1. Serial Communication Protocol

1.1 Introduction

> Info
> This section uses the following notation:
> < >: One byte.
> [ ]: Optional fields.
> Numbers in Serial Commands are in hexadecimal format.
> For simplicity, the CRC field is omitted in the Serial Commands in the following sections.

DWIN DGUSII LCM is composed of 2 commands:

- 0x82: Write VPs (RAM)
- 0x83: Read VPs (RAM)

A Frame (or packet) structure follows this format:

```
<Frame Header H> <Frame Header L> <Byte Count> <Command> [<Data>...] [<CRC H> <CRC L>]
```

Or, in abbreviated notation:

```
<FHH> <FHL> <BC> <CMD> [<DATA>...] [<CRCH> <CRCL>]
```

- Frame Header: Identifies the start of a new Proculus Protocol packet. Can be used to uniquely identify
  a LCM on a communication bus. Fixed value (unchangeable) = 0x5AA5.
- Byte Count: Counts the number of bytes in the packet, excluding the Frame Header and this byte, i.e.,
  counts all the bytes starting from the Command byte.
- Command: Defines the Command to be executed.
- Data: Includes addresses, lengths and values.
- CRC: Optional error detection value.

1.2 VP (RAM) Commands

1.2.1 Write VPs (0x82)

This Command writes one or more VPs. You can write multiple VPS at once, if they are sequential

- **Format**

```
<FHH> <FHL> <BC> 82 <VP><VP> <VL1><VL1> [<VL2><VL2> <VL3><VL3> ...]
```

<VP><VP>: RAM Address.
<VL#><VL#>: Value(s) written.

- **Examples**

Write the value 1234 in VP 0x1000:

```
5A A5 05 82 1000 04D2
```

Write values on 4 sequential VPs, starting from VP 0x1000:

```
5A A5 0B 82 1000 0022 0071 0006 0031
```

Info
The address of the DGUS LCM read-write address is understood as the start address, and the maximum data length is 0xFF: For example, the effect of the following a and b instructions is equal to c, and the unit of the address is word
a: 5A A5 05 82 1000 000A
b: 5A A5 05 82 1002 000B
c: 5A A5 07 82 1000 000A 000B

1.2.2 Read VPs (0x83)

This Command reads one or more VPs. You can read multiple VPs at once, if they are sequential.

• Format

```
<FHH> <FHL> <BC> 83 <VP><VP> <LEN>
```

<VP><VP>: RAM Address.
<LEN>: Number of VPs (words) to read.
Answer from LCM:

```
<FHH> <FHL> <BC> 83 <VP><VP> <LEN> <VL1><VL1> [<VL2><VL2> <VL3><VL3> ...]
```

<VL#><VL#>: Value(s) read.

• Examples

Read the value in VP 0x1000:

```
5A A5 04 83 1000 01
```

Answer from LCM:

```
5A A5 06 83 1000 01 04D2
```

Read values on 4 sequential VPs, starting from VP 0x1000:

```
5A A5 04 83 1000 04
```

Answer from LCM:

```
5AA5 0C 83 0000 04 0022 0071 0006 0031
```

Info
The Command of “Answer from LCM” is Same format as the data format returned to the serial port after touching the touch button.