CentipedeManager.h

```
const uint8_t N_CP_PORTS = 8

typedef CP_Masks :
    std::array<uint16_t, N_CP_PORTS>
```

<struct> CP_Address

```
+ uint8_t   port
+ uint8_t   bit
```

CentipedeManager

```
- Centipede   _cp
- CP_Masks    _masks
+ CentipedeManager()
+ begin()
+ clear_masks()
+ add_to_masks(CP_Address)
+ set_masks(CP_Masks)
+ get_masks() : CP_Masks
+ all_masks_are_zero() : bool
+ report_masks(Stream &)
+ send_masks()
```

constants.h

```
const int8_t     PCS_X_MIN          = -7
const int8_t     PCS_X_MAX          = 7
const int8_t     PCS_Y_MIN          = -7
const int8_t     PCS_Y_MAX          = 7
const uint8_t    NUMEL_PCS_AXIS     =
      PCS_X_MAX - PCS_X_MIN         (= 15)
const uint8_t    NUMEL_LED_AXIS     = 16
const uint8_t    N_VALVES           = 112
const uint16_t   N_LEDS             =
      NUMEL_LED_AXIS * NUMEL_LED_AXIS
                                    (= 256)

const uint8_t    P2VALVE[][]
const uint8_t    P2LED[][]
const uint8_t    VALVE2CP_PORT[]
const uint8_t    VALVE2CP_BIT[]
```

translations.h

```
int8_t VALVE2P[][]

p2valve(P) : uint8_t
p2led(P) : uint8_t
valve2p(uint8_t) : P
init_valve2p()
valve2cp(uint8_t) : CP_Address
```

The most essential data structures used in the C++ code.

Dennis van Gils, 03-12-2022

ProtocolManager.h

```
const uint16_t  PROTOCOL_MAX_LINES = 5000        (← make as large as free RAM allows)
const uint16_t  MAX_POINTS_PER_LINE = NUMEL_PCS_AXIS * NUMEL_PCS_AXIS (= 225)
const int8_t    P_NULL_VAL                 = -128

typedef PointsArray : std::array<P, MAX_POINTS_PER_LINE + 1>
typedef Program     : std::array<PackedLine, PROTOCOL_MAX_LINES>
```

P ("Point in the Protocol Coordinate System")

```
+ int8_t    x
+ int8_t    y
+ P(int8_t = P_NULL_VAL, int8_t = P_NULL_VAL)
+ set(int8_t, int8_t)
+ set_null()
+ is_null() : bool
+ pack_into_byte() : uint8_t
+ unpack_byte(uint8_t)
+ print()
```

Line

```
+ uint16_t      duration
+ PointsArray   points
+ Line()
+ Line(uint16_t, PointsArray)
+ pack_into(PackedLine &)
+ print()
```

PackedLine

```
+ uint16_t      duration
+ std::array<uint16_t, NUMEL_PCS_AXIS>   masks
+ PackedLine()
+ unpack_into(Line &)
```

ProtocolManager

```
- CentipedeManager * _cp_mgr
- Program   _program
- char[64]  _name
- uint16_t  _N_lines
- uint16_t  _pos
- uint32_t  _tick
- Line       _last_activated_line
- Line       _line_buffer
+ ProtocolManager(CentipedeManager *)
+ clear()
+ add_line(Line) : bool
+ add_line(uint16_t, PointsArray) : bool
+ prime_start()
+ goto_line(uint16_t)
+ activate_buffer()
+ update()
```