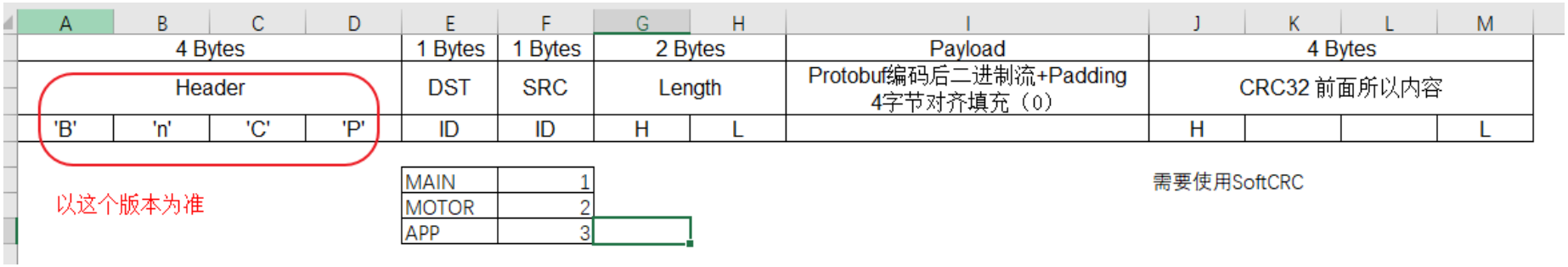
协议补充说明

数据帧头魔数为 `BnCP`

- excel 文件中描述错误



A	B	C	D	E	F	G	H	I	J	K	L	M
4 Bytes				1 Bytes	1 Bytes	2 Bytes		Payload	4 Bytes			
Header				DST	SRC	Length		Protobuf编码后二进制流+Padding 4字节对齐填充（0）	CRC32 前面所以内容			
'B'	'n'	'C'	'P'	ID	ID	H	L		H			L

以这个版本为准

MAIN	1
MOTOR	2
APP	3

需要使用SoftCRC

订阅电机状态

```
int motor_subscribe(void)
{
    UMainToMtr msg = U__MAIN_TO_MTR__INIT;
    MtrCmd mtr_cmd = MTR_CMD__INIT;

    mtr_cmd.ctrl_mode = MTR_CMD__CTRL_MODE__SUBSCRIBE;
    mtr_cmd.sample_rate = FINGER_STATUS_SAMPLE_RATE__RATE_50MS;
    msg.mtr_cmd = &mtr_cmd;
}

// 编码后的二进制数据
// 42 6e 43 50 02 01 00 06  12 04 08 7f 18 32 00 00 d9 59 20 9d
```

速度控制

- 标准化 -100 - 0 - 100
- 大于0表示向前运动
- 小于0表示向后运动

```
int motor_ctrl_set_speed(int8_t *speeds, uint8_t size)
{
    UMainToMtr msg = U__MAIN_TO_MTR__INIT;
    MtrCmd mtr_cmd = MTR_CMD__INIT;
    FingerStatus finger_status = FINGER_STATUS__INIT;

    if (speeds == NULL || size != MOTOR_NUM) {
        LOG_ERR("speeds is NULL");
        return -EINVAL;
    }

    msg.mtr_cmd = &mtr_cmd;
    mtr_cmd.ctrl_mode = MTR_CMD__CTRL_MODE__SPEED;
    mtr_cmd.expect_status = &finger_status;
    finger_status.speeds.data = speeds;
    finger_status.speeds.len = MOTOR_NUM;
}
```

位置控制

- 标准化 0 - 100
- 100表示完成握紧
- 0表示张开

```
int motor_ctrl_set_position(int8_t *positions, uint8_t size)
{
        UMainToMtr msg = U__MAIN_TO_MTR__INIT;
        MtrCmd mtr_cmd = MTR_CMD__INIT;
        FingerStatus finger_status = FINGER_STATUS__INIT;
```

```
        if (positions == NULL || size != MOTOR_NUM) {
                LOG_ERR("possitions is NULL");
                return -EINVAL;
        }

        msg.mtr_cmd = &mtr_cmd;
        mtr_cmd.ctrl_mode = MTR_CMD__CTRL_MODE__POSITION;
        mtr_cmd.expect_status = &finger_status;
        finger_status.positions.data = positions;
        finger_status.positions.len = MOTOR_NUM;

        motor_msg_send(&msg);
        return 0;
}
```