# CS2-MC Multifunction A/B Phase Counter

## ■ DESCRIPTION

**The CS2-MC provides dual input(A/B phase) and display with high speed, counting, control and communication (Modbus RTU mode) of Pulse from encoder, proximity switch, photo switch or flow meter for counting, length and position control. There are 3 external control input (DI) in standard and the optional 4 Relay, 1 Analogue, 1 Pulse and RS485 port available. The relays are also support N, C, R, E mode and Hi/Lo energized for batch / totalizer and position control.**


## ■ FEATURE

- **Measuring Pulse 0.01Hz~6KHz(A/B phase: 3KHz for each channel); Contact / NPN / PNP / Voltage Pulse can be switch on rear of meter**
- **Double figures，can be set to display the Totalizer 、Batch、Batch count**
- **CS2-MC Multifunction Counter design of the two groups pulse signal input, coupled with Proximity switch, Photoelectric sensor, Encoder ... .... etc., execution count(plus / less count), location-based, batch and other displays, control, and remote communication capabilities.**
- **4 relay can be individual programmed for N/R/C/E/do mode with timer function.**
- **3 external control input can be individual programmed for Reset, Gat of totalizer and/or batch**
- **Analogue Output and RS485(Modbus RTU mode) available in option**

## ■ Application

- **With the proximity switches, photoelectric switches, encoders ...etc., do the count (plus / less count), length, location, location,,batch etc. displays, control, and remote communication capabilities.**

## ■ ORDERING INFORMATION

**CS2-MC-** [Input Range] – [Relay Output] – [Analogue Output] – [RS 485 Port] – [AUX. POWER]

OPTION 1 OPTION 2 OPTION 3

Input mode and level can be changed by dip switches on real of meter

| CODE | | Input Range |
|---|---|---|
| C | 00 | Contact |
| N | | NPN |
| P | | PNP |
| V | | Voltage Pulse |
| | 05 | 5V Pulse |
| | 12 | 12V Pulse |
| | 24 | 24V Pulse |
| O | xx | Specify |

| CODE | Relay Output |
|---|---|
| N | None |
| R2 | 2 Relay |
| R4 | 4 Relay |

| CODE | Analogue Output |
|---|---|
| N | None |
| V | 0(1) ~ 5 V<br>0 ~ 10 V |
| I | 0 ~ 10 mA<br>0(4)~20 mA |

| CODE | RS485 Port |
|---|---|
| N | None |
| 8 | RS 485 |

| CODE | AUX. POWER |
|---|---|
| ADH | AC 85~265V<br>DC 100~300V |

## ■ TECHNICAL SPECIFICATION

**Input**

| Input Frequency | Input Mode | Input Level |
|---|---|---|
| 0.01Hz ~ 50 Hz | Mech. Contact | |
| **Up or Down Mode: 0.01Hz ~ 6 kHz**<br>**A/B Phase Mode: 0.01Hz ~ 3KHz(each)** | NPN | High Level: 8~12V; Low Level: 0.0~4.0 V (with excitation supply 12Vdc) |
| | PNP | |
| | Voltage Pulse | High Level: over 2/3 of input level Low Level: under 1/3 of input level |
| Input Mode(NPN, PNP, Contact) & Level(5Vp, 12Vp, 24Vp) changeable by dip switch of rear terminal block. | | |

**Input range:** **Up or Down Mode:** 0.01Hz~6kHz
**A/B Phase Mode:** 0.01Hz~3kHz(each channel)
⚠ when RS485 communication , limited to 0.01Hz~2kHz(each channel)

**Input type:** 7 type selectable:
- AbP-1: A/B phase with Quadrature x 1
- AbP-2: A/B phase with Quadrature x 2
- AbP-4: A/B phase with Quadrature x 4
- idu: dual individual input
- Cnd: Anti-Coincidence Add/Subtract
- UP: up counting
- doWn: down counting

**Trigger mode:**
- AU-bU: A and B are low level to high level
- AU-bd: A is low level to high level and B is high level to low level
- Ad-bU: A is high level to low level and B is low level to high level
- Ad-bd: A and B are high level to low level

**Display & Functions**

**LED:** **Numeric:**
**Up screen:** 10 digits, 0.28" red high-bright LED
**Down screen: 6 digits, 0.28" green high-bright**
**Relay output indication: 4 square red LED**
**RS 485 communication: 1 square orange LED**
**E.C.I. function indication: 3 square green LED**

**Up screen selection:** Can be set show Totalizer or Batch count
**Down screen** Can be set show Batch
**Display the multiplier:** CntSF set range: 0.10000~9.99999
**Display value=pulse x multiplier(CntSF)**
**Decimal Point:** Settable: 0 / 0.0 / 0.00 / 0.000 / 0.0000 / 0.00000

**Over Flow indication:** Fixed Re-cycle counting
**Default start value fun.:** Settable 0~999999

**Control Functions(option)**

| | |
|---|---|
| Relay: | 4 relay<br>relay 2 & 3: FORM-C, 5A/230Vac, 10A/115V<br>relay 1 & 4: FORM-A, 1A/230Vac, 3A/115V |
| Energized mode: | N / R / C / E mode or DO mode |
| N / R / C / E mode: | [rY.ot] Period of Relay on: 0:00.0~9(m):59.9(s) |
| DO Fun.: | Energized by RS485 command of master |

**Analogue output(option)**

| | |
|---|---|
| Accuracy: | ≤ ± 0.1% of F.S.; 16 bits DA converter |
| Ripple: | ≤± 0.1% of F.S. |
| Response time: | ≤100 m-sec. (10~90% of input) |
| Isolation: | AC 2.0 KV between input and output |
| Output range: | Specify either Voltage or Current output in ordering<br>Voltage: 0~5V / 0~10V / 1~5V programmable<br>Current: 0~10mA / 0~20mA / 4~20mA |
| Output capability: | Voltage: 0~10V: ≥ 1000Ω;<br>Current: 4(0)~20mA: ≤ 600Ω max |
| Functions: | [ AoLS] output range low to versus the value of parameter<br>Settable range -199999~999999(Batch) /<br>-1999999999~9999999999(Total)<br>[AoHS] output range high to versus the value of parameter<br>Settable range -199999~999999(Batch) /<br>-1999999999~9999999999(Total) |
| Digital fine adjust: | [AoPro] Settable range : -32768~32767<br>[AoSPn] Settable range : -32768~32767 |

**RS 485 Communication(option)**

| | |
|---|---|
| Protocol: | Modbus RTU mode |
| Baud rate: | 1200/2400/4800/9600/19200 programmable |
| Data bits: | 8 bits |
| Parity: | Even、Odd or none (with 1 or 2 stop bit) settable |
| Address: | 1 ~ 255 programmable |
| Distance: | 1200M max |
| Terminate resistor: | 150Ω. |

**Power**

| | |
|---|---|
| Power supply: | AC 85~265V / DC 100~300V |
| Excitation supply: | DC 12V/30mA |
| Power consumption: | ≤ 5.0VA maximum |
| Back up memory: | EEPROM |

**Electrical Safety**

| | |
|---|---|
| Dielectric strength: | AC 2.0 KV for 1 min,, Between Power / Input / Output / Case |
| Insulation resistance: | ≥100M ohm at 500Vdc, Between Power / Input / Output / Case |
| Isolation: | Between Power / Input / Output |
| EMC: | EN 55011:2002; EN 61326:2003 |
| Safety (LVD): | EN 61010-1:2001 |

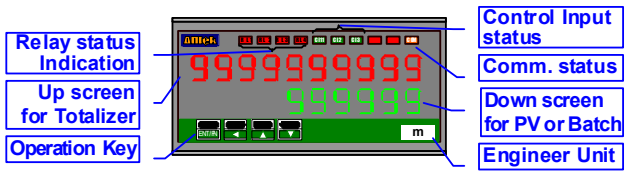
**Environmental**

| | |
|---|---|
| Operating temp.: | 0~60 ˚C |
| Operating humidity: | 20~95 %RH, Non-condensing |
| Temp. coefficient: | ≤ 100 PPM/˚C |
| Storage temp.: | -10~70 ˚C |
| Enclosure: | Front panel: IEC 549 (IP54); Housing: IP20 |
| Vibration test: | 1~800Hz, 3.175g²/Hz |

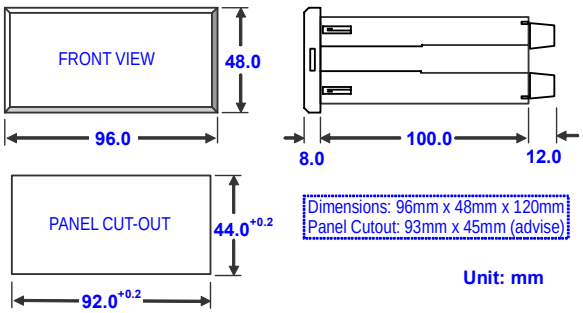
Mechanical

| | |
|---|---|
| Dimensions: | 96mm(W) x 48mm(H) x 120mm(D) |
| Panel cutout: | 92mm(W) x 44mm(H) |
| Case material: | ABS fire-resistance (UL 94V-0) |
| Mounting: | Panel flush mounting |
| Terminal block: | Plastic NYLON 66 (UL 94V-0);<br>10A/300Vac, M2.6, 1.3mm²~3.5mm² (16~12AWG) |
| weight: | 310g |

## ■FRONT PANEL

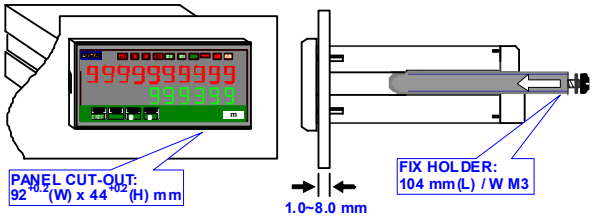



## ■DIMENSIONS

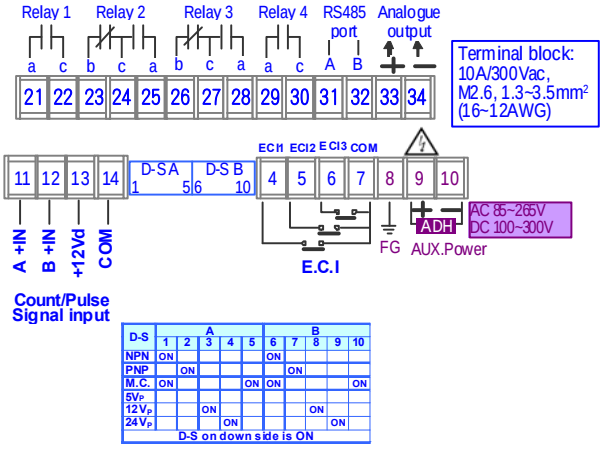



## ■INSTALLATION

The meter should be installed in a location that does not exceed the maximum operating temperature and provides good air circulation

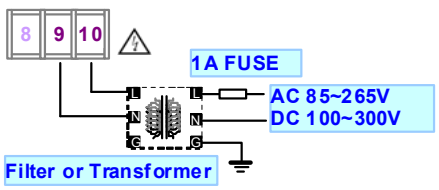



## ■CONNECTION DIAGRAM

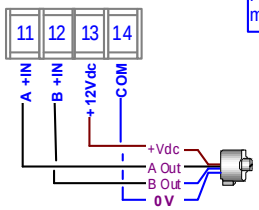



Please check the voltage of power supplied first, and then connect to the specified terminals. It is recommended that power supplied to the meter be protected by a fuse or circuit breaker

**Power Supply**



## Sensor input connection




Please change the dip-switch on rear of meter to match input the mode and level

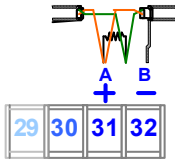
| D-S | A | | | | | B | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| NPN | ON | | | | | ON | | | | |
| PNP | | ON | | | | | ON | | | |
| M.C. | ON | | | | ON | ON | | | | ON |
| 5Vp | | | | | | | | | | |
| 12Vp | | | ON | | | | | ON | | |
| 24Vp | | | | ON | | | | | ON | |

D-S on down side is ON

⚠ **Connected to 11 (A + IN), 12 (B + IN) pin signal level required toclear the high and low potential,**

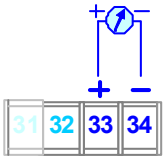
**Do not floating (high impedance).**

## RS485 Communication Port




**Max.Distance: 1200M**
**Terminate Resistor (at latest unit): 120~300ohm/0.25W (typical: 150ohm)**

## Analog retransmit output




# ■FUNCTION DESCRIPTION

## Display & Functions

**Display the multiplier:**

**Display value=pulse x multiplier(** (Cnt.SF)

Shows the multiplier can be set to the range of 0.100000 - 9.99999with a different decimal point position

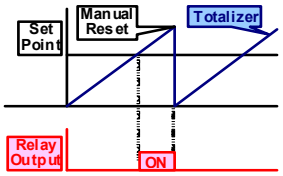
**Default start value fun.:**

Counter reset after the [inPUt GroUP]] in [oFSEt set the startingvalue (for example: 200),Will be starting from the default value (200) number of the startingproduct.

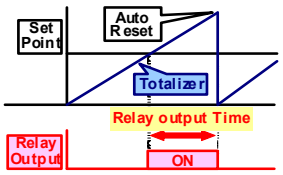
## Control Functions

Relay energized mode:

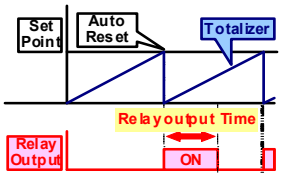
This table provides four relay output options, you can choose the corresponding control volume and mass execution N / R / C / E four control output



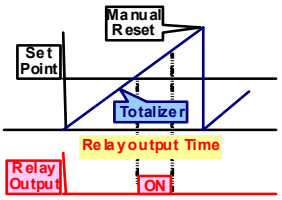

N MODE:
When the condition of Set Point is met.
1. the relay will be energized;
2. The totalizer will run as same as usual; until manual reset by front key or by rear terminal, the totalizer will be reseted to "0" and the relay will be de-energized.




R MODE:
When the condition of Set Point is met
1. The relay will be energized; until the time is over Relay output time (rY.1(or 2).ot).
2. The totalizer will run as same as usual; until the time is over Relay output time (rY.1(or 2).ot),The totalizer will be reseted to "0




C MODE:
When the condition of Set Point is met:
1. The relay will be energized; until the time is over Relay output time (rY.1(or 2).ot).
2. The totalizer will be reseted to "0", then counts-up from "0".




E MODE:
When the count reaches the set value:
1. relay output, until r Yot (Relay output time) to set time has elapsed,the relay will revert to the (de-energized)
2. count the number will continue to plot, until the
   ▶ button manual reset by the panel
   ▶ reverted by the ECI terminal short circuitCount value from "0" to re-plot several

DO(Digital Output):

Energized by RS485 command of master. The function was designed to get remote control by RS485 command of master. The typical application is to control a switch in field from computer center as like as digital output(DO) of PLC.

External Control Inputs (ECI):

The three external control inputs are individually programmable to perform specific meter control or display functions. All E.C.I. have been designed in level trigger actions. Please pay attention, the ECI1 or ECI2 input will be disable while UP or Down Key has been set to be "YES".

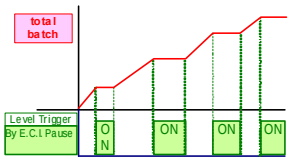
**Input mode:** 2 ECI points, Contact Implementation can be set individually and the total volume-related functions

Power or batch power reset:

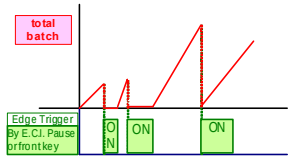
Total suspended and / or batch several the plot

reset of the total and / or batch to "0"

**Suspended total / batch**




**Reset of the total / batch**




**Enter the confirm time**: This function is mainly to avoid the scene of the disturbance caused by the malfunction surge; Please note, thistime setting is every 16 milliseconds (16msecond) for Units, please refer to the following example

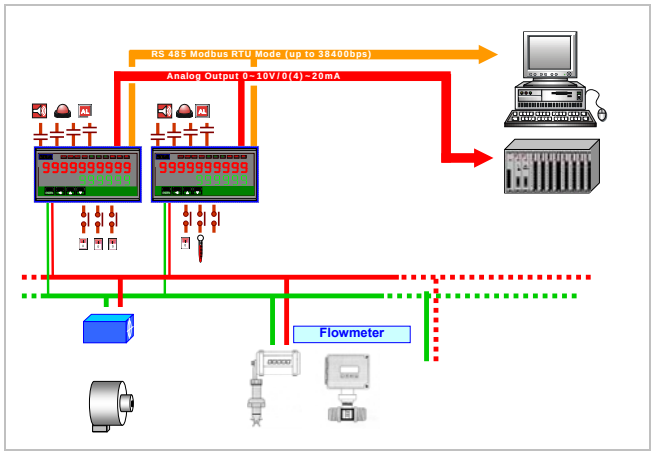
**[dEbnC]** set to be 5, it means

5 x 16 msecond = 80 msecond

That, contact input must be greater than 60msecond, the instrument Will identify the correct input, otherwise ignore this input.

## RS 485 communication(option)

The RS485's protocol is Modbus RTU mode, and baud rate up to 38400 bps. It's not only convenience to remote monitoring, display for reading and ECI status, but also for remote control in the case that doesn't have any DIO device in the field.



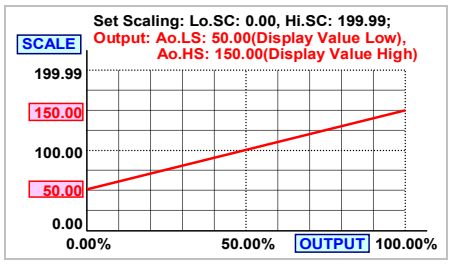

## Analogue output(option)

Please specify the output type either an 0~10V or 4(0)~20mA in ordering. The programmable output low and high scaling can be based on various display values. Reverse slope output is possible by reversing point positions.

**Output range:** Voltage: 0~5V / 0~10V / 1~5V programmable
Current: 0~10mA / 0~20mA / 4~20mA programmable

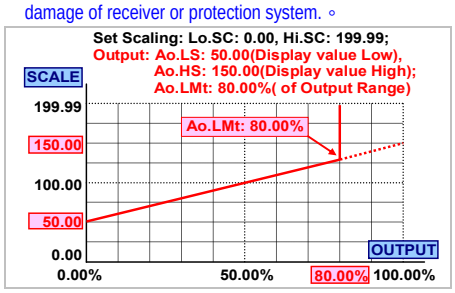
**Fun.:** **Ao.HS**: To setting the Display value High to versus output range High(as like as 20mA in 4~20)

**Ao.LS**: To setting the Display value Low to versus output range Low(as like as 4mA in 4~20)




*The range between **Ao.HS** and **Ao.LS** should be over 20% of span at least; otherwise, it will be got less resolution of analogue output.*

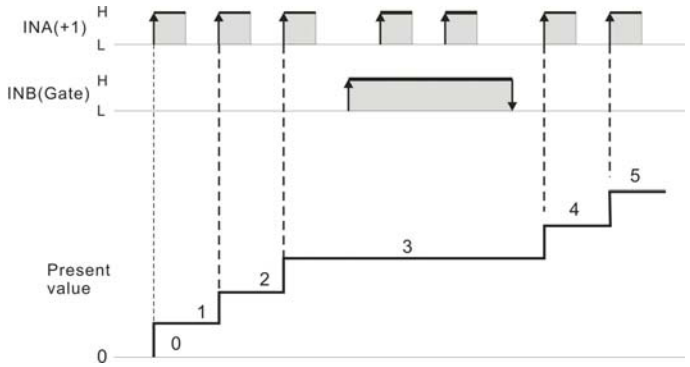
**Ao.LMt(Output High Limit)**: can be set range0.00~110.00% ; User can set the high limit of output to avoid a damage of receiver or protection system. ◦



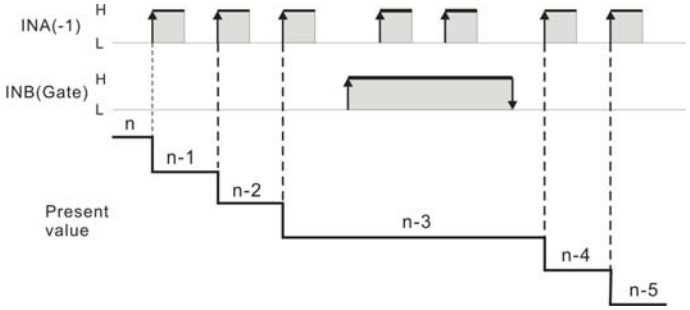

**Fine zero & span adjustment:**

Users can get Fine Adjustment of analogue output by front key of the meter. Please connect standard meter to the terminal of analogue output. To press the front key(up or down key) of meter to adjust and check the output.

UP mode:

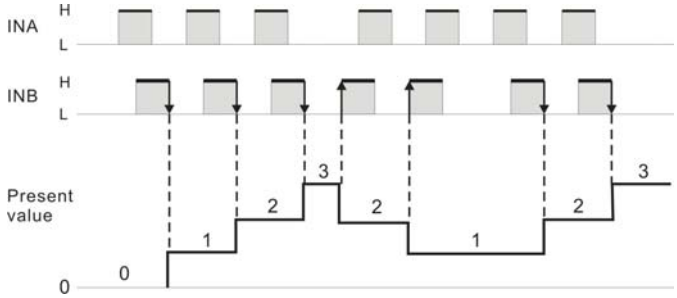



DOWM mode:

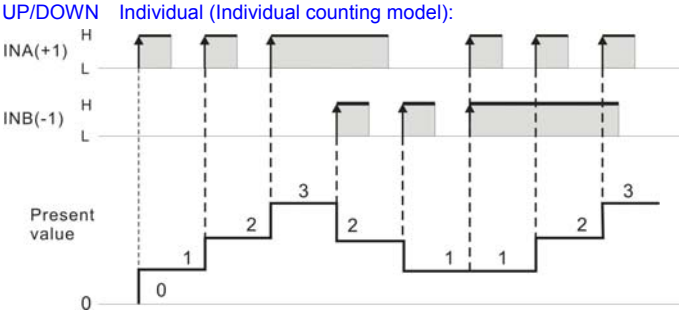



**Counting**

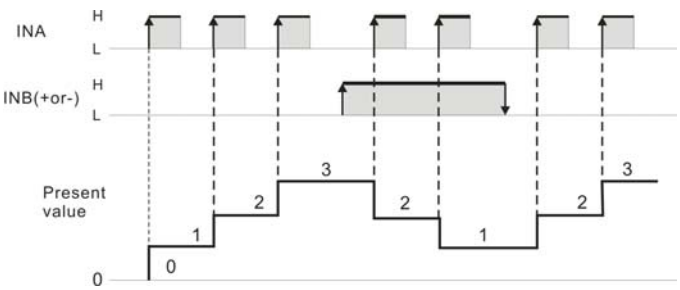
AB-PHASE:




UP/DOWN Individual (Individual counting model):




UP/DOWN Command(Command model)):




CS2-MC