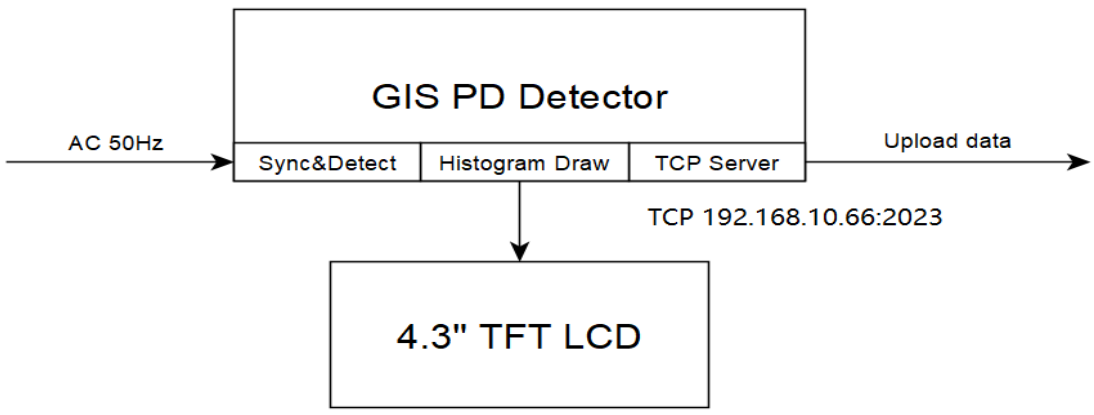
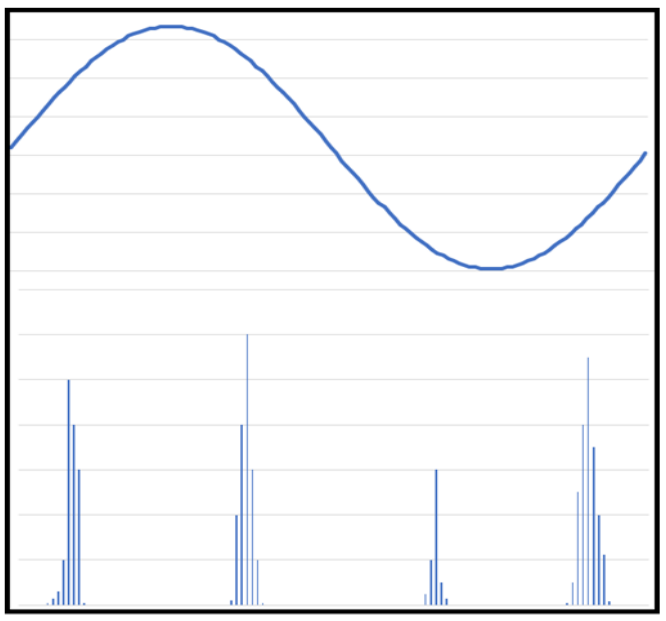
GIS PD Detector Communication Protocol V0.1

1. Basic Topology





2. UART over TCP

UART Packet Structure

Sync Head	Packet Length	AC 50Hz Phase Difference	Accumulated Photons Count	Total Gaps No.	Sub Gap No.	Time Interval	Checksum
2 bytes	2 bytes	2 bytes	2 bytes	2bytes	2 bytes	1 byte	1 byte
55 AA	00 0A	00 24=36 00 48=72 00 6C=108 00 90=144 00 B4=180 00 D8=216 00 FC=252 01 20=288 01 44=324 01 68=360	53 BF	00 0A	00 01 00 02 00 03 00 04 00 05 00 06 00 07 00 08 00 09 00 0A		

Description:

Sync Head:

Fixed data, 0x55 0xAA.

Packet Length:

The total length in byte units involves “AC 50Hz Phase Difference” + “Photons Count” + “Checksum”. (2 bytes length for future extension.)

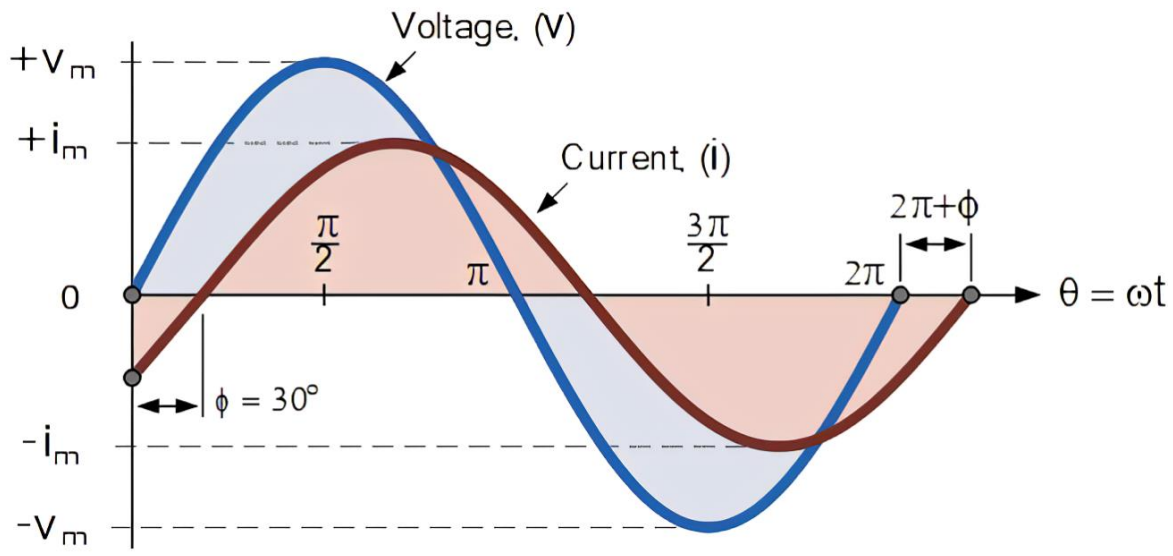
AC 50Hz Phase Difference:

The phase difference of one period, see more in the following figure.

For wide gaps, the possible values are 0°, 90°, 180°, 270°, and 360°.

For narrow gaps, the possible values are 0°, 45°, 90°, 135°, 180°, 225°, 270°, 315°, and 360°.

The entire 360°C can be divided indefinitely according to our needs.



AC 50Hz Phase Difference Demonstration

Accumulated Photons Count: The photon pulse count accumulated in a fixed time interval.

Total Gaps No: Indicate how many gaps one sine wave contains.

Sub Gap No: Show sub gap number, range 0 ~ Total Gaps No. -1.

Time Interval: How long the accumulated Photons Count takes up, it’s maybe 100uS, 1mS, 10mS, 100mS, 1S, etc.

Checksum: The checksum value of “Sync Head” + “Packet Length” +”AC 50Hz Phase Difference” + “Accumulated Photon Count”.

April 18, 2023