Read NodeID / AppID |
| | 60h | POST_NODE_ADDR | Send NodeID / AppID on network |
| 41h | | GET_GROUP_ADDR | Read NodeID of designated group (1 on 16) |
| 51h | | SET_GROUP_ADDRESS | Write NodeID of designated group (1 on 16) |
| | 61h | POST_GROUP_ADDR | Send NodeID of designated group (1 on 16) |
| 45h | | GET_NODE_LABEL | Read Label of the node |
| 55h | | SET_NODE_LABEL | Write Label of the node |
| | 65h | POST_NODE_LABEL | Send Label of the node |
| 4Ch | | GET_SERIAL_NUMBER | Read Serial Number of the node |
| | 6Ch | POST_SERIAL_NUMBER | Send Serial Number of the node |
| 4Dh | | GET_NETWORK_ERROR_STAT | Read Error counter of the stack |
| | 6Dh | POST_NETWORK_ERROR_STAT | Send Error counter of the stack |
| 4Eh | | GET_NETWORK_STAT | Read network communication diagnosis |
| 5Eh | | SET_NETWORK_STAT | Configure and reset diagnosis counters |
| | 6Eh | POST_NETWORK_STAT | Send network communication diagnosis |
| | 6Fh | NACK | Send acknowledgment with error code |
| 70h | | GET_NODE_STACK_VERSION | read version of the stack |
| | 71h | POST_NODE_STACK_VERSION | send version of the stack |
| 74h | | GET_NODE_APP_VERSION | read version of the software |
| | 71h | POST_NODE_APP_VERSION | send version of the software |
| | 7Fh | ACK | Send acknowledgment |

## 4.2 ILT Standard Messages Compatibility (40h – 7Fh)

| | 40h | | 50h | | 60h | | 70h |
|---|---|---|---|---|---|---|---|
| 40 | GET_NODE_ADDR | 50 | | 60 | POST_NODE_ADDR | 70 | GET_NODE_SW_VERSION |
| 41 | GET_GROUP_ADDR | 51 | SET_GROUP_ADDR | 61 | POST_GROUP_ADDR | 71 | POST_NODE_SW_VERSION |
| 42 | | 52 | | 62 | | 72 | |
| 43 | | 53 | | 63 | | 73 | |
| 44 | | 54 | | 64 | | 74 | GET_NODE_APP_VERSION |
| 45 | GET_NODE_LABEL | 55 | SET_NODE_LABEL | 65 | POST_NODE_LABEL | 75 | POST_NODE_APP_VERSION |
| 46 | | 56 | | 66 | | 76 | |
| 47 | | 57 | | 67 | | 77 | |
| 48 | | 58 | | 68 | | 78 | |
| 49 | | 59 | | 69 | | 79 | |
| 4A | | 5A | | 6A | | 7A | |
| 4B | | 5B | | 6B | | 7B | |
| 4C | GET_NODE_SERIAL_NUMBER | 5C | | 6C | POST_NODE_SERIAL_NUMBER | 7C | |
| 4D | GET_NETWORK_ERROR_STAT | 5D | | 6D | POST_NETWORK_ERROR_STAT | 7D | |
| 4E | GET_NETWORK_STAT | 5E | SET_NETWORK_STAT | 6E | POST_NETWORK_STAT | 7E | |
| 4F | | 5F | | 6F | NACK | 7F | ACK |

# 5 Application-specific Messages

## *5.1 Messages Table*

| | 80h | | 90h | | A0h | | B0h |
|---|---|---|---|---|---|---|---|
| 80h | CTRL_POSITION | 90h | SET_CHANNEL_MODE | A0h | GET_CHANNEL_MODE | B0h | POST_CHANNEL_MODE |
| 81h | CTRL_TILT | 91h | SET_TILT_FRAMECOUNT | A1h | GET_TILT_FRAMECOUNT | B1h | POST_TILT_FRAMECOUNT |
| 82h | CTRL_DIM | 92h | SET_DIM_FRAMECOUNT | A2h | GET_DIM_FRAMECOUNT | B2h | POST_DIM_FRAMECOUNT |
| | | 93h | SET _SUN_AUTO | | | | |
| | | 94h | SET_DCT_LOCK | A4h | GET_DCT_LOCK | B4h | POST_DCT_LOCK |
| | | | | | | | |
| | | | | | | | |
| | | 97h | SET_CHANNEL | | | | |
| | | 98h | SET_OPEN_PROG | | | | |
| | | | | | | | |
| | | 9Ah | SET_IP | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

## 5.2 Setting Functions

### 5.2.1 SET_CHANNEL_MODE (90h)

➢ Set the modes to use for the selected channel. This mode is used to determine the number of RTS frame to send on **CTRL_POSITION** and **CTRL_TILT** Orders.

| MSG | Name | DATA Length | FRAME Length | Addressing | | |
|---|---|---|---|---|---|---|
| 90h | SET_CHANNEL_MODE | 4 | 15 | P2P | GROUP | BROADCAST |

| DATA | TYPE | MIN | MAX | Description |
|---|---|---|---|---|
| Channel Number | Byte | 0 | 15 | Channel to set |
| US/CE mode | Byte | 0 | 1 | Used for UP/DOWN/TILT |
| Rolling/Tilting Mode | Byte | 0 | 1 | Used for UP/DOWN |
| Modulis Mode | Byte | 0 | 1 | Used for motors/receivers compatible with Modulis = tilting or dimming |

| US/CE mode | Description | Remarks |
|---|---|---|
| 00h | CE mode | |
| 01h | US Mode | Default |

| Rolling/Tilting Mode | Description | Remarks |
|---|---|---|
| 00h | Rolling mode | Default |
| 01h | Tilting Mode | |

| Modulis Mode | Description | Remarks |
|---|---|---|
| 00h | Normal mode | |
| 01h | Modulis Mode | Default |

### 5.2.2 SET_TILT_FRAMECOUNT (91h)

➢ Set the number of RTS frames the product should send on a **CTRL_TILT** order.

| MSG | Name | DATA Length | FRAME Length | Addressing | | |
|---|---|---|---|---|---|---|
| 91h | SET_TILT_FRAMECOUNT | 3 | 14 | P2P | GROUP | BROADCAST |

| DATA | TYPE | MIN | MAX | Description |
|---|---|---|---|---|
| Channel Number | Byte | 0 | 15 | Channel to set |
| Number of frames to send for US mode | Byte | 4 | 255* | Default Value: 5 |
| Number of frames to send for CE mode | Byte | 2 | 13 | Default Value: 2 |

*Remark: the number of frames will be effectively limited to 10 seconds of sending.

### 5.2.3 SET_DIM_FRAMECOUNT (92h)

➢ Set the number of RTS frames the product should send on a **CTRL_DIM** order.

| MSG | Name | DATA Length | FRAME Length | Addressing | | |
|---|---|---|---|---|---|---|
| 92h | SET_DIM_FRAMECOUNT | 2 | 13 | P2P | GROUP | BROADCAST |

| DATA | TYPE | MIN | MAX | Description |
|---|---|---|---|---|
| Channel Number | Byte | 0 | 15 | Channel to set |
| Number of frames to send | Byte | 4 | 255* | Default Value: 5 |

*Remark: the number of frames will be effectively limited to 10 seconds of sending.

### 5.2.4 SET_SUN_AUTO (93h)

➢ Send RTS ON/OFF orders to the selected output.

| MSG | Name | DATA Length | FRAME Length | Addressing | | |
|---|---|---|---|---|---|---|
| 93h | SET_SUN_AUTO | 2 | 13 | P2P | GROUP | BROADCAST |

| DATA | TYPE | MIN | MAX | Description |
|---|---|---|---|---|
| Channel Number | Byte | 0 | 15 | Channel to use for RTS |
| Function | Byte | 0 | 1 | |

| Function | Description | Remarks |
|---|---|---|
| 00h | SET Sun Auto ON | |
| 01h | SET Sun Auto OFF | |

### 5.2.5 SET_DCT_LOCK (94h)

➢ Signal to product that actions on specified DCT should not be routed through RTS layer.

| MSG | Name | DATA Length | FRAME Length | Addressing | | |
|---|---|---|---|---|---|---|
| 94h | SET_DCT_LOCK | 2 | 13 | P2P | GROUP | BROADCAST |

| DATA | TYPE | MIN | MAX | Description |
|---|---|---|---|---|
| DCT Index | Byte | 0x00 | 0x05 | |
| Function | Byte | 0x00 | 0x01 | |

| DCT Index | Description | Remarks |
|---|---|---|
| 0x00 | All | Lock/Unlock all DCTs |
| 0x01 | DCT1 | Lock/Unlock DCT1 |
| 0x02 | DCT2 | Lock/Unlock DCT2 |
| 0x03 | DCT3 | Lock/Unlock DCT3 |
| 0x04 | DCT4 | Lock/Unlock DCT4 |
| 0x05 | DCT5 | Lock/Unlock DCT5 |

| Function | Description | Remarks |
|---|---|---|
| 0x00 | Unlock | |
| 0x01 | Lock | |

### 5.2.6 SET_CHANNEL (97h)

➢ Send RTS Prog frames to a receiver

| MSG | Name | DATA Length | FRAME Length | Addressing | | |
|---|---|---|---|---|---|---|
| 97h | SET_CHANNEL | 1 | 12 | P2P | GROUP | BROADCAST |

| DATA | TYPE | MIN | MAX | Description |
|---|---|---|---|---|
| Channel Number | Byte | 0 | 15 | Channel number to set for RTS |

### 5.2.7 SET_OPEN_PROG (98h)

➢ Send RTS Prog frames to a receiver

| MSG | Name | DATA Length | FRAME Length | Addressing | | |
|---|---|---|---|---|---|---|
| 98h | SET_OPEN_PROG | 1 | 12 | P2P | GROUP | BROADCAST |

| DATA | TYPE | MIN | MAX | Description |
|---|---|---|---|---|
| Channel Number | Byte | 0 | 15 | Channel number to set for RTS |

### 5.2.8 SET_IP (9Ah)

➢ Send RTS Record/Delete IP order to the selected output.

| MSG | Name | DATA Length | FRAME Length | Addressing | | |
|---|---|---|---|---|---|---|
| 9Ah | SET_IP | 1 | 12 | P2P | GROUP | BROADCAST |

| DATA | TYPE | MIN | MAX | Description |
|---|---|---|---|---|
| Channel Number | Byte | 0 | 15 | Channel to use for RTS |

Remark:

- if RTS receiver has an IP stored => IP is deleted
- if RTS receiver position is different from stored IP or if there is no IP stored => new position is stored as IP

## *5.3 Control Functions*

### 5.3.1 CTRL_POSITION (80h)

- Send RTS Up/Down/Stop/IP orders to the selected motor output.
- Send RTS On/Off orders to the selected non motor output.

| MSG | Name | DATA Length | FRAME Length | Addressing | | |
|---|---|---|---|---|---|---|
| 80h | CTRL_POSITION | 2 | 13 | P2P | GROUP | BROADCAST |

| DATA | TYPE | MIN | MAX | Description |
|---|---|---|---|---|
| Channel Number | Byte | 0 | 15 | Channel to use for RTS |
| Function | Byte | 1 | 4 | |

| Function | Description | Remarks |
|---|---|---|
| 01h | Move to UP Limit / LIGHT ON | See Remark below |
| 02h | Move to DOWN Limit / LIGHT OFF | See Remark below |
| 03h | STOP | No effect for non motor receivers |
| 04h | Move to Intermediate Position / LIGHT ON with favorite light position | |

Remark: Number of RTS frames effectively sent depends on CE/US/ROLLING mode of the corresponding channel (see SET_CHANNEL_MODE)

### 5.3.2 CTRL_TILT (81h)

➢ Send RTS Tilt+/Tilt- orders to the selected motor output.

| MSG | Name | DATA Length | FRAME Length | Addressing | | |
|---|---|---|---|---|---|---|
| 81h | CTRL_TILT | 3 | 14 | P2P | GROUP | BROADCAST |

| DATA | TYPE | MIN | MAX | Description |
|---|---|---|---|---|
| Channel Number | Byte | 0 | 15 | Channel to use for RTS |
| Function | Byte | 0 | 1 | |
| Tilting Amplitude | Byte | 1 | 127 | Only significant when the channel is configured as running in « Modulis Mode ». Ignored otherwise |

| Function | Description | Remarks |
|---|---|---|
| 00h | TILT+ | |
| 01h | TILT- | |

Remark:

- If the specified channel is in “Modulis” mode, amplitude of tilting depend on the “Tilting Amplitude” parameter.
- If the specified channel is not in “Modulis” mode but is in “Tilting” mode (see SET_CHANNEL_MODE), amplitude of tilting depend on “Number of frames to send” parameter set according to the current mode (see SET_TILT_FRAMECOUNT).
- If the specified channel is neither in “Modulis” mode nor “Tilting” mode (see SET_CHANNEL_MODE), Command is rejected. (NACK with “CANNOT_TILT_IN_ROLLING_MODE” status)

### 5.3.3 CTRL_DIM (82h)

➢ Send RTS Dim+/Dim- orders to the selected receiver.

| MSG | Name | DATA Length | FRAME Length | Addressing | | |
|---|---|---|---|---|---|---|
| 82h | CTRL_DIM | 3 | 14 | P2P | GROUP | BROADCAST |

| DATA | TYPE | MIN | MAX | Description |
|---|---|---|---|---|
| Channel Number | Byte | 0 | 15 | Channel to use for RTS |
| Function | Byte | 0 | 1 | |
| DIM Amplitude | Byte | 1 | 127 | Only significant when the channel is configured as running in « Modulis Mode ». Ignored otherwise |

| Function | Description | Remarks |
|---|---|---|
| 00h | DIM+ | |
| 01h | DIM- | |

Remark: If the channel is not a “Modulis” one (see SET_CHANNEL_MODE), amplitude of tilting depend on “Number of frames to send” parameter set (see SET_DIM_FRAMECOUNT).
If the channel is a “Modulis” one, amplitude of tilting depend on the “DIM Amplitude” parameter.

## *5.4 Status Functions*

### 5.4.1 GET_CHANNEL_MODE (A0h)

➢ Get the modes used for the selected channel. This mode is used to determine the number of RTS frame to send on **CTRL_POSITION** and **CTRL_TILT** Orders.

| MSG | Name | DATA Length | FRAME Length | Addressing | | |
|---|---|---|---|---|---|---|
| A0h | GET_CHANNEL_MODE | 1 | 12 | P2P | GROUP | BROADCAST |

| DATA | TYPE | MIN | MAX | Description |
|---|---|---|---|---|
| Channel Number | Byte | 0 | 15 | Channel to get modes from |

### 5.4.2 GET_TILT_FRAMECOUNT (A1h)

➢ Get the number of RTS frames the product should send on a **CTRL_TILT** order.

| MSG | Name | DATA Length | FRAME Length | Addressing | | |
|---|---|---|---|---|---|---|
| A1h | GET_TILT_FRAMECOUNT | 1 | 12 | P2P | GROUP | BROADCAST |

| DATA | TYPE | MIN | MAX | Description |
|---|---|---|---|---|
| Channel Number | Byte | 0 | 15 | Channel to set |

### 5.4.3 GET_DIM_FRAMECOUNT (A2h)

➢ Get the number of RTS frames the product should send on a **CTRL_DIM** order.

| MSG | Name | DATA Length | FRAME Length | Addressing | | |
|---|---|---|---|---|---|---|
| A2h | GET_DIM_FRAMECOUNT | 1 | 12 | P2P | GROUP | BROADCAST |

| DATA | TYPE | MIN | MAX | Description |
|---|---|---|---|---|
| Channel Number | Byte | 0 | 15 | Channel to set |

### 5.4.4 GET_DCT_LOCK (A4h)

➢ To know which DCT are locked or unlocked.

| MSG | Name | DATA Length | FRAME Length | Addressing | | |
|---|---|---|---|---|---|---|
| A4h | GET_DCT_LOCK | 0 | 11 | P2P | GROUP | BROADCAST |

### 5.4.5 POST_CHANNEL_MODE (B0h)

➢ Post the modes used for the selected channel. This mode is used to determine the number of RTS frame to send on **CTRL_POSITION** and **CTRL_TILT** Orders.

| MSG | Name | DATA Length | FRAME Length | Addressing | | |
|---|---|---|---|---|---|---|
| B0h | POST_CHANNEL_MODE | 4 | 15 | P2P | GROUP | BROADCAST |

| DATA | TYPE | MIN | MAX | Description |
|---|---|---|---|---|
| Channel Number | Byte | 0 | 15 | Channel |
| US/CE mode | Byte | 0 | 1 | Used for UP/DOWN/TILT |
| Rolling/Tilting Mode | Byte | 0 | 1 | Used for UP/DOWN |
| Modulis Mode | Byte | 0 | 1 | Used for motors/receivers compatible with Modulis = tilting or dimming |

| US/CE mode | Description | Remarks |
|---|---|---|
| 00h | CE mode | |
| 01h | US Mode | Default |

| Rolling/Tilting Mode | Description | Remarks |
|---|---|---|
| 00h | Rolling mode | Default |
| 01h | Tilting Mode | |

| Modulis Mode | Description | Remarks |
|---|---|---|
| 00h | Normal mode | |
| 01h | Modulis Mode | Default |

### 5.4.6 POST_TILT_FRAMECOUNT (B1h)

➢ Post the number of RTS frames the product should send on a **CTRL_TILT** order.

| MSG | Name | DATA Length | FRAME Length | Addressing | | |
|---|---|---|---|---|---|---|
| B1h | POST_TILT_FRAMECOUNT | 3 | 14 | P2P | GROUP | BROADCAST |

| DATA | TYPE | MIN | MAX | Description |
|---|---|---|---|---|
| Channel Number | Byte | 0 | 15 | Channel to set |
| Number of frames to send for US mode | Byte | 4 | 255 | Default Value: 5 |
| Number of frames to send for CE mode | Byte | 2 | 13 | Default Value: 2 |

### 5.4.7 POST_DIM_FRAMECOUNT (B2h)

➢ Post the number of RTS frames the product should send on a **CTRL_DIM** order.

| MSG | Name | DATA Length | FRAME Length | Addressing | | |
|---|---|---|---|---|---|---|
| B2h | POST_DIM_FRAMECOUNT | 2 | 13 | P2P | GROUP | BROADCAST |

| DATA | TYPE | MIN | MAX | Description |
|---|---|---|---|---|
| Channel Number | Byte | 0 | 15 | Channel to set |
| Number of frames to send | Byte | 4 | 255* | Default Value: 5 |

### 5.4.8 POST_DCT_LOCK (B4h)

➢ Signal which DCT should not be routed through RTS layer.

| MSG | Name | DATA Length | FRAME Length | Addressing | | |
|---|---|---|---|---|---|---|
| B4h | POST_DCT_LOCK | 1 | 12 | P2P | GROUP | BROADCAST |

| DATA | TYPE | MIN | MAX | Description |
|---|---|---|---|---|
| DCT LOCK | Byte | 0x00 | 0xFF | Bit field |

| DCT LOCK | Description | Remarks |
|---|---|---|
| b0 | Reserved | Ignored |
| b1 | DCT1 Lock status | 0:Unlocked / 1: Locked |
| b2 | DCT2 Lock status | 0:Unlocked / 1: Locked |
| b3 | DCT3 Lock status | 0:Unlocked / 1: Locked |
| b4 | DCT4 Lock status | 0:Unlocked / 1: Locked |
| b5 | DCT5 Lock status | 0:Unlocked / 1: Locked |
| b6 | Reserved | Ignored |
| b7 | Reserved | Ignored |