STM32 X-NUCLEO-PLM SETUP Instructions

1. Program the dev board with the appropriate bin file using the STM32CubeProgrammer utility,

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1. Open the utility. In the top right, select the ST-LINK programmer and connect to the board. The utility identifies the MCU target during this process, so there’s no need to select it manually.
2. Select the “Erase & Programming” tab and add the path to the bin file you want to upload in the “file path” box by clicking the “Browse” button and navigating to the bin file location on your computer.   
   A screenshot of a computer program

   AI-generated content may be incorrect.

A screenshot of a computer

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1. Jumper Configurations

Nucleo DEV boards,

J7 – jumper positions 1 & 2

J8 – jumper positions 1& 2

Arduino DEV boards,

J7 – jumper positions 2 & 3

J8 – jumper positions 2 & 3

A blue circuit board with black and white wires

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1. ST7580\_x-nucleo-GUI Ping Example   
   Data was transmitted and received by slave correct but,  
   a. Why the “Ping not OK” errors on the master side?  
   b. Why does the master send three additional bytes 0x04 0x00 0x0E in addition to the payload data? 0x04 = byte 0 of DataRequest (e.g. Custom / MIB frequency = 0, Frequency overwrite = 0, Frequency set = 1, Gain selector =0, Frame modulation = 0, Zero crossing synchronization = 0), 0x0E = ping frame count or number of pings done in the current ping session (not required by modem, use for GUI or firmware only).

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Master sends:   
 FRAME: STX|PAYLOAD SIZE|DL\_DataRequest|PAYLOAD|16-bit CRC  
 HEX: 02 | 0B | 50 | 04 00 0E 01 23 45 67 89 AB CD EF | 5D 04

**PAYLOAD**: DataRequestConfigurations + FRAME COUNT + DATA  
 **DataRequestConfigurations (Byte 0)**: 0x04

* Custom / MIB frequency = 0
* Frequency overwrite = 0
* Frequency set = 1
* Gain selector =0
* Frame modulation = 0
* Zero crossing synchronization = 0

**DataRequestConfigurations (Byte 1)**: 0x00

* Slave ADDR set in the GUI

**FRAME COUNT**: 0x0E

* + - * Ping frame count or number of pings done in the current ping session (not required by modem, use for GUI or firmware only).

**DATA** = 01 23 45 67 89 AB CD EF

**16-bit CRC =** PAYLOAD SIZE + DL\_DataRequest + PAYLOAD = 0x045D (sent LSByte first)

Screens screenshot of a computer program

AI-generated content may be incorrect.

1. ST7580\_x-nucleo-GUI Data Request

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A screenshot of a computer program

AI-generated content may be incorrect.

Master sends:   
 FRAME: STX|PAYLOAD SIZE|DL\_DataRequest|PAYLOAD|16-bit CRC  
 HEX: 02 | 02 | 50 | 04 AB | 01 01

**PAYLOAD**: DataRequestConfigurations + DATA  
 **DataRequestConfigurations (Byte 0)**: 0x04

* Custom / MIB frequency = 0
* Frequency overwrite = 0
* Frequency set = 1
* Gain selector =0
* Frame modulation = 0
* Zero crossing synchronization = 0

**DATA** = AB

**16-bit CRC =** PAYLOAD SIZE + DL\_DataRequest + PAYLOAD = 0x0101 (sent LSByte first)

Master Receives:

FRAME: STX|PAYLOAD SIZE|DL\_DataConfirm|PAYLOAD|16-bit CRC  
HEX: 02 | 05 | 51 | 54 54 00 F2 9E | 8E 02

**PAYLOAD**: ConfirmData

ConfirmData **(Byte 0)**: 0x54 (0b01010100)

* Max temp (bit 0-1) = 0b00 = T < 70 deg (typical)
* Max gain (bit 2-6) = 0b10101 = ?
* Bit 7 is unused

ConfirmData **(Byte 1)**: 0x54 (0b01010100)

* Min temp (bit 0-1) = 0b00 = T < 70 deg (typical)
* Min gain (bit 2-6) = 0b10101 = ?
* Bit 7 is unused

ConfirmData **(Byte 2)**: 0x00 (0b00000000)

* Overcurrent events num. (bit 0-6) = 0b000000 = 0 OVC events
* Overcurrent notification (bit 7) = 0 = max. output current value not reached

ConfirmData **(Byte 3-4)**: 0xF29E (0b1111001010011110)

* ZC delay = ? (need to confirm how to calc this since value is signed)

**16-bit CRC =** PAYLOAD SIZE + DL\_ DataConfirm + PAYLOAD = 0x028E (sent LSByte first)

Slave Receives:   
 FRAME: STX|PAYLOAD SIZE|DL\_DataIndication|PAYLOAD|16-bit CRC  
 HEX: 02 | 05 | 52 | 18 19 0D 5C AB | 9C 01

**PAYLOAD**: IndicaionData + MASTER DATA (PHY PAYLOAD)  
 IndicaionData **(Byte 0)**: 0x18 (0b00011000)

* Frame Modulation (bit 0-2) = 0b000 = B-PSK
* RX Channel (bit 3) = 1 = high channel
* PGA value (bit 4-7) = 0b0001 = -12dB (RXIN max range 8Vpp)

IndicaionData **(Byte 1)**: 0x19 (0b00011001)

* SNR = ?
  + Estimated over the Unique Word reception (signed value, valid for PSK received frames only, equal to 255 – no meaning – for FSK received frames)

IndicaionData **(Byte 2)**: 0x0D (0b00001101)

* ZC delay = 13 \* 13 µs = 169 µs (double-check this, likely wrong since this is a signed value)
  + Delay between the received UW last bit and the mains zerocrossing (signed value), expressed in 13 µs step

**MASTER DATA** = 0xAB

**16-bit CRC =** PAYLOAD SIZE + DL\_ DataIndication + PAYLOAD = 0x019C (sent LSByte first)