



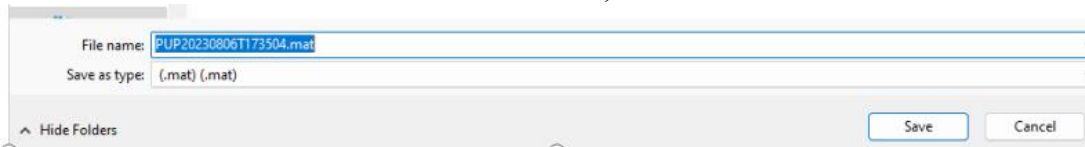
Data recording operation manual

1. Preparing

- (1) Run Matlab GUI, push Refresh button to connect to radar device, push Start button to start.
- (2) Set Transmitter, Receiver, modulation, Bandwidth, Sweep-Time, Sampling-Number etc.

2. Recording

- (1) Select Recording Time. for example: 10s
- (2) Push Record button, the display window will stop displaying and start to record raw data.
- (3) Waiting for 10s, a file save window will appear with a default name like PUP20230806T173504.mat, which includes the date and time information: 08/06/2023, 17:35:04.



- (4) You can use the default name or assign a new name to it and push save button.
- (5) The GUI will restore its display after file is saved.

3. Data loading

- (1) Use “load” command in Matlab command window to read the raw data in. For example:
“Load PUP20230806T173504”

After this load command, the raw data matrix and some necessary variables are loaded automatically.

- (2) Use “whos” to observe the data and variables loaded.

When Transmitter select Tx1, the list is:

```
>> whos
Name                Size                Bytes  Class    Attributes
ComplexDataTx1      256x15946            65314816 double    complex
DATE                1x20                  40 char
LAFH                 1x1                    8 double
LAFI                 1x1                    8 double
LAMS                 1x2                     4 char
LANR                 1x1                    8 double
LANT                 1x1                    8 double
LARS                 1x3                     6 char
LASN                 1x1                    8 double
LAST                 1x1                    8 double
LATS                 1x3                     6 char
```

When Transmitter select Tx2, the list is:

```
>> whos
Name                Size                Bytes  Class    Attributes
ComplexDataTx2      256x15946            65314816 double    complex
DATE                1x20                  40 char
LAFH                 1x1                    8 double
LAFI                 1x1                    8 double
LAMS                 1x2                     4 char
LANR                 1x1                    8 double
LANT                 1x1                    8 double
LARS                 1x3                     6 char
LASN                 1x1                    8 double
LAST                 1x1                    8 double
LATS                 1x3                     6 char
```

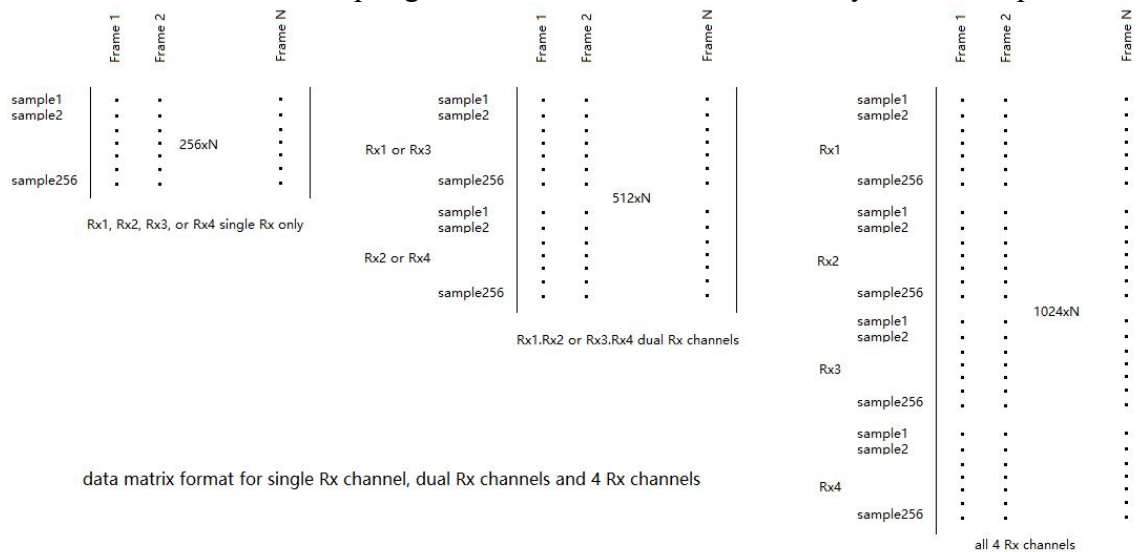
When Transmitter select Tx1.Tx2, the list is:

```
>> whos
Name          Size          Bytes  Class  Attributes
ComplexDataTx1 256x17992      73695232 double complex
ComplexDataTx2 256x17992      73695232 double complex
DATE          1x20           40 char
LAFH          1x1            8 double
LAFI          1x1            8 double
LAMS          1x2            4 char
LANR          1x1            8 double
LANT          1x1            8 double
LARS          1x3            6 char
LASN          1x1            8 double
LAST          1x1            8 double
LATS          1x7            14 char
```

The definition of variables are:

| | | |
|-------|-----------------------------------|------------------------------|
| DATE: | data file saving time, example: | DATE ="06-Aug-2023 13:29:54" |
| LAFH: | upper frequency, example: | LAFH = 2.5000e+10 |
| LAFI: | lower frequency, example: | LAFI = 2.4000e+10 |
| LAMS: | modulation, example: | LAMS ="sawtooth" |
| LANR: | number of receivers, example: | LANR =1 |
| LANT: | number of transmitters, example: | LANT =1 |
| LARS: | Receiver Name String, example: | LARS ="Rx1" |
| LASN: | Sampling number, example: | LASN =256 |
| LAST: | Sweep Time, example: | LAST =5.000E-04 |
| LATS: | Transmitter Name String, example: | LATS ="Tx1" |

For the data matrix, the row is sampling number and column is frame, they are all complex numbers.



4. Data extraction code examples (ExtractRecordData.m):

```
load PUP20230806T192612
Tx1Rx1=ComplexDataTx1(1:256, :);
Tx1Rx2=ComplexDataTx1(257:512, :);
figure(1)
plot(abs(Tx1Rx1(:, 16)))
figure(2)
plot(abs(Tx1Rx2(:, 200)))
```

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