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ST8500 Hybrid PLC&RF connectivity development kit – G3 GUI quick start guide

Rev. 2

Jun 2021

Introduction

- Scope of this presentation is to help you on starting the evaluation of G3-PLC Hybrid communication using EVLKST8500GH868 or EVLKST8500GH915 with the G3 GUI
- Steps to be performed:
 1. Upgrade to the latest FW from the STSW-ST8500GH package available at https://www.st.com/content/st_com/en/products/embedded-software/evaluation-tool-software/stsw-st8500gh.html
 2. Open the GUI and configure the development kit
 3. Perform communication tests
 1. PHY layer
 2. IPv6 layer

NUCLEO-G070RB FW upgrade

- After installing the STM32 CubeProgrammer (available on https://www.st.com/content/st_com/en/products/development-tools/software-development-tools/stm32-software-development-tools/stm32-programmers/stm32cubeprog.html), connect the USB cable to the NUCLEO-G070RB USB connector and launch the appropriate batch (.bat) file, based on the network role and kit type (EVLKST8500GH868 or EVLKST8500GH915).
- Please note that for each G3-PLC network only one node must be programmed as Coordinator.
- Please connect one EVLKST8500GH at a time.

NUCLEO-G070RB FW upgrade (868 MHz)

```

C:\WINDOWS\system32\cmd.exe
-----
STM32CubeProgrammer v2.7.0
-----

ST-LINK SN   : 066CFF323532534157123511
ST-LINK FW   : V2J31M21
Board        : NUCLEO-G070RB
Voltage      : 3.24V
SWD freq     : 4000 KHz
Connect mode : Normal
Reset mode   : Software reset
Device ID    : 0x460
Revision ID  : Rev B
Device name  : STM32G07x/STM32G08x
Flash size   : 128 KBytes
Device type  : MCU
Device CPU   : Cortex-M0+

Coordinator

Memory Programming ...
Opening and parsing file: NUCLEO-G070RB_coord_868.hex
  File       : NUCLEO-G070RB_coord_868.hex
  Size       : 41286 Bytes
  Address    : 0x08000000

Erasing memory corresponding to segment 0:
Erasing internal memory sectors [0 20]
Download in Progress:
100%

File download complete
Time elapsed during download operation: 00:00:01.165
Press ENTER to continue

```

```
C:\WINDOWS\system32\cmd.exe
```

```
-----  
STM32CubeProgrammer v2.7.0  
-----  
  
ST-LINK SN   : 066CFF323532534157123511  
ST-LINK FW   : V2J31M21  
Board        : NUCLEO-G070RB  
Voltage      : 3.25V  
SWD freq     : 4000 KHz  
Connect mode : Normal  
Reset mode   : Software reset  
Device ID    : 0x460  
Revision ID  : Rev B  
Device name   : STM32G07x/STM32G08x  
Flash size   : 128 KBytes  
Device type   : MCU  
Device CPU    : Cortex-M0+  
  
Memory Programming ...  
Opening and parsing file: NUCLEO-G070RB_device_868.hex  
File           : NUCLEO-G070RB_device_868.hex  
Size            : 41276 Bytes  
Address         : 0x08000000  
  
Erasing memory corresponding to segment 0:  
Erasing internal memory sectors [0 20]  
Download in Progress:  
[Progress Bar] 100%  
  
File download complete  
Time elapsed during download operation: 00:00:01.149  
Press ENTER to continue.
```

NUCLEO-G070RB FW upgrade (915 MHz)

```
Select C:\WINDOWS\system32\cmd.exe

-----
STM32CubeProgrammer v2.7.0
-----

ST-LINK SN : 066CFF323532534157123511
ST-LINK FW : V2J31M21
Board      : NUCLEO-G070RB
Voltage    : 3.25V
SWD freq   : 4000 KHz
Connect mode: Normal
Reset mode : Software reset
Device ID  : 0x460
Revision ID: Rev B
Device name: STM32G07x/STM32G08x
Flash size : 128 KBytes
Device type: MCU
Device CPU  : Cortex-M0+

Coordinator

Memory Programming ...
Opening and parsing file: NUCLEO-G070RB_coord_915.hex
  File      : NUCLEO-G070RB_coord_915.hex
  Size      : 41286 Bytes
  Address   : 0x08000000

Erasing memory corresponding to segment 0:
Erasing internal memory sectors [0 20]
Download in Progress:
100%

File download complete
Time elapsed during download operation: 00:00:01.147
Press ENTER to continue
```

```
Select C:\WINDOWS\system32\cmd.exe

-----
STM32CubeProgrammer v2.7.0
-----

ST-LINK SN : 066CFF323532534157123511
ST-LINK FW : V2J31M21
Board      : NUCLEO-G070RB
Voltage    : 3.25V
SWD freq   : 4000 KHz
Connect mode: Normal
Reset mode : Software reset
Device ID  : 0x460
Revision ID: Rev B
Device name: STM32G07x/STM32G08x
Flash size : 128 KBytes
Device type: MCU
Device CPU  : Cortex-M0+

Device

Memory Programming ...
Opening and parsing file: NUCLEO-G070RB_device_915.hex
  File      : NUCLEO-G070RB_device_915.hex
  Size      : 41276 Bytes
  Address   : 0x08000000

Erasing memory corresponding to segment 0:
Erasing internal memory sectors [0 20]
Download in Progress:
100%

File download complete
Time elapsed during download operation: 00:00:01.150
Press ENTER to continue
```

ST8500 FW upgrade steps

- Launch *ST8500_G3_Hybrid_PE_RTE_upload.bat* file and follow the instructions

```
C:\windows\system32\cmd.exe

#####
FW UPGRADE PROCEDURE FOR ST EVALUATION BOARDS
Before proceeding with FW upload, please ensure that STM32 MODE
switch position is "1" (DOWN) and PLC BOOT1 is "1" (DOWN)

FOR OTHER HARDWARE PLATFORMS, PLEASE ENSURE TO SET ST8500 BOOT1 HIGH (e.g. PULL-UP)
#####

#####
Press RESET or Power OFF/Power ON
#####

#####
Press RETURN
#####

Enter COM port number (e.g. 9) and press RETURN: 17

Selected COM port is : COM17
Current running protocol is:
Check running protocol
ACK
Protocol running is BOOT

#####
Press RESET or Power OFF/Power ON
#####

#####
Press RETURN
#####
Press any key to continue . . .
```

Running protocol is BOOT
if ST8500 SPI flash is
empty

ST8500 FW upgrade steps

- *ST8500_SPI_Loader.img* file upload on ST8500 RAM
- After completion, FW images are written into ST8500 SPI flash

```
Upload on ST8500 RAM a boot software on-going...
ACK
True
ACK
BOOT Version read:True
Loading IMG Header
ACK
Header OK... start sending file
ACK
Done Write 2.8%
ACK
Done Write 5.4%
ACK
Done Write 8.0%
ACK
Done Write 10.6%
ACK
Done Write 13.2%
ACK
Done Write 15.7%
ACK
Done Write 18.3%
ACK
Done Write 20.9%
```



```
Done Write 82.9%
ACK
Done Write 85.5%
ACK
Done Write 88.1%
ACK
Done Write 90.6%
ACK
Done Write 93.2%
ACK
Done Write 95.8%
ACK
Done Write 98.4%
ACK
Done Write 100.0%
PE IMG File Loaded: imgs\ST8500_SPI_Loader.img
Send IMG Start Request
ACK
START DONE
Press any key to continue . . .
```

ST8500 FW upgrade steps

- Write of FW images into ST8500 SPI flash (final part and program termination)
- After RESET, the ST8500 is ready for test with G3 GUI

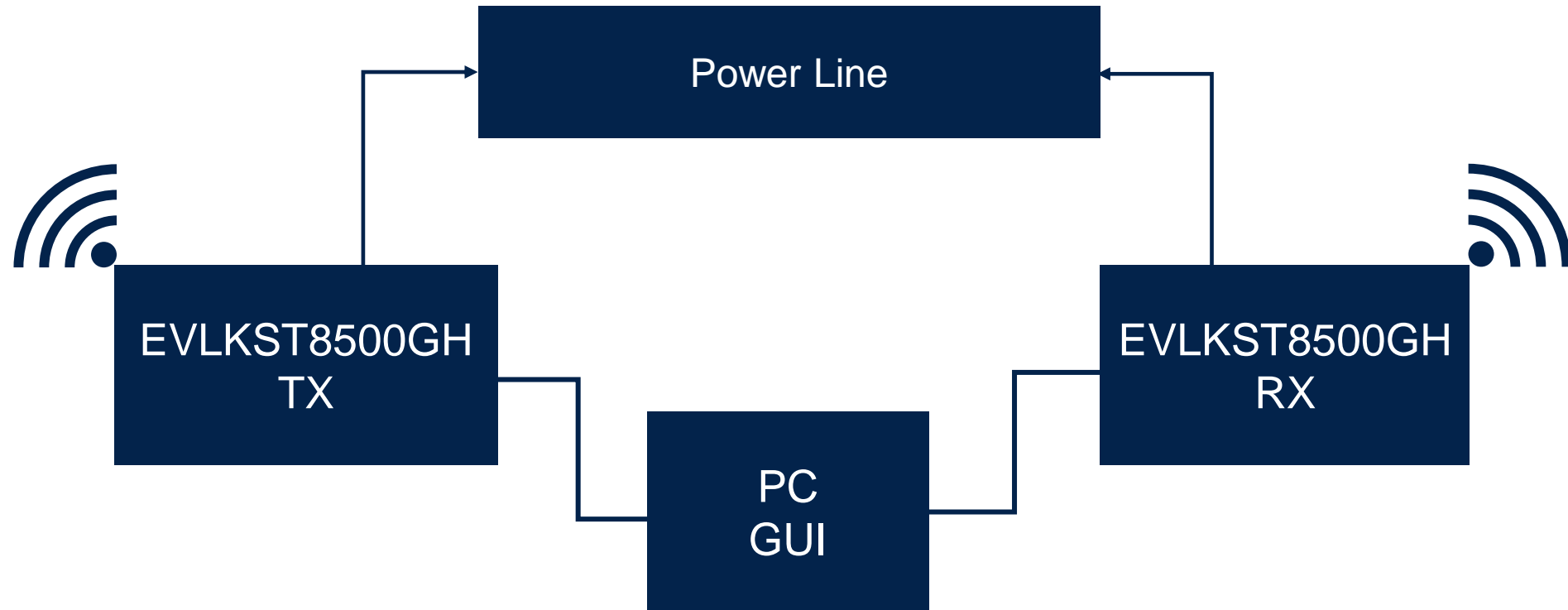
```
C:\windows\system32\cmd.exe
, 239, 15, 199, 108, 136, 44, 58, 99, 134, 22, 32, 196, 147, 66, 76, 7, 49, 170, 55, 100, 115, 96, 188, 211, 232, 83, 68
, 213, 181, 169, 46, 165, 186, 157, 146, 97, 130, 54, 213, 234, 213, 96, 228, 222, 2, 1, 208, 93, 189, 51, 64, 167, 107,
147, 119, 182, 241, 135, 48, 84, 93, 82, 53, 230, 107, 0, 63, 190, 90, 27, 204, 64, 167, 83, 152, 82, 173, 49, 144, 199
, 110, 128, 210, 43, 117, 76, 62, 100, 141, 177, 158, 81, 21, 85, 55, 51, 202, 76, 7, 31, 126, 154, 2, 177, 122, 180, 91
, 72, 147, 184, 139, 77, 86, 57, 13, 21, 215, 195, 24, 215, 57, 10, 115, 127, 244, 53, 60]')
Received: SFLASH_confirm_ID
SFLASH Confirm
SFLASH Request
Send data: ('[2, 134, <MM_cmd_id.SFLASH_request_ID: 78>, <SFLASH_operation.WRITE: 2>, 128, 0, 128, 222, 1, 0, 225, 161,
106, 183, 217, 177, 239, 246, 108, 60, 211, 221, 15, 190, 67, 160, 39, 55, 237, 231, 51, 66, 108, 214, 205, 31, 102, 49,
84, 223, 173, 178, 2, 205, 46, 0, 100, 84, 167, 246, 238, 102, 2, 86, 230, 158, 29, 163, 224, 231, 18, 243, 147, 104, 1
36, 84, 179, 17, 118, 240, 178, 182, 38, 181, 11, 57, 46, 101, 24, 176, 119, 95, 254, 72, 144, 2, 152, 65, 161, 228, 58,
32, 82, 76, 155, 64, 228, 105, 249, 53, 144, 183, 19, 35, 145, 212, 92, 228, 6, 17, 12, 207, 125, 191, 62, 152, 125, 11
2, 135, 97, 200, 21, 122, 9, 237, 35, 135, 175, 38, 12, 28, 44, 218, 45, 43, 16, 182, 165, 208, 63]')
Received: SFLASH_confirm_ID
SFLASH Confirm
SFLASH Request
Send data: ('[2, 54, <MM_cmd_id.SFLASH_request_ID: 78>, <SFLASH_operation.WRITE: 2>, 48, 0, 0, 223, 1, 0, 224, 176, 252,
252, 166, 109, 15, 37, 214, 193, 35, 176, 66, 141, 116, 199, 161, 173, 99, 236, 166, 51, 42, 23, 213, 26, 148, 236, 124
, 129, 224, 247, 189, 79, 62, 107, 57, 213, 151, 75, 159, 120, 245, 82, 107, 180, 155, 252, 140, 28]')
Received: SFLASH_confirm_ID
SFLASH Confirm
FW Upload status : 3
OK: FW upload completed

Press any key to continue . . .
#####
Press RESET or Power OFF/Power ON
#####

#####
Press RETURN
#####
```


Communication Test setup

- Basic setup with two nodes

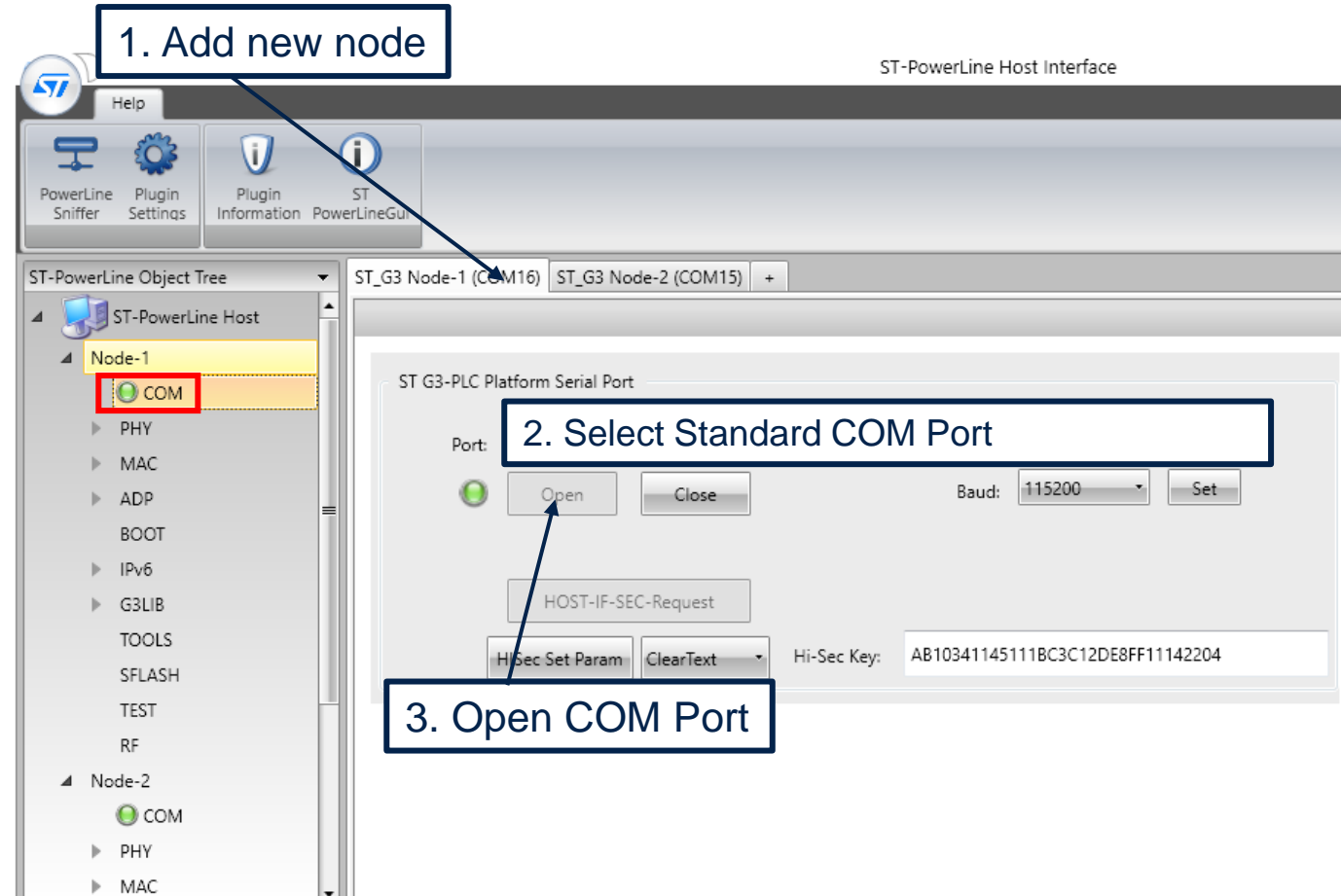


PHY communication tests

Communication setup steps

1. Open G3 GUI: unzip archive and launch *StPowerLineGui.exe* file
2. Add two new nodes and open the UART connection (Standard COM port)
3. Initialize and configure TX and RX nodes
4. Basic TX and RX test
5. Automated data rate TX and RX test with statistics

G3 GUI – UART connection



Note: you need to create at least 2 nodes for communication test

G3 GUI – G3-PLC node initialization

- Repeat the same step for each node

The screenshot displays the ST-PowerLine Host Interface. On the left, the 'ST-PowerLine Object Tree' shows a hierarchy where 'G3LIB' is highlighted under 'Node-1'. The main panel shows various request buttons. A blue arrow points from the 'G3LIB' entry in the tree to the 'G3LIB-SWRESET.Request' button. Below this button, a text box lists available options: CENELEC_A, CENELEC_B, and FCC. The 'ST-PowerLine Trace Window' at the bottom shows a log of messages, including 'G3LIB-SWRESET.Confirm' and 'G3LIB-SWRESET.Request'.

ST-PowerLine Host Interface

ST-PowerLine Object Tree

- ST-PowerLine Host
 - Node-1
 - COM
 - PHY
 - MAC
 - ADP
 - BOOT
 - IPv6
 - G3LIB**
 - TOOLS
 - SFLASH
 - TEST
 - RF
 - Node-2
 - COM
 - PHY
 - MAC

ST-G3 Node-1 (COM16) ST-G3 Node-2 (COM15) +

HI-DBG-TOOL.Request Operation: HI_DBG_INFO HI-HWRESET.Request

HI-TRC-CONFIG.Request Operation: HI_SET_FILTER UInt8 [Hex]

Modules: G3LIB_PHY_DATA G3LIB_PHY_DEBUG G3LIB_PHY_INFO G3LIB_RTET_DEBUG G3LIB_RTET_INFO G3LIB_MAC_DATA G3LIB_MAC_DEBUG

Priority: x 0 Save To Sflash: ☐

HI-RESETSTATE.Request HI-MODE-GET.Request

G3LIB-SWRESET.Request CENELEC_A DEVICE PHY_MODE

G3LIB-TESTMODE.Request

Available options:
CENELEC_A
CENELEC_B
FCC

ST-PowerLine Trace Window

	Time	Device	Message	Error	Info
	12:50:53.206	COM16	<-- G3LIB-SWRESET.Confirm	SUCCESS	Status: G3_SUCCESS
	12:50:53.126	COM16	--> G3LIB-SWRESET.Request		ProtocolVersion: CENELEC A, DeviceType: DEVICE, Mode: PHY_MODE
	12:46:44.988	COM15	Open OK		
	12:46:42.748	COM16	Open OK		
	12:46:29.273	COM15	Close OK		
	12:45:38.354	COM15	Open OK		

G3 GUI – RF configuration for EVLKST8500GH868

- Repeat the same step for each node

Carrier frequency: 863 100 000 Hz in HEX format

Key parameters

Parameter	Value
BaseFreq: 0x	3371DC60
DataRate: 0x	0000C350
Bandwidth: 0x	000186A0
XtalFreq: 0x	02FAF080
PowerBm: 0x	23
PktEnFEC: 0x	00
PktEnInterleaving: 0x	01
MCUClkEnable: 0x	00
MCUClkXORatio: 0x	FF
MCUClkClockCycles: 0x	FF
FEMEnabled: 0x	00
FEMGpioPinCPS: 0x	FF
FEMTxBypassEn: 0x	00
Modulation: 0x	00
FreqDev: 0x	000030D4
CsBlanking: 0x	01
RSSIGain: 0x	0E
PktCRCMode: 0x	A0
PktEnWhiten: 0x	01
IrqGpioPin: 0x	00
MCUClkGpioPin: 0x	FF
MCUClkRCORatio: 0x	FF
ExtSmpsEnable: 0x	00
FEMGpioPinCSD: 0x	FF
FEMGpioPinCTX: 0x	FF

G3 GUI – RF configuration for EVLKST8500GH915

- Repeat the same step for each node

Carrier frequency: 915 000 000 Hz in HEX format

Key parameters

Parameter	Unit	Value (Hex)
BaseFreq	0x UInt32 [Hex]	3689CAC0
DataRate	0x UInt32 [Hex]	0000C350
Bandwidth	0x UInt32 [Hex]	000186A0
XtalFreq	0x UInt32 [Hex]	02FAF080
PowerBm	0x UInt8 [Hex]	2D
PktEnFEC	0x UInt8 [Hex]	00
PktEnInterleaving	0x UInt8 [Hex]	01
MCUClkEnable	0x UInt8 [Hex]	00
MCUClkXORatio	0x UInt8 [Hex]	FF
MCUClkClockCycles	0x UInt8 [Hex]	FF
FEMEnabled	0x UInt8 [Hex]	01
FEMGpioPinCPS	0x UInt8 [Hex]	01
FEMTxBypassEn	0x UInt8 [Hex]	00
Modulation	0x UInt8 [Hex]	00
FreqDev	0x UInt32 [Hex]	000030D4
CsBlanking	0x UInt8 [Hex]	01
RSSIGain	0x UInt8 [Hex]	0E
PktCRCMode	0x UInt8 [Hex]	A0
PktEnWhiten	0x UInt8 [Hex]	01
IrqGpioPin	0x UInt8 [Hex]	03
MCUClkGpioPin	0x UInt8 [Hex]	FF
MCUClkRCORatio	0x UInt8 [Hex]	FF
ExtSmpsEnable	0x UInt8 [Hex]	00
FEMGpioPinCSD	0x UInt8 [Hex]	00
FEMGpioPinCTX	0x UInt8 [Hex]	02

G3 GUI – PHY TX settings and basic test

ST-PowerLine Host Interface

3. TX node: press one of the two DATA.Request buttons to perform PLC or RF transmission

1. TX node: select TX state

2. Edit packet size, then click on Generate Random

Modulation type

Modulation scheme

TX Power (HEX)

RF DATA.Indication from RX node

PLC DATA.Indication from RX node

Time	Device	Message	Error	Info
13:04:12.801	COM15	<-- G3PHY-RF.Indication	SUCCESS	PayloadLen: 128 - Payload: 25E5EF8DA525F06AF2254DB0DB82101BE58ED6AB68013AF3628BF2B79614F2819880B57E8A47C800A05B2A4121
13:04:12.791	COM16	<-- G3PHY-RF.Confirm	SUCCESS	Data sent with status: G3_SUCCESS
13:04:12.749	COM16	--> G3PHY-RF.Request		Payload [Hex]: 25 E5 EF 8D A5 25 F0 6A F2 25 4D B0 DB 82 10 1B E5 8E D6 AB 68 01 3A F3 62 8B F2 B7 96 14 F2 81 98 80 B5 7E 8A 47 C8 00 ,
13:04:07.618	COM15	<-- G3PHY-DATA.Indication	SUCCESS	ModType: ROBO - ModScheme: Differential - Lqi: 0xE6 - PayloadLen: 128 - Payload: 25E5EF8DA525F06AF2254DB0DB82101BE58ED6AB68013
13:04:07.603	COM16	<-- G3PHY-DATA.Confirm	SUCCESS	Data sent with status: G3_SUCCESS
13:04:07.397	COM16	--> G3PHY-DATA.Request		TxPower: 0x20 - ModType: ROBO - ModScheme: Differential - ToneMap [Hex]: 00 00 3F - Payload [Hex]: 25 E5 EF 8D A5 25 F0 6A F2 25 4D B0 DB 82 10 1B E5 8E D6 AB 68 01 3A F3 62 8B F2 B7 96 14 F2 81 98 80 B5 7E 8A 47 C8 00 ,
13:03:57.128	COM16	<-- G3PHY-SETTRXSTATE.Confirm	SUCCESS	Result: G3_SUCCESS
13:03:57.124	COM16	--> G3PHY-SETTRXSTATE.Request		TRX_STATE: TXON_RXOFF

G3 GUI – PHY DATA.Indication from RX node

- PLC PHY DATA.Indication details

[illegible]

- RF PHY DATA.Indication details

13:04:12.801

COM15

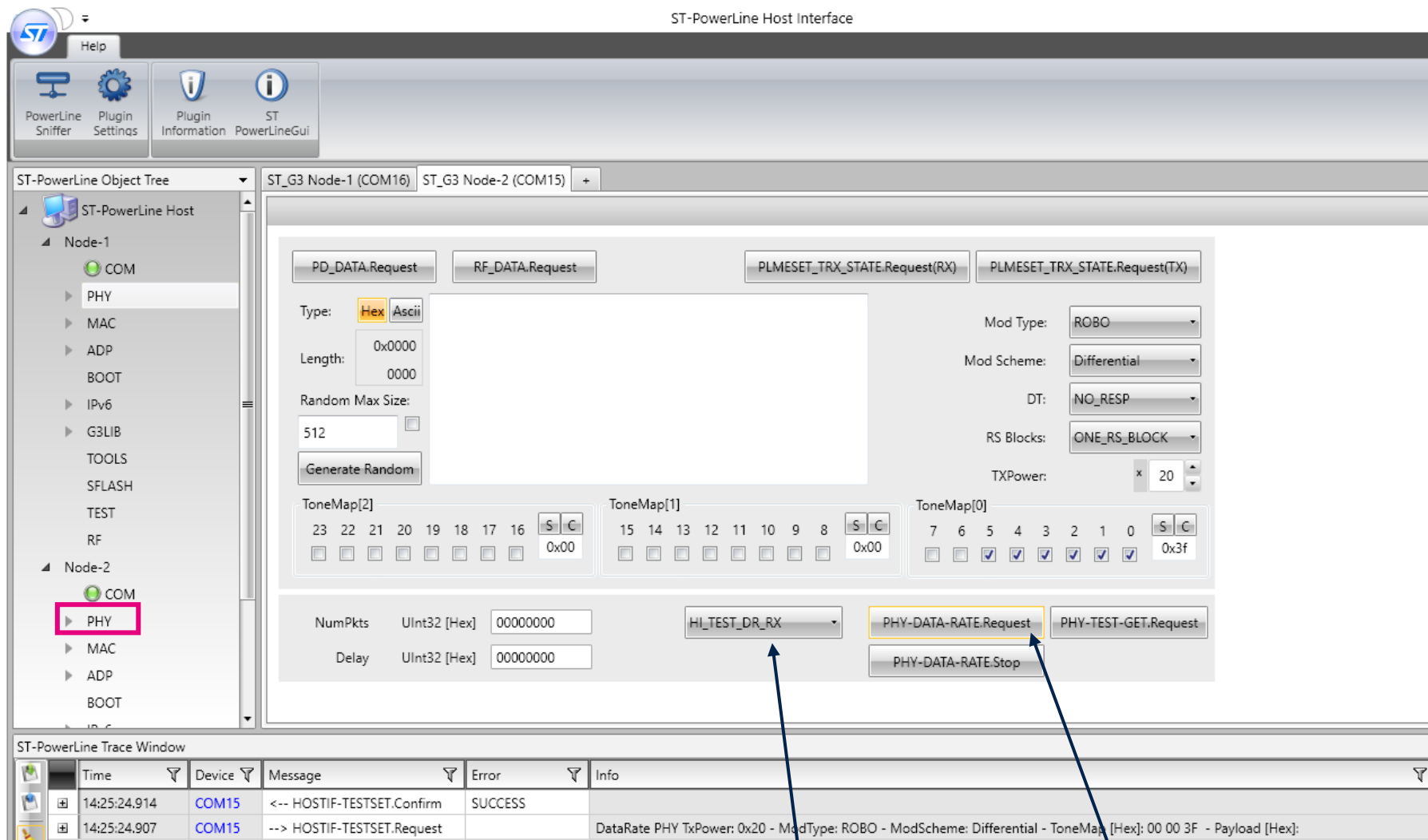
<-- G3PHY-RF.Indication

SUCCESS

PayloadLen: 128 - Payload: 25E5EFBDA525F06AF2254D80DB82101BE58ED6AB68013AF3628BF2B79614F2819880B57E8A47C800A05B2A4121

Field Name	Info
RSSI:	0x75
Noise:	0x1C
PayloadLen:	128
Payload [Hex]:	25 E5 EF BD A5 25 F0 6A F2 25 4D 80 DB 82 10 1B E5 8E D6 AB 68 01 3A F3 62 8B F2 B7 96 14 F2 81 98 80 B5 7E 8A 47 C8 00 A0 5B 2A 41 21 E3 C1 CE A3 4B 46 30 9C 0A 6C 24 AE
HexDump	16 16 48 85 00 00 00 00 00 00 00 75 1C 80 00 25 E5 EF BD A5 25 F0 6A F2 25 4D 80 DB 82 10 1B E5 8E D6 AB 68 01 3A F3 62 8B F2 B7 96 14 F2 81 98 80 B5 7E 8A 47 C8 00 A0 5B :

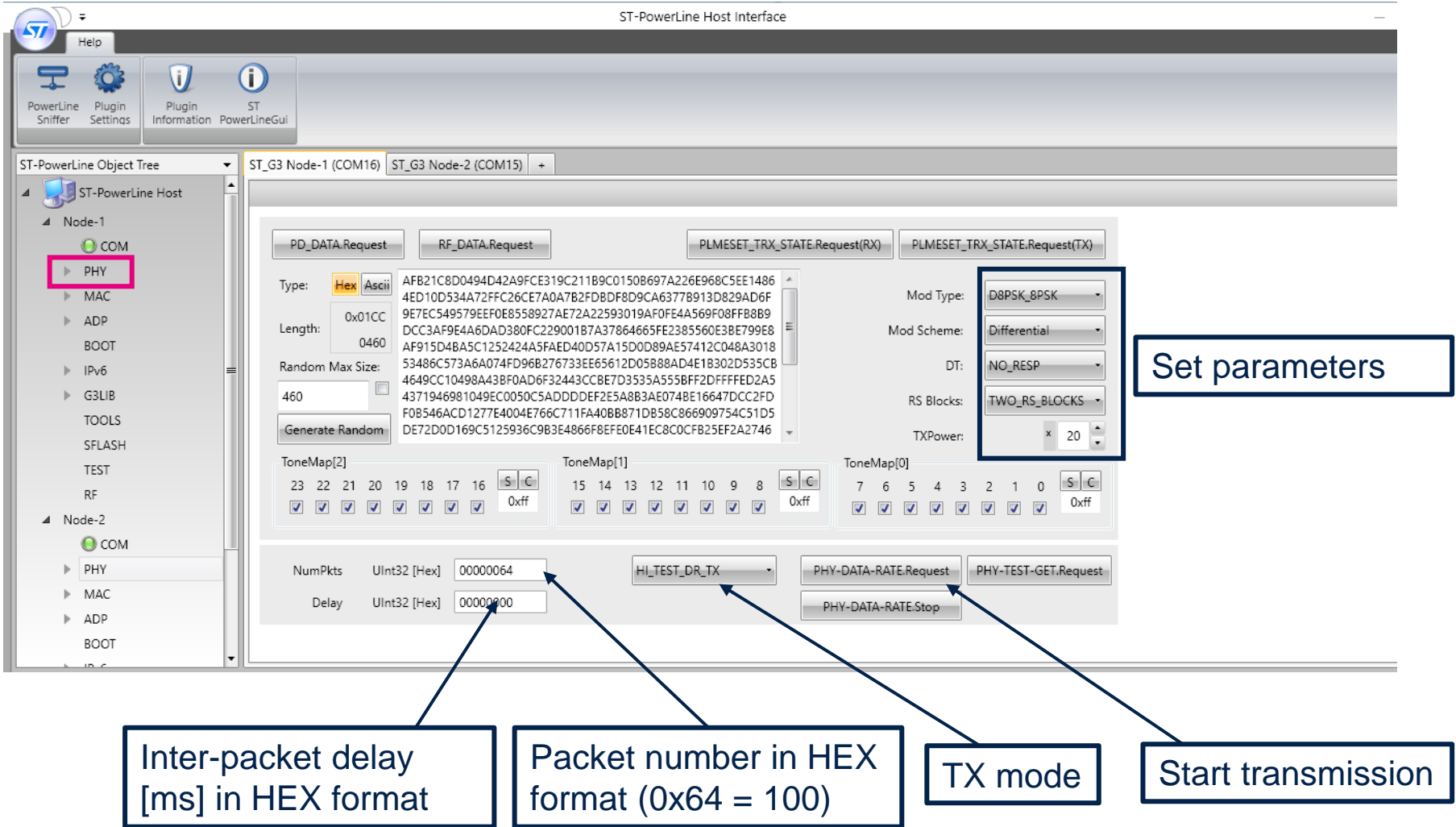
G3 GUI – automated data rate RX start



RX test mode

Start RX test: waiting for TX start

G3 GUI – automated data rate TX test



- Once the transmission has finished, you can see the statistics related to TX and RX packets



IPv6 communication tests

Communication setup steps

1. Open G3 GUI: unzip archive and launch *StPowerLineGui.exe* file
2. Add two new nodes and open the UART connection (Standard COM port)
3. Initialize and configure TX and RX nodes
4. Set one node as COORD and the other as DEVICE in IPv6_BOOT_MODE.
(Note that it's preferable to configure the Coordinator first for faster Join procedure)
5. Get MAC short address for both COORD and DEVICE
6. Configure UDP unicast connection for both COORD and DEVICE
7. Test communication from COORD to DEVICE
8. Test communication from DEVICE to COORD

IPv6 boot mode configuration: Coordinator

13:05:13.431	COM11	<-- G3BOOT-SRV-START.Confirm	SUCCESS	Status: G3_SUCCESS
13:04:53.374	COM11	<-- G3LIB-SWRESET.Confirm	SUCCESS	Status: G3_SUCCESS
13:04:51.958	COM11	--> G3LIB-SWRESET.Request		ProtocolVersion: CENELEC A, DeviceType: COORD
13:04:40.381	COM11	<-- HOSTIF-MODESET.Confirm	SUCCESS	
13:04:40.349	COM11	--> HOSTIF-MODESET.Request		IPV6_BOOT_MODE

IPv6 boot mode configuration: Device

13:07:44.847	COM9	<-- G3BOOT-DEV-START.Confirm	SUCCESS	Status: G3_SUCCESS - NetworkAddress: 0x0002 - PANId: 0x781D
13:07:44.743	COM11	<-- G3BOOT-SRV-JOIN.Indicatio	SUCCESS	ExtendedAddress: 0x0080E1FFFE4BA618 - ShortAddress: 0x0002
13:07:43.391	COM11	<-- G3BOOT-SRV-GETPSK.Indica	SUCCESS	ExtendedAddress: 0x0080E1FFFE4BA618 - IdP: 0x0080E1FFFE4BA618
13:07:39.977	COM9	<-- G3BOOT-DEV-PANSORT.Indi	SUCCESS	PANCount: 1
13:07:19.919	COM9	<-- G3LIB-SWRESET.Confirm	SUCCESS	Status: G3_SUCCESS
13:07:19.891	COM9	--> G3LIB-SWRESET.Request		ProtocolVersion: CENELEC A, DeviceType: DEVICE
13:07:14.690	COM9	<-- HOSTIF-MODESET.Confirm	SUCCESS	
13:07:14.676	COM9	--> HOSTIF-MODESET.Request		IPV6_BOOT_MODE

MAC short address: Coordinator

Coordinator node

ST-PowerLine Object Tree

- MAC
- ADP
- BOOT
- IPv6
- G3LIB
 - G3LIB_IB**
 - G3LIB_IB_EX
- TOOLS

ST_G3 Node-1 (COM11) ST_G3 Node-2 (COM9) +

G3LIB-GET.Request macShortAddress Index: 0x 0000 ☐ MultipleEntries G3LIB-GETAll.Request

G3LIB-SET.Request adpActiveKeyIndex Value: 0x 0000 G3LIB Start Logging

UInt8 [Hex] G3LIB Load Config

Select macShortAddress, then click on G3LIB-GET.Request

ST-PowerLine Trace Window

	Time	Device	Message	Error	Info
	14:10:42.123	COM11	<-- G3LIB-GET.Confirm	SUCCESS	Status: G3_SUCCESS - AttributeName: macShortAddress - Index: 0x0000 - Value: 0x0000
	14:10:42.115	COM11	--> G3LIB-GET.Request		ID: 0x00000053 macShortAddress - Index: 0x0000

Coordinator MAC short address

MAC short address: Device

PowerLine Sniffer Plugin Settings Plugin Information ST PowerLineGui

Device node

ST-PowerLine Object Tree

- PHY
- MAC
- ADP
- BOOT
- IPv6
- G3LIB
 - G3LIB_IB**
 - G3LIB_IB_EX

TOOLS

ST_G3 Node-1 (COM11) ST_G3 Node-2 (COM9) +

G3LIB-GET.Request macShortAddress Index: 0x 0000 ☐ MultipleEntries G3LIB-GETAll.Request

G3LIB-SET.Request adpActiveKeyIndex Value: 0x 0002 G3LIB Start Logging

UInt8 [Hex] G3LIB Load Config

Select macShortAddress, then click on G3LIB-GET.Request

ST-PowerLine Trace Window

	Time	Device	Message	Error	Info
+	14:12:29.065	COM9	<-- G3LIB-GET.Confirm	SUCCESS	Status: G3_SUCCESS - AttributeName: macShortAddress - Index: 0x0000 - Value: 0x0002
+	14:12:29.060	COM9	--> G3LIB-GET.Request		ID: 0x00000053 macShortAddress - Index: 0x0000
+	14:10:42.123	COM11	<-- G3LIB-GET.Confirm	SUCCESS	Status: G3_SUCCESS - AttributeName: macShortAddress - Index: 0x0000 - Value: 0x0000

Device MAC short address

Unicast connection settings: Coordinator

The screenshot displays the ST-PowerLine GUI interface. At the top, there are icons for PowerLine Sniffer, Plugin Settings, Plugin Information, and ST PowerLineGui. The main title bar reads "Coordinator node". On the left, the "ST-PowerLine Object Tree" is visible, with "TOOLS" highlighted in a pink box. The main workspace shows the "IPv6 Packet Generator" configuration for two nodes: "ST_G3 Node-1 (COM11)" and "ST_G3 Node-2 (COM9)".

For "ST_G3 Node-1 (COM11)", the "Source Address" section is highlighted with a blue arrow. It shows "Type: LINK_LOCAL_UNICAST_ADDRESS", "macPanId: UInt16 [Hex] 781D", "macShortAddress: UInt16 [Hex] 0000" (labeled "Coordinator"), and "Interface ID: UInt64 [Hex] 781D00FFFE000000". The resulting address "FE80000000000000781D00FFFE000000" is shown in a box at the bottom.

For "ST_G3 Node-2 (COM9)", the "Destination Address" section is highlighted with a blue arrow. It shows "Type: LINK_LOCAL_UNICAST_ADDRESS", "macPanId: UInt16 [Hex] 781D", "macShortAddress: UInt16 [Hex] 0002" (labeled "Device"), and "Interface ID: UInt64 [Hex] 781D00FFFE000002". The resulting address "FE80000000000000781D00FFFE000002" is shown in a box at the bottom.

Remote Address for Device, to be copied into the related UDP_Control menu (Node-2)

Remote Address for Coordinator, to be copied into the related UDP_Control menu (Node-1)

UDP settings: Coordinator

Coordinator node

1

Set parameters

2

Click on UDP-CONN-SET.Request

UDP-CONN-SET.Request

ConnID 1

RemoteAddress UInt128 [Hex] FE80000000000000781D00FFFE000002

RemotePort UInt16 [Hex] 2222

LocalPort UInt16 [Hex] 1111

UDP-CONN-GET.Request

ConnID 0

ST-PowerLine Object Tree

- ST-PowerLine Host
 - Node-1
 - COM
 - PHY
 - MAC
 - ADP
 - BOOT
 - IPv6
 - UDP_Control
 - G3LIB
 - G3LIB_IB

ST-PowerLine Trace Window

	Time	Device	Message	Error	Info
	14:23:05.261	COM11	<-- G3UDP-CONNECTION-SET.C	SUCCESS	Status: G3_SUCCESS
	14:23:05.256	COM11	--> G3UDP-CONNECTION-SET.R		ConnId: 1 RemoteAddress: 0xFE80000000000000781D00FFFE000002 RemotePort: 0x2222 LocalPort: 0x1111

UDP settings: Device

Device node

ST-PowerLine Object Tree

- ST-PowerLine Host
 - Node-1
 - COM
 - PHY
 - MAC
 - ADP
 - BOOT
 - IPv6
 - UDP_Control
 - G3LIB

ST_G3 Node-1 (COM11) ST_G3 Node-2 (COM9) +

1 Set parameters

2 Click on UDP-CONN-SET.Request

UDP-CONN-SET.Request ConnID 2

RemoteAddress UInt28 [Hex] FE80000000000000781D00FFFE000000

RemotePort UInt16 [Hex] 1111

LocalPort UInt16 [Hex] 2222

UDP-CONN-GET.Request ConnID 0

ST-PowerLine Trace Window

	Time	Device	Message	Error	Info
+	14:24:36.566	COM9	<-- G3UDP-CONNECTION-SET.C	SUCCESS	Status: G3_SUCCESS
+	14:24:36.560	COM9	--> G3UDP-CONNECTION-SET.R		ConnId: 2 RemoteAddress: 0xFE80000000000000781D00FFFE000000 RemotePort: 0x1111 LocalPort: 0x2222
+	14:23:05.261	COM11	<-- G3UDP-CONNECTION-SET.C	SUCCESS	Status: G3_SUCCESS
+	14:23:05.256	COM11	--> G3UDP-CONNECTION-SET.R		ConnId: 1 RemoteAddress: 0xFE80000000000000781D00FFFE000002 RemotePort: 0x2222 LocalPort: 0x1111

Coordinator vs Device

PowerLine Sniffer Plugin Settings Plugin Information ST PowerLineGui

Coordinator node

ST-PowerLine Object Tree

- ST-PowerLine Host
 - Node-1
 - COM
 - PHY
 - MAC
 - ADP
 - BOOT
 - IPv6
 - UDP_Control

ST_G3 Node-1 (COM11) ST_G3 Node-2 (COM9) +

3

DATA.Request

UDP

UDP_NORMAL_ID

DestAddress UInt128 [Hex] 00000000000000000000000000000000

Type: Hex Ascii 6646D49CB22919F781F147E9654926E3B203C083CF0CD34F4238ABDB762D07921D906D5549C6A6CE4B07299DAA188CB1E164ED05B449C75A73845A7A7E3D8154E9B5CCD5DCD199EC5CF237C8E335A429ACF9FA113F02DDD3C813E1C46C2C4F0E86D5B3F44CB7D510CB01A8C212FE773DE030CD84426F14E7D8F80CC9EFD47F2FA229420D82AFDDF524EA453D591BC1CA9CA4E43C5ECBCB16C0CB1C54AB0C20F682781FE8BC69BA3052D8605729D78EBD36412D4AEF43D0D75D2B4DB693894918CA4FBBE0FBD90D32E9B4E9866B74ECE83D5F1D69DFD5063FA7488B901B039DC98E478DDA1CADC15D34FA613B594A6BE83E6479336BE038F4487C38B24D7D17E51620F723E612CC909DC03

Length: 0x04B0 1200

Random Max Size: 1200

Generate Random

1

Same as RemotePort

Handle UInt8 [Hex] 00

DestPort UInt16 [Hex] 2222

ConnID 1

Set parameters

2

Edit packet size, then click on Generate Random

ST-PowerLine Trace Window

	Time	Device	Message	Error	Info
	14:25:30.869	COM9	<-- G3UDP-DATA.Indication	SUCCESS	SrcAddr: FE80000000000000781D00FFFE000000 - SrcPort: 1111 - DstAddr: FE80000000000000781D00FFFE000002 - DstPort: 2222 - Data:
	14:25:30.724	COM11	<-- G3UDP-DATA.Confirm	SUCCESS	Status: G3_SUCCESS Handle: 00
	14:25:30.116	COM11	--> G3UDP-DATA.Request		Data 0x6646D49CB22919F781F147E9654926E3B203C083CF0CD34F4238ABDB762D07921D906D5549C6A6CE4B07299DAA188CB1E164ED

G3 UDP Data Confirm to Coordinator (COM11) and G3 UDP Data Indication to Device (COM9)

Device vs Coordinator

PowerLine Sniffer Plugin Settings Plugin Information ST PowerLineGui

ST-PowerLine Object Tree

- COM
 - PHY
 - MAC
 - ADP
 - BOOT
 - IPv6
 - UDP_Control
 - G3LIB
 - G3LIB_IB
 - G3LIB_IB_EX

ST_G3 Node-1 (COM11) ST_G3 Node-2 (COM9) +

Device node

3

DATA.Request

UDP

UDP_NORMAL_ID

DestAddress UInt128 [Hex] FE80000000000000781D00FFFE000000

Type: Hex Ascii

Length: 0x04B0 1200

Random Max Size: 1200

Generate Random

1

Same as RemotePort

Handle UInt8 [Hex] 00

DestPort UInt16 [Hex] 1111

ConnID 2

Set parameters

2

Edit packet size, then click on Generate Random

ST-PowerLine Trace Window

	Time	Device	Message	Error	Info
	14:30:48.795	COM11	<-- G3UDP-DATA.Indication	SUCCESS	SrcAddr: FE80000000000000781D00FFFE000002 - SrcPort: 2222 - DstAddr: FE80000000000000781D00FFFE000000 - DstPort: 1111 - Data:
	14:30:48.691	COM9	<-- G3UDP-DATA.Confirm	SUCCESS	Status: G3_SUCCESS Handle: 00
	14:30:48.073	COM9	--> G3UDP-DATA.Request		Data 0x53A37D47CD143911361BDA44465B33CC0C6D96D1ACA5152A4B1A652CD298F308BBF3BA1A48BC21BEB813F330CABC8C2774F5

G3 UDP Data Confirm to Device (COM9) and G3 UDP Data Indication to Coordinator (COM11)

Thank you

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