

Alarms



Certs

HART

I/O

Isolators

Power

Pneumatic

RFI

Temp

Catalog



**The Interface Solution Experts**

**Tel : 02-784-2526 Fax : 02-784-2547**

Alarms



Certs

HART

I/O

Isolators

Power

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RFI

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# Isolation

- **Isolation**      ??      ↗??
- 
- 
- 2      **vs. 4**
- **Configurable vs. Fixed Range**
- **Qualification**

Alarms



Certs

HART

I/O

Isolators

Power

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RFI

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Catalog



# *Isolation / Isolators....*

- **Isolator 가**
- **(Basics)**
- **4 -**
- **Output Loop Powered (OLP)**
- **Input Loop powered (ILP)**
- **(Splitters)**
- **HART**

Alarms



Certs

HART

I/O

Isolators

Power

Pneumatic

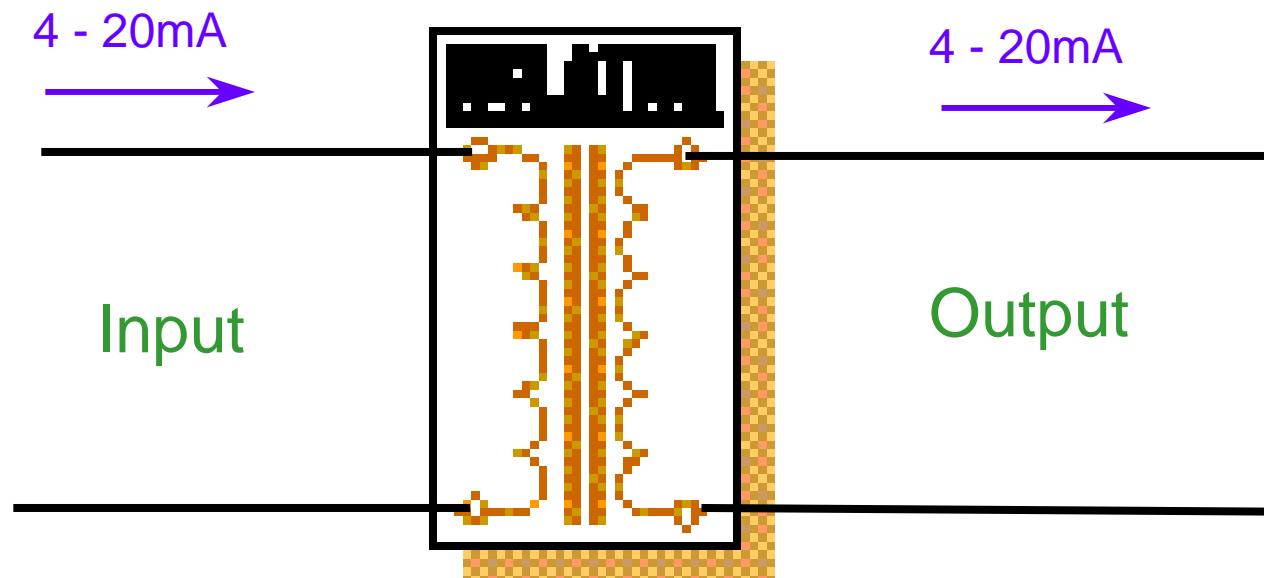
RFI

Temp

Catalog



# Isolator



- **Isolator**  
**(galvanic path )**

Alarms



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I/O

Isolators

Power

Pneumatic

RFI

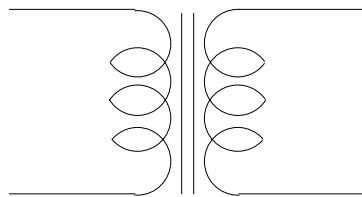
Temp

Catalog



# **Isolation** (Techniques)

## Transformer Isolator



- Transfers power
- 
- 
- 가
- 500 Vrms

## Optical Isolator



- CMNR digital
- 
- 
- 1,500 Vrms
-

Alarms



Certs

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Isolators

Power

Pneumatic

RFI

Temp

Catalog



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# *Ground Loops*

- **Ground loop ?**
- **가?**
- **?**

Alarms



Certs

HART

I/O

Isolators

Power

Pneumatic

RFI

Temp

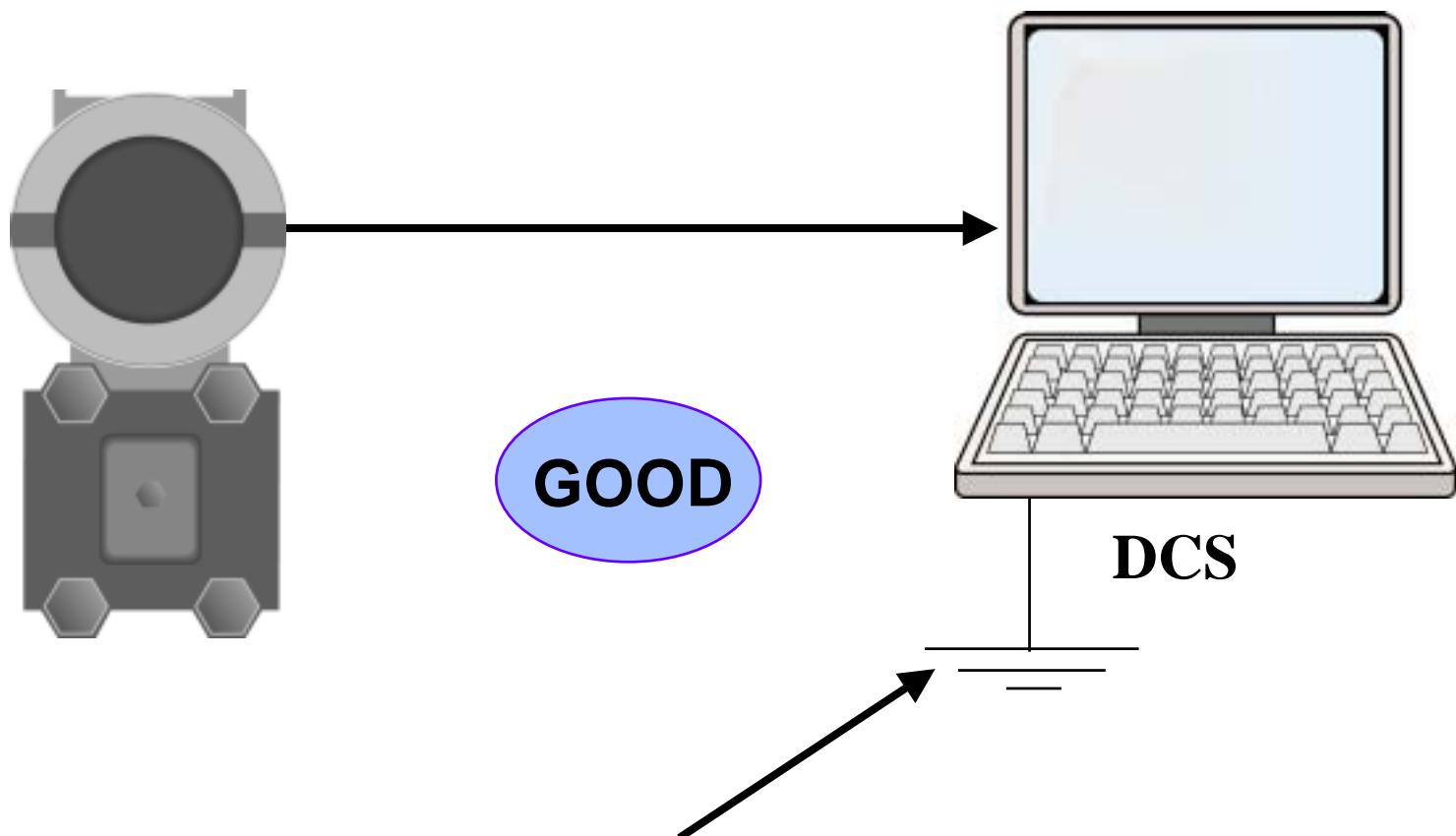
Catalog



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## (Normal Loop)



Note:

Alarms



Certs

HART

I/O

Isolators

Power

Pneumatic

RFI

Temp

Catalog



# Ground Loops

가 ?

## Ground loops

:

- 2 grounds

- 2 grounds

가

- 2 grounds  
Path)가

(Galvanic

.

Ohm's Law :  $V = I R$

Alarms



Certs

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I/O

Isolators

Power

Pneumatic

RFI

Temp

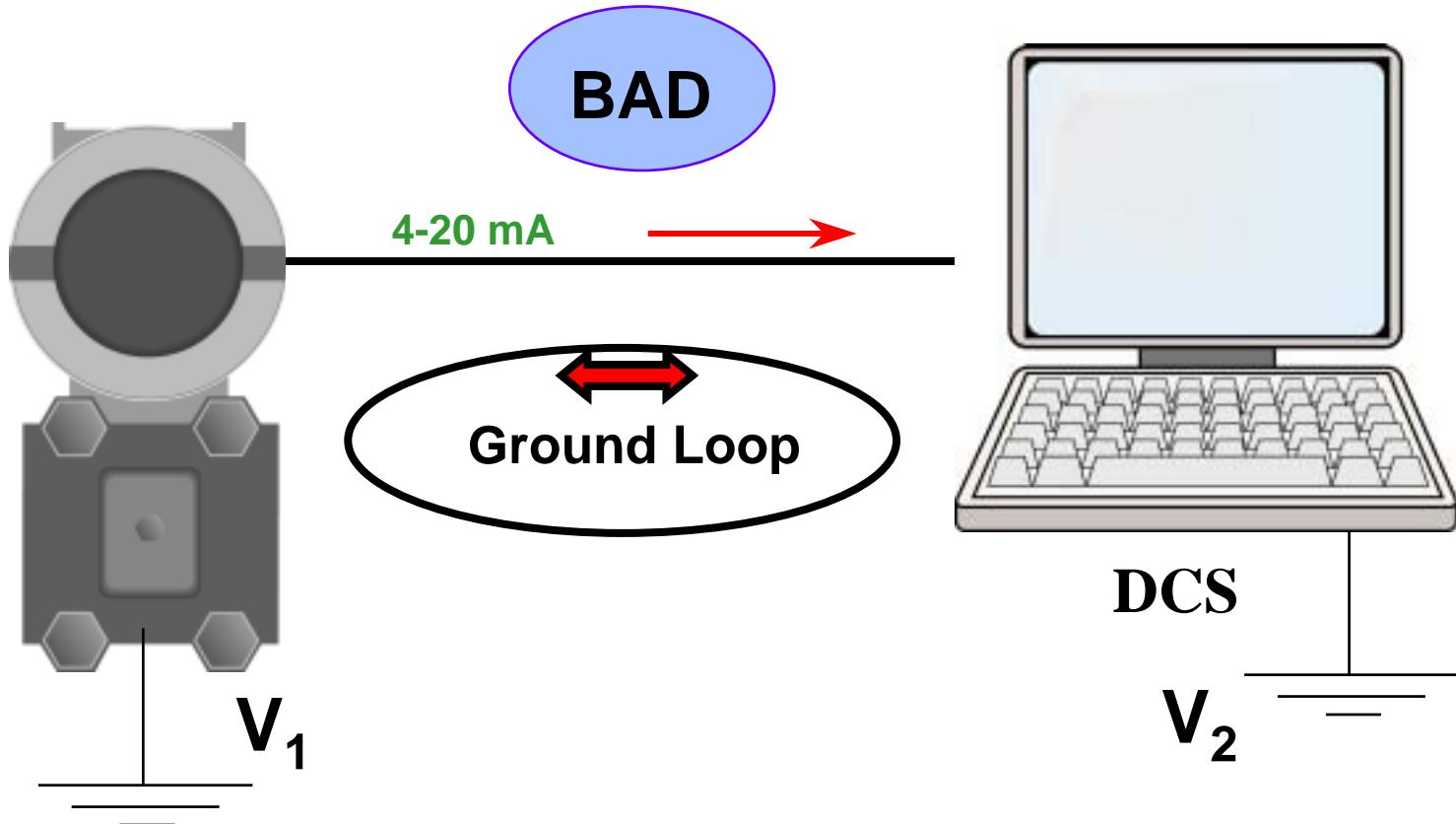
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# Ground Loop....



4-20mA ± Ground Loop

[Alarms](#)

?

[Certs](#)[HART](#)[I/O](#)[Isolators](#)[Power](#)[Pneumatic](#)[RFI](#)[Temp](#)[Catalog](#)

## Ground loop (漂遊)

### Ground

:

$$\begin{aligned} V_2 - V_1 &= 1 \text{ Volt} \quad \text{가} \\ R &= 2000 \text{ ohms} \end{aligned}$$

$$V = IR$$

$$I( )$$

:

$$I = V/R = 1/2000 = 0.0005 \text{ Amp} = 0.5 \text{ mA}$$

1/2 mA

4-20mA

span 16 mA

3%! 가

가

R( ) 1000 ohms

6 %가

Alarms



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I/O

Isolators

Power

Pneumatic

RFI

Temp

Catalog



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# Ground Loop

가

- ( Ground Potential)

가

- one ground :

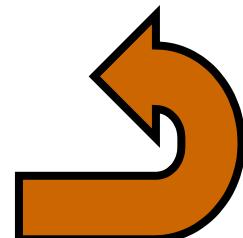
Ground

Ground

- (Galvanic path)

- Isolated Transmitters Receivers
- loop Isolators 가

가



Alarms



Certs

HART

I/O

Isolators

Power

Pneumatic

RFI

Temp

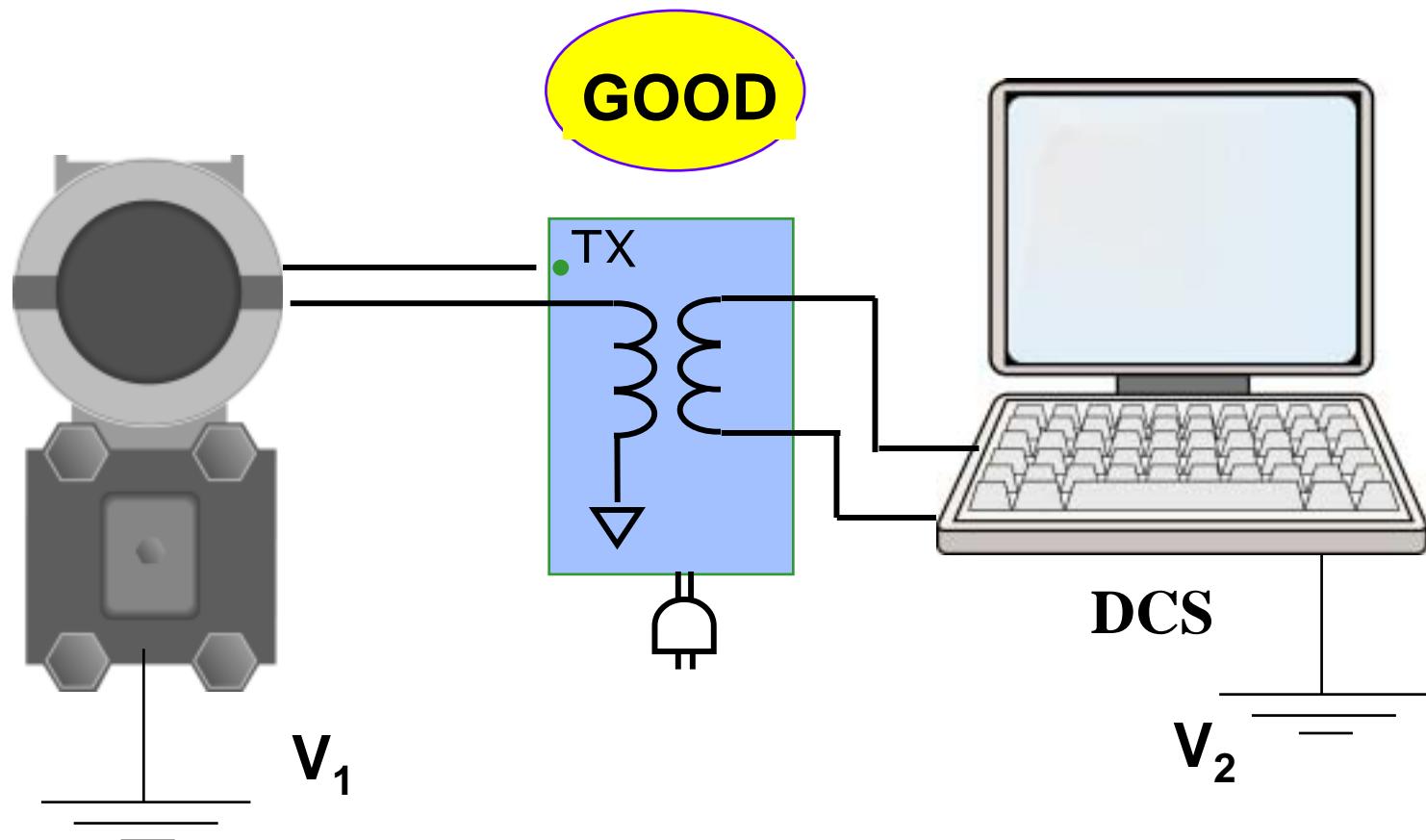
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# Loop Isolators



loop

(galvanic path)

ground

Alarms



Certs

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I/O

Isolators

Power

Pneumatic

RFI

Temp

Catalog



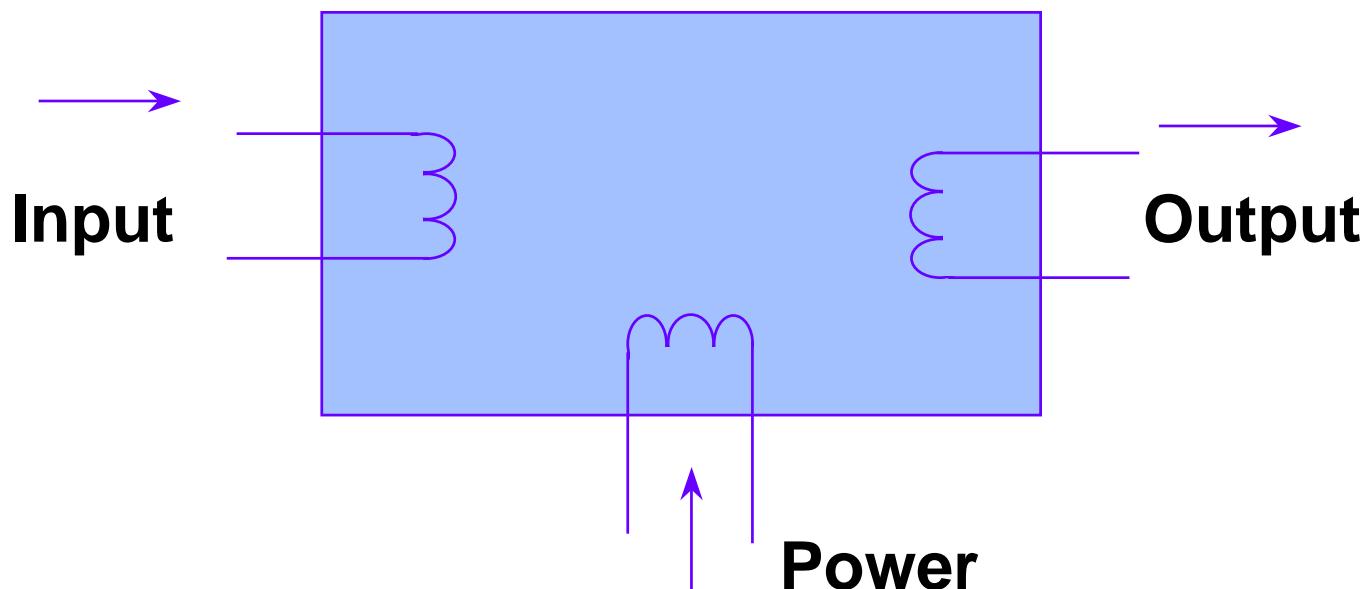
# *Isolator*

...

**(input),      (output),  
(galvanic path)**

:

**: Three-Way Isolation**



Alarms



Certs

HART

I/O

Isolators

Power

Pneumatic

RFI

Temp

Catalog



# *Isolation*

.....

**(Ground Loops)**

**(Area Isolation)**

**(Splitters)**

**(Bucking Power Supplies)**

**(Booster Applications)**

**(Signal Conversion)**

Alarms



Certs

HART

I/O

Isolators

Power

Pneumatic

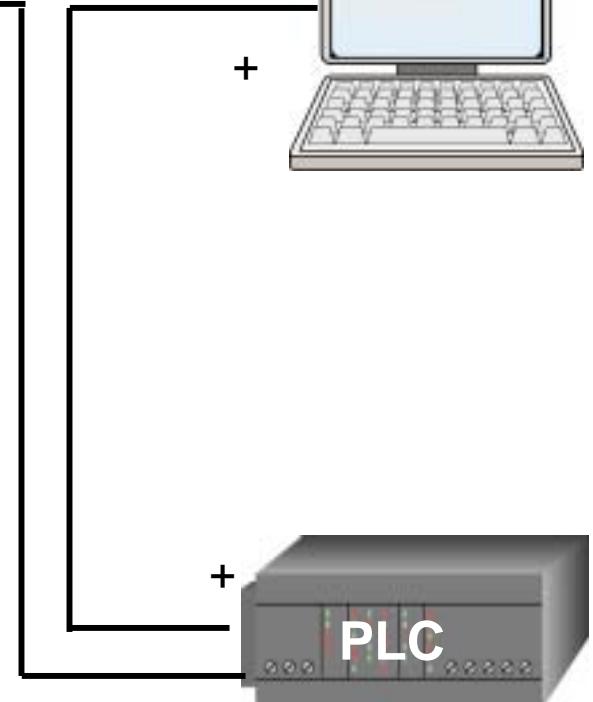
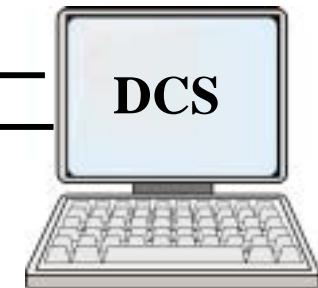
RFI

Temp

Catalog



## (Area Isolation)....



3가

DCS failure      PLC

1-                  PLC  
2- DCS      PLC

3- DCS      PLC      Ground loops 가

Alarms



Certs

HART

I/O

Isolators

Power

Pneumatic

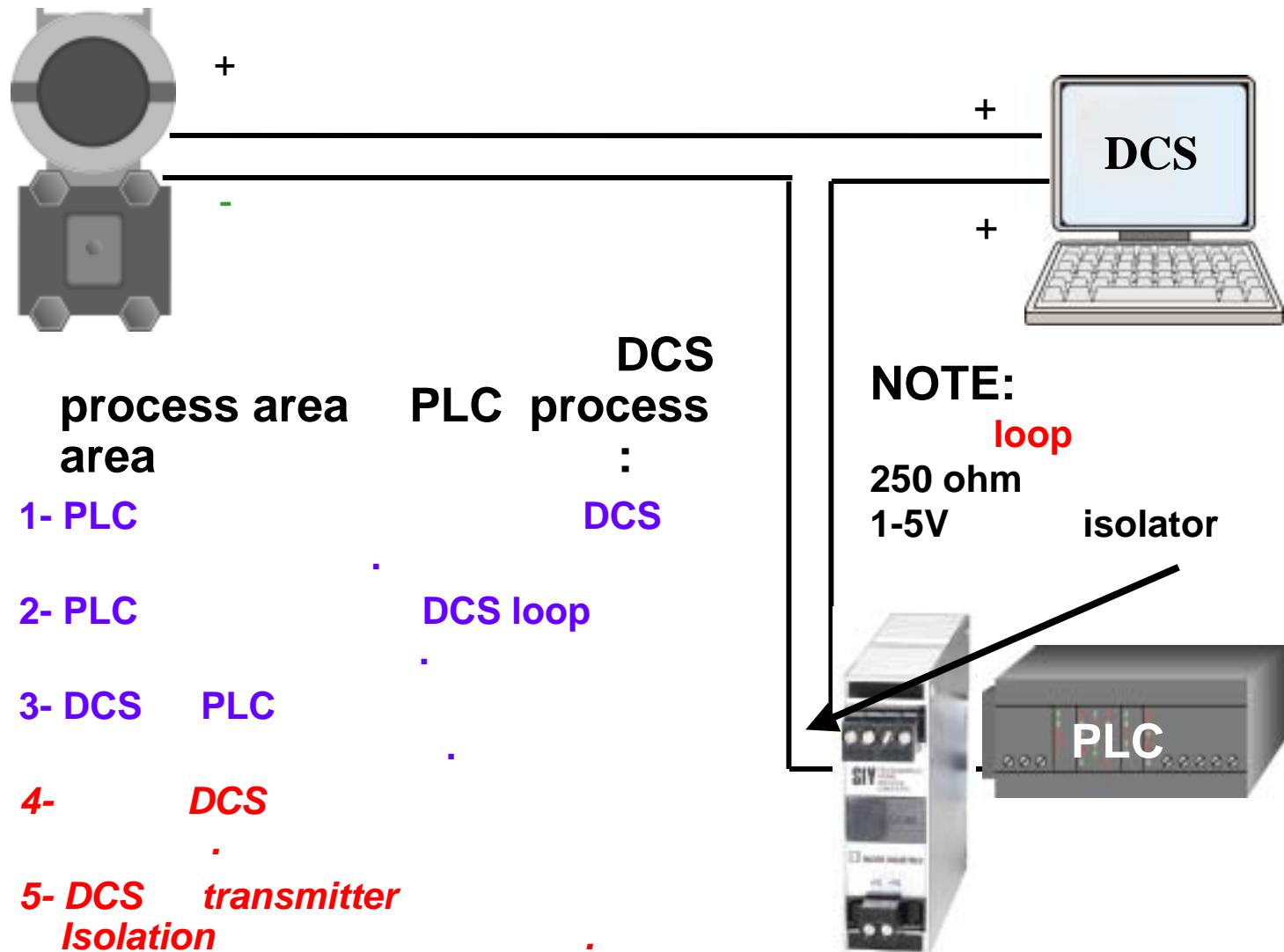
RFI

Temp

Catalog



# Area Isolation:



Alarms



Certs

HART

I/O

Isolators

Power

Pneumatic

RFI

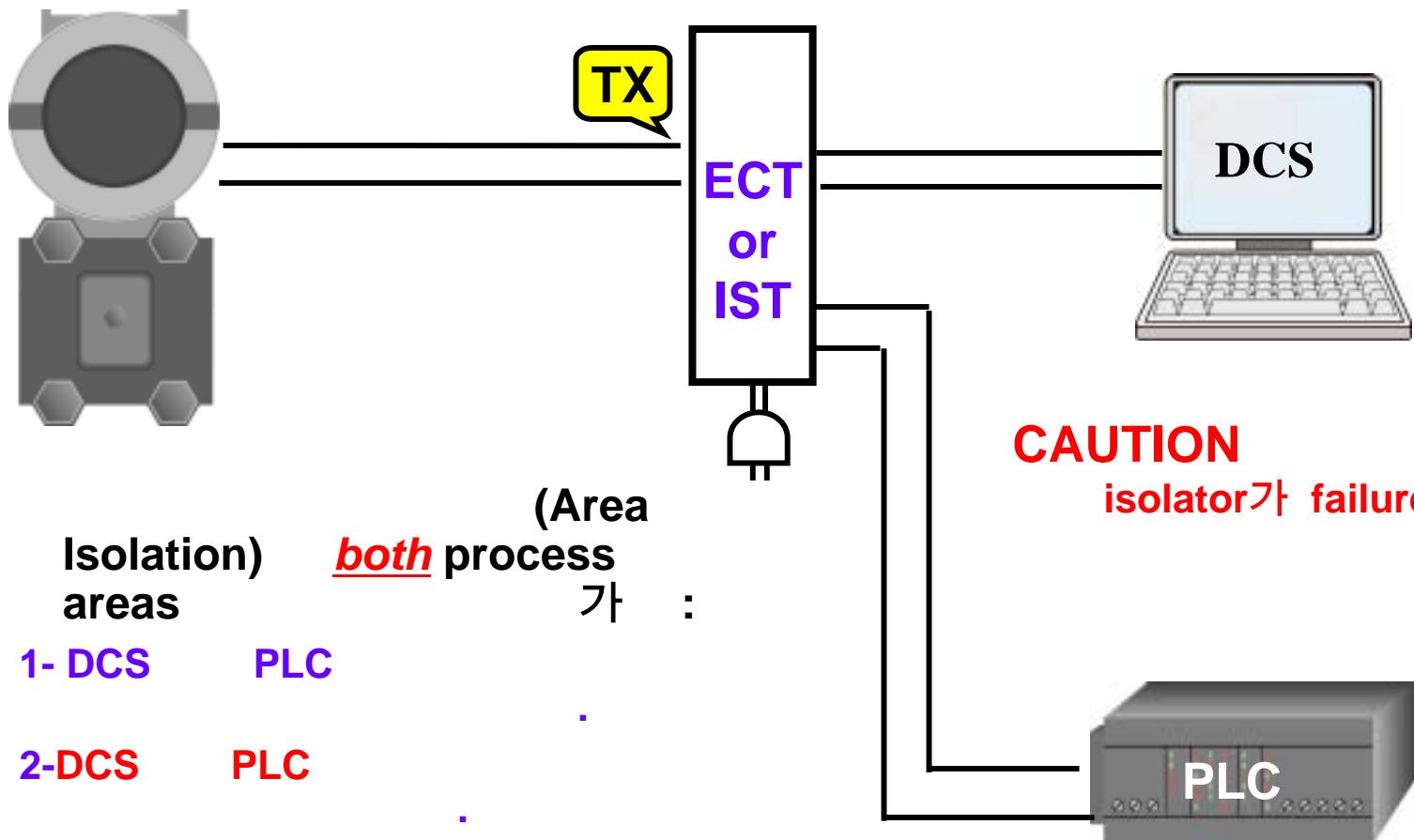
Temp

Catalog



## (Splitter)

....



Alarms



Certs

HART

I/O

Isolators

Power

Pneumatic

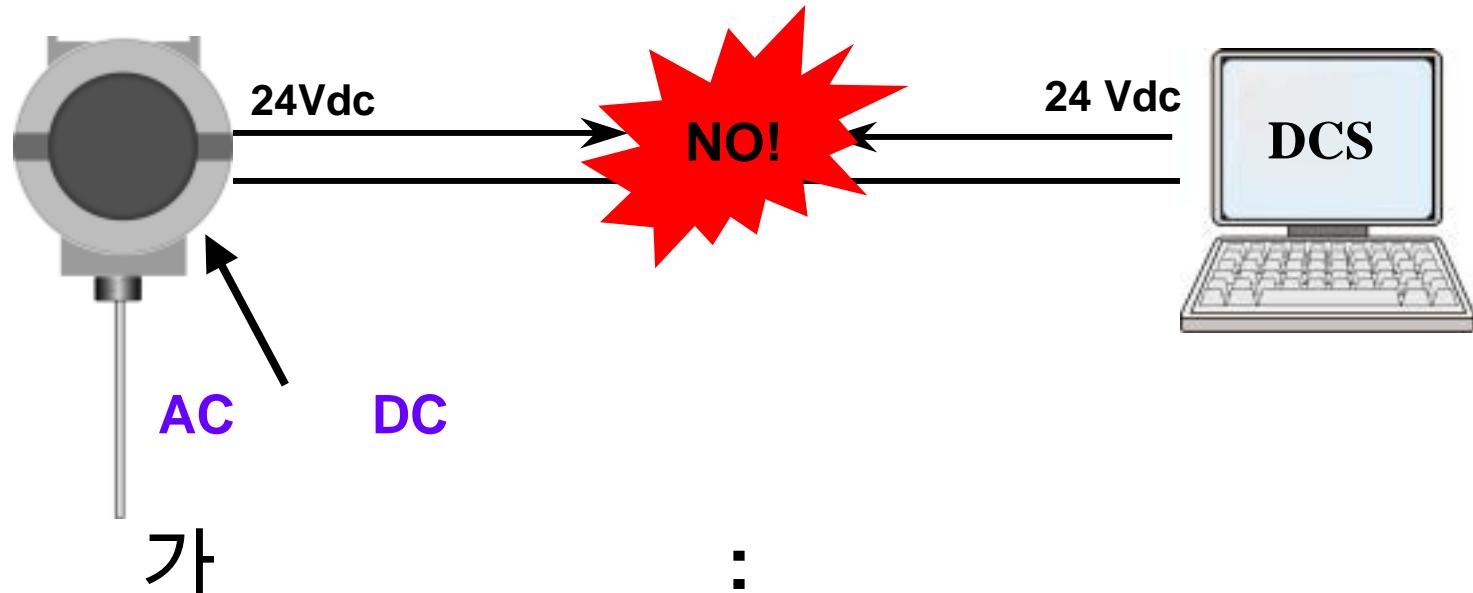
RFI

Temp

Catalog



## (Bucking Power Supplies).



- Magmeters, pH transmitters
  - 4-
- Moore Products DCS (Older systems)
- Honeywell TDC (Older TDC 2000 systems)
  - DCS

Alarms



Certs

HART

I/O

Isolators

Power

Pneumatic

RFI

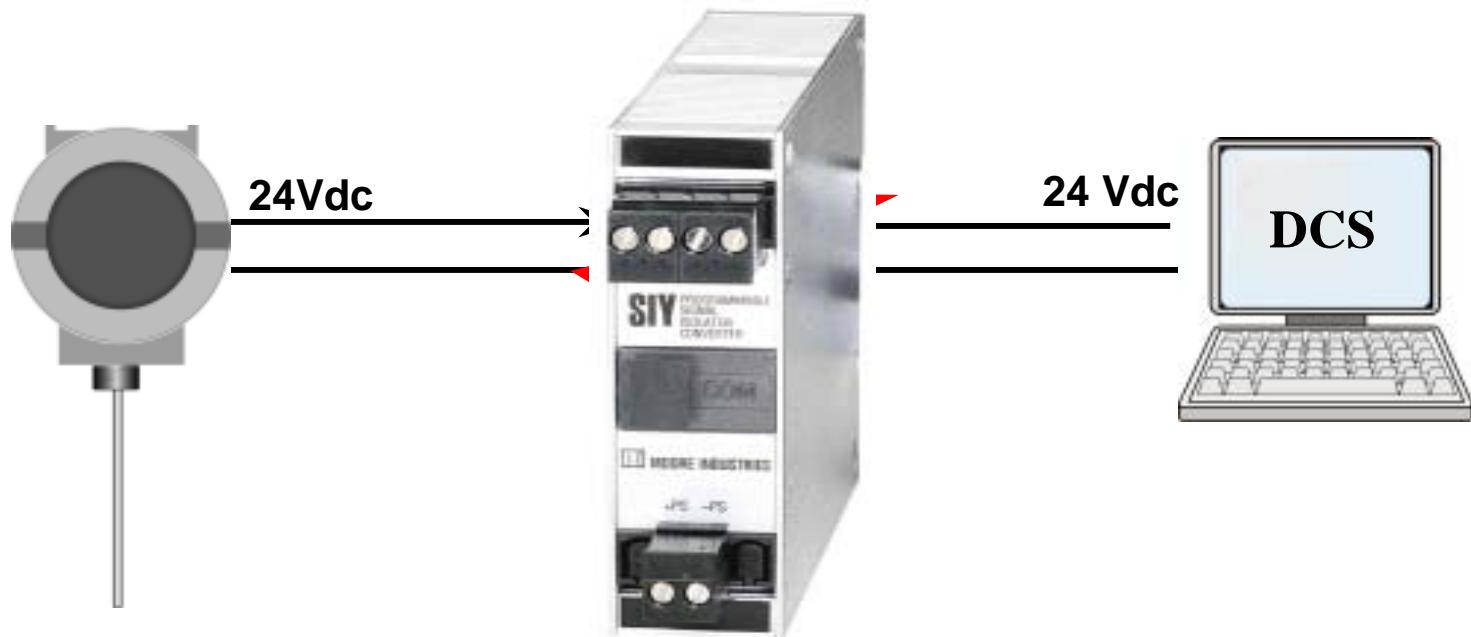
Temp

Catalog



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## (Bucking Power Supplies)



: Output Loop Powered Isolator

**SIY**

**ECT**

**SIX**

Alarms



Certs

HART

I/O

Isolators

Power

Pneumatic

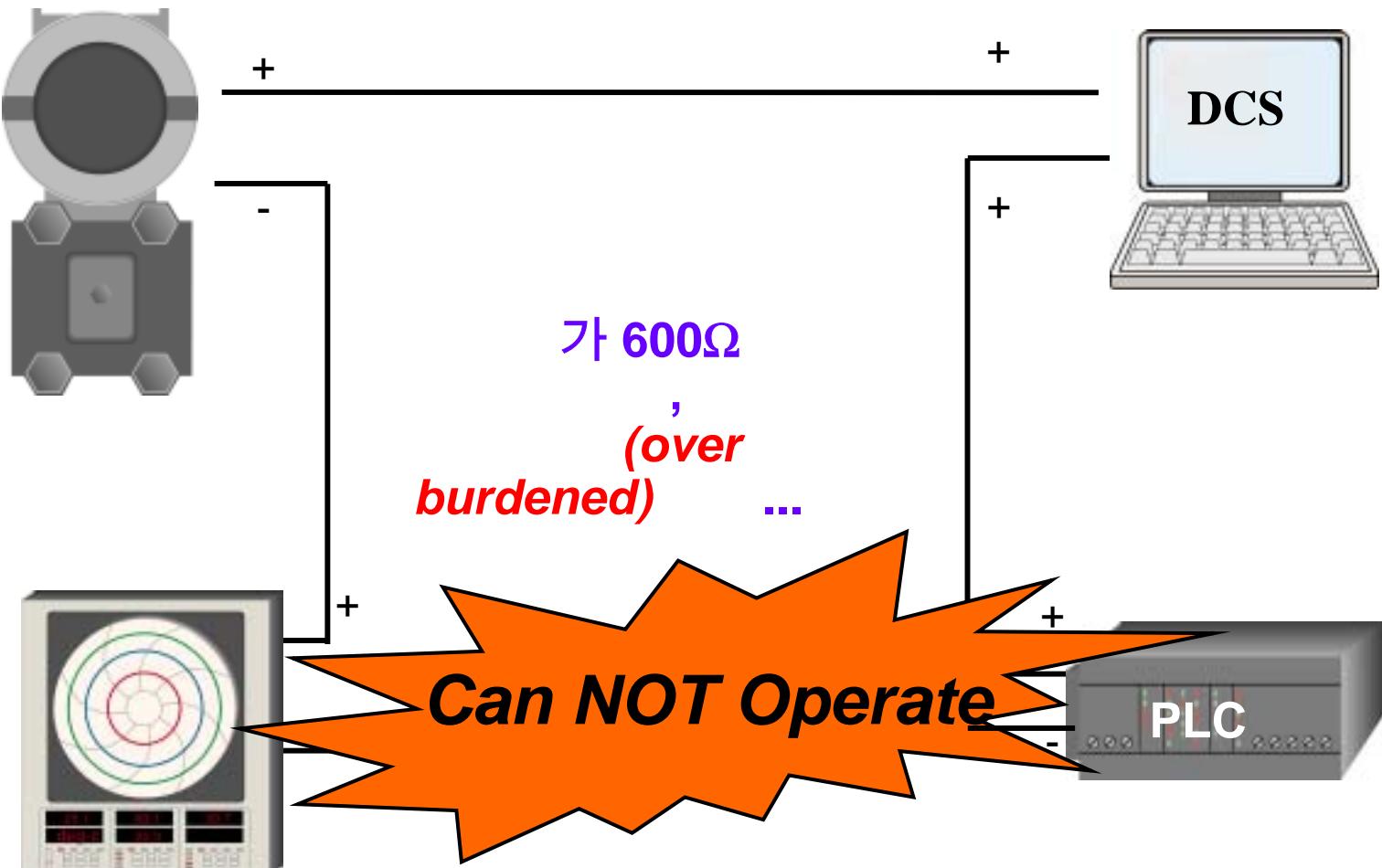
RFI

Temp

Catalog



## (Overloaded Loop)



Alarms



Certs

HART

I/O

Isolators

Power

Pneumatic

RFI

Temp

Catalog

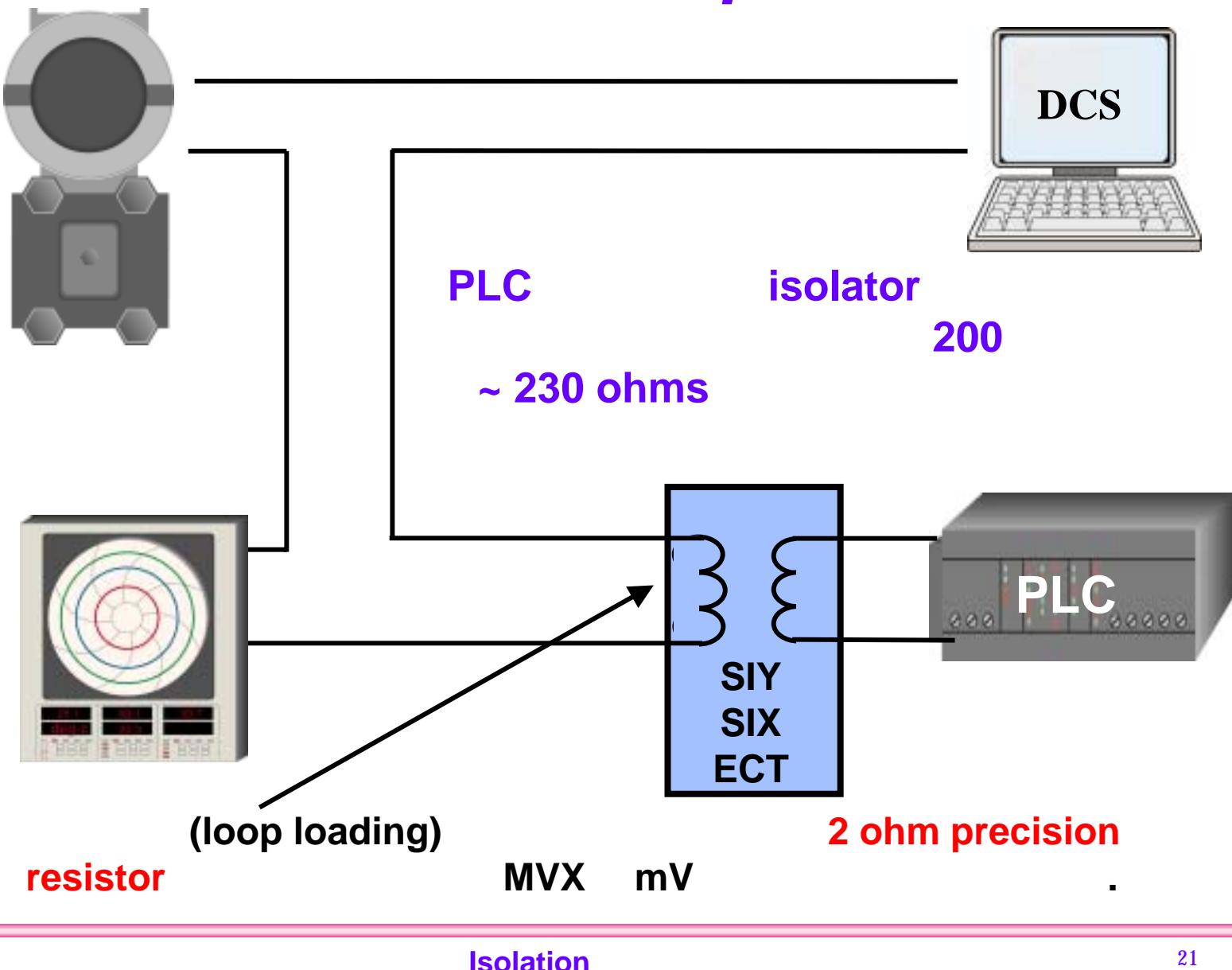


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# 1

# Overburdened Loop:



Alarms



Certs

HART

I/O

Isolators

Power

Pneumatic

RFI

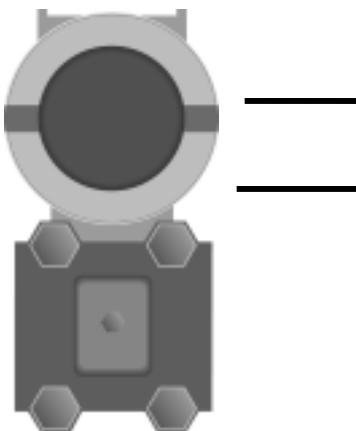
Temp

Catalog



# Overburdened Loop:

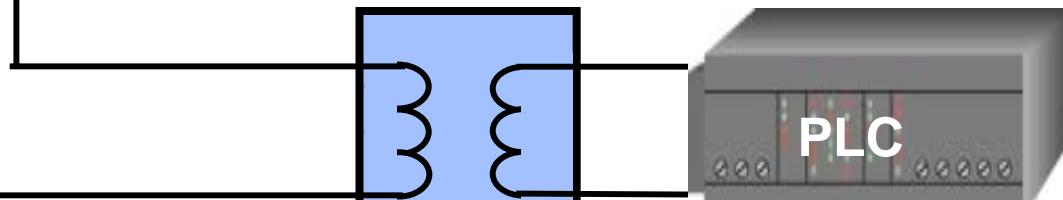
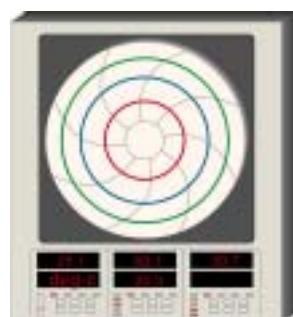
#2



PLC가

isolator

200 ~ 225 ohms



FCT  
ECT



Alarms



Certs

HART

I/O

Isolators

Power

Pneumatic

RFI

Temp

Catalog



# Isolator

3

....

:

- 4-
  - (ac dc)  
**FCT, IST, ECT, & HIT**
- 2-
  - Output loop powered (OLP)  
**SIY, SIX, ECT, ACX, & HIX**
- 2-
  - Input loop powered (ILP / Self-powered)  
**SCX & ECT**

Alarms



Certs

HART

I/O

Isolators

Power

Pneumatic

RFI

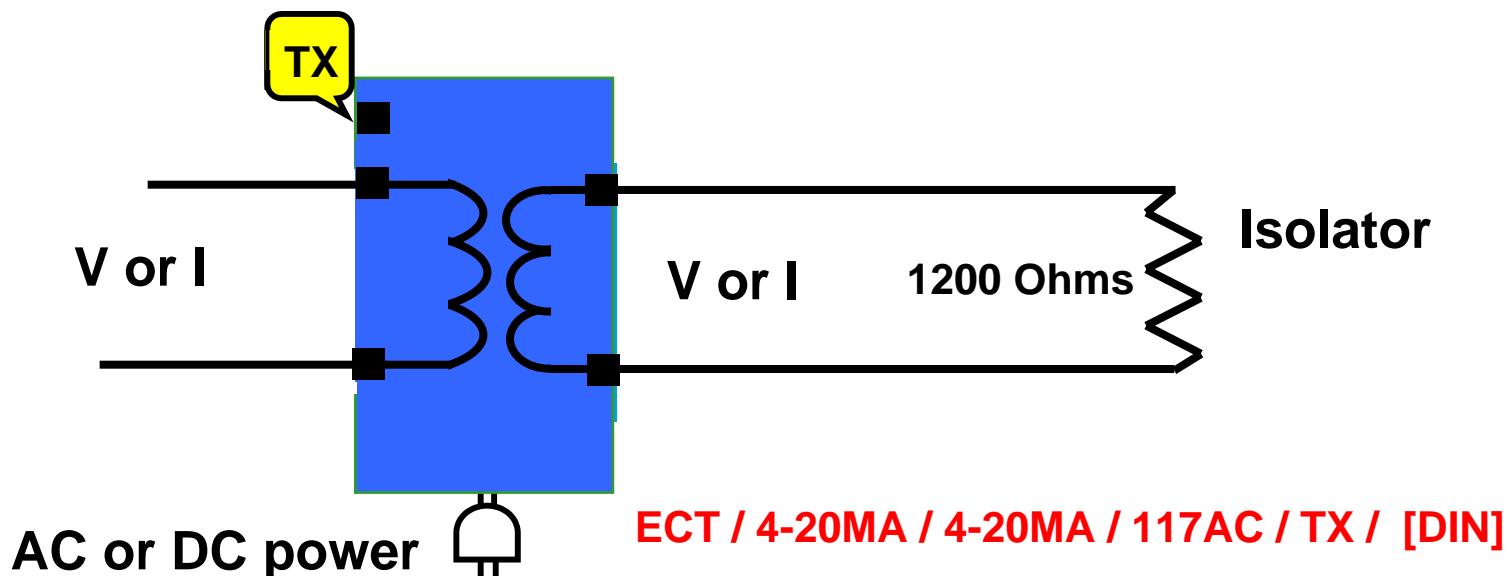
Temp

Catalog



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# ECT (Isolator, Converter, Splitter)....



- 1,500 Vac Isolation
- TX (input loop 24V )
- ac
- Dual CH. (Splitting)
- up to 1200 Ohms

Alarms



Certs

HART

I/O

Isolators

Power

Pneumatic

RFI

Temp

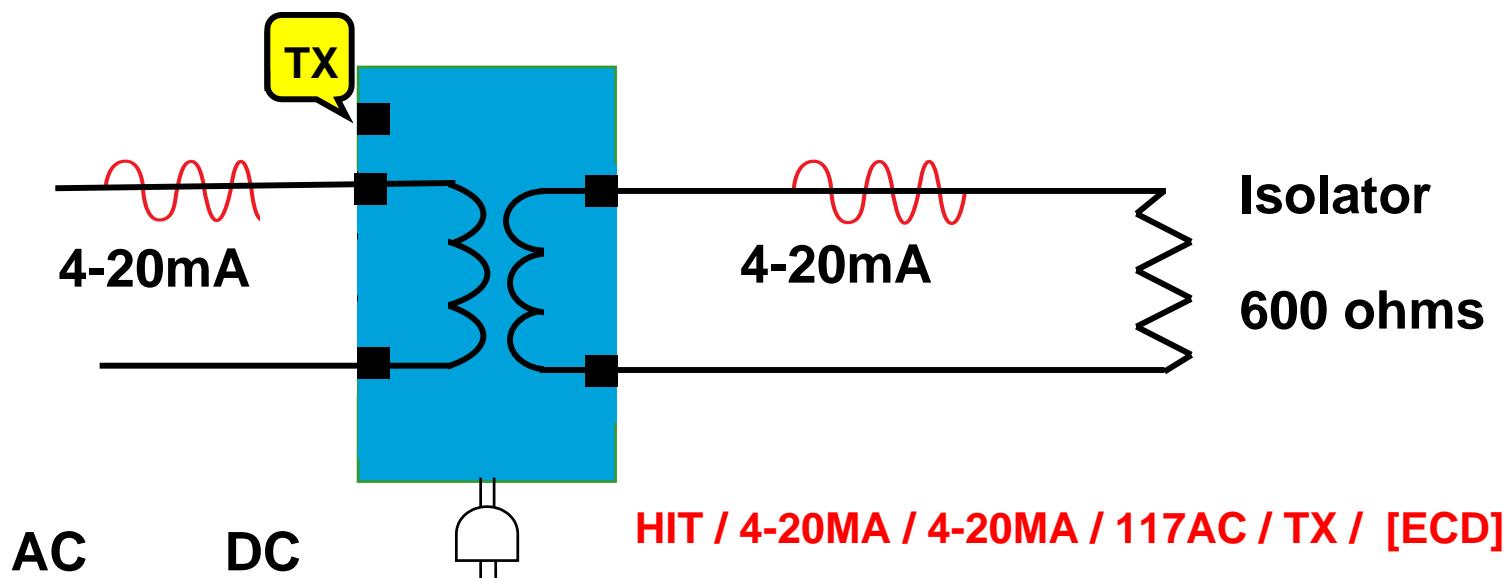
Catalog



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## 4- HIT HART Isolator....



- 1,500 Vac Isolation
- TX (input loop 24V )
- HART
- up to 600 Ohms

Alarms



Certs

HART

I/O

Isolators

Power

Pneumatic

RFI

Temp

Catalog



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4 -

....

**ECT :**

**FCT**

:

(to 30 Vpm)

**IST**

:

(IST sink )

(to 30 Vpm)

- RFI 가
- RFI 가
- IST 가
- IST 가

**• IST ECT**  
**Dual Output      Dual Channel**

Alarms



Certs

HART

I/O

Isolators

Power

Pneumatic

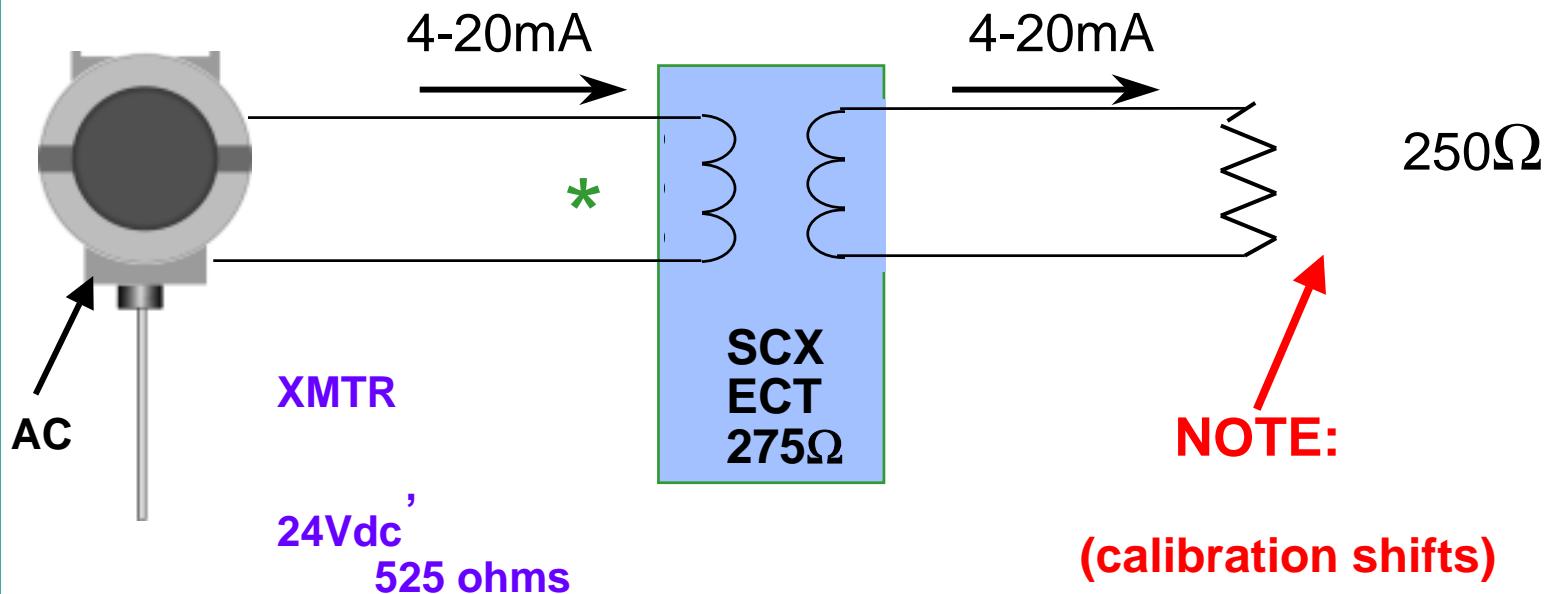
RFI

Temp

Catalog



# Input Loop Powered Isolators....



## \* ILP Isolators

4가지

1-

250Ω

2-

( fixed )

3-

( dry : no voltage )

4- XMTR

Alarms



Certs

HART

I/O

Isolators

Power

Pneumatic

RFI

Temp

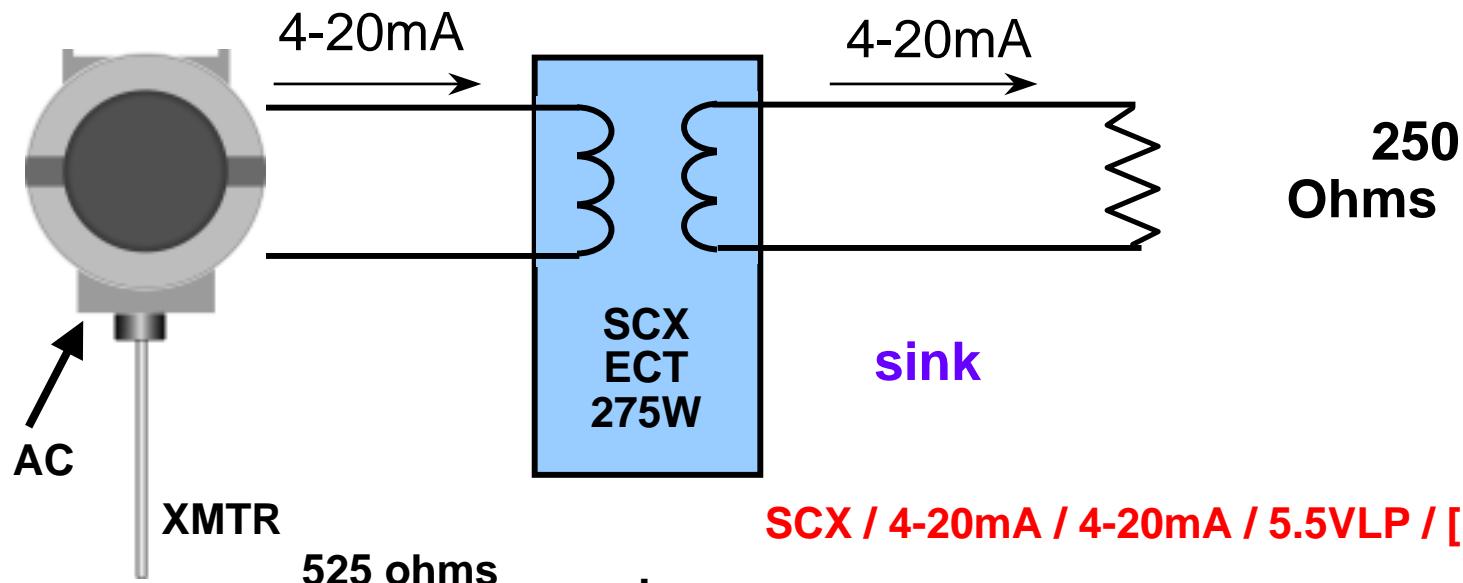
Catalog



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# Input Loop Powered Isolators....



## SCX

Housing: DIN or HP

DIN: AI      Plastic case

RFI: 50 V/m

## ECT

Housing: DIN

DIN: AI      Plastic case

RFI: 10 V/m

Alarms



Certs

HART

I/O

Isolators

Power

Pneumatic

RFI

Temp

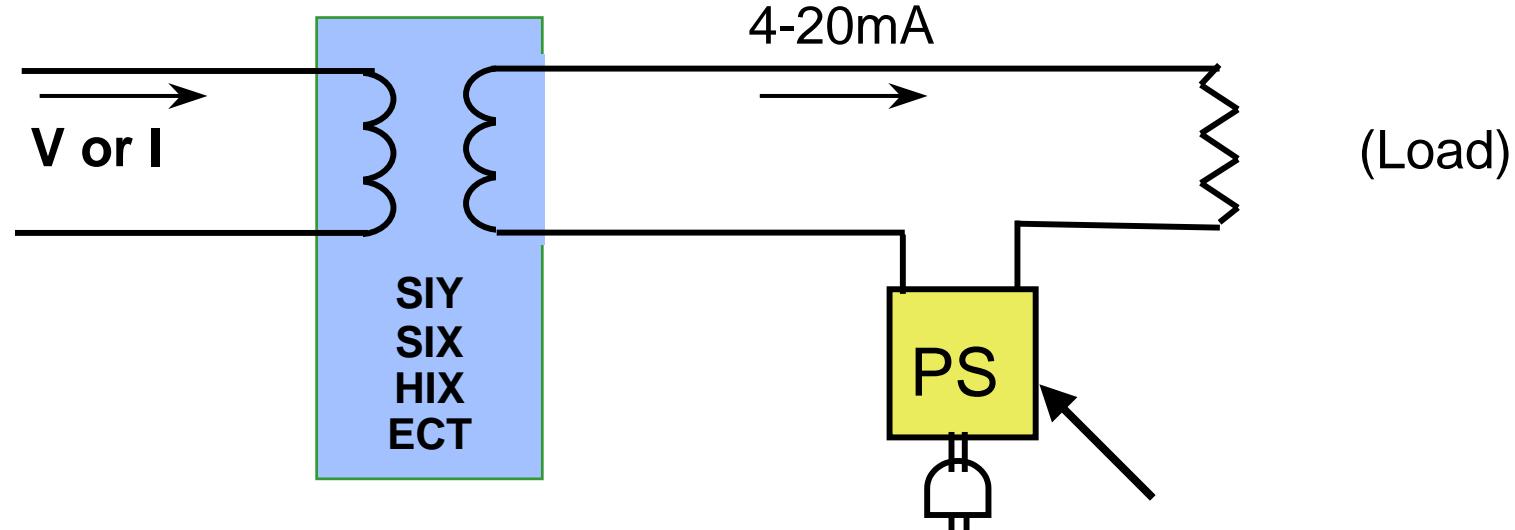
Catalog



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# Output Loop Powered Isolators....



- SIY      Software
- HIX      HART
- (PS)
- PLC
- DCS ,
- - loop powered
- 가
- PS = 24V,
- OLP Isolators      (Load) = 600 Ohms
- 2              transmitters

## Alarms



## Certs

HART

I/O

## Isolators

## Power

## Pneumatic

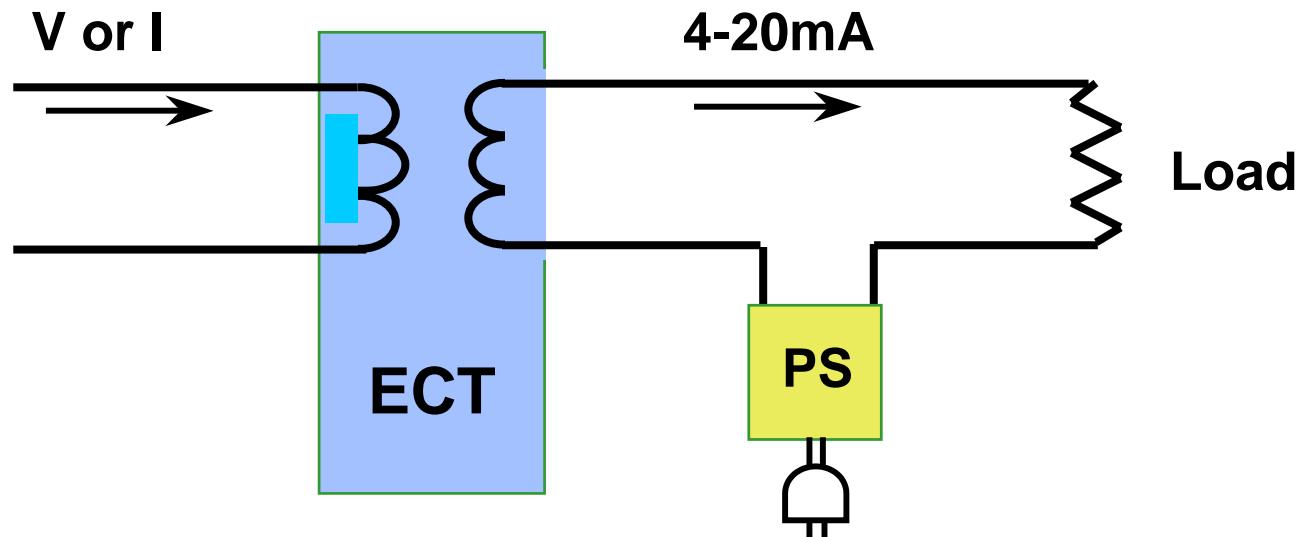
RFI

# Temp

## Catalog



# ***OLP Isolator***      ***ECT...***



**ECT / 0-10V / 4-20mA / 12-42DC / [ECD]**

- impedance = 4-20mA 25Ω
  - RFI Rejection 10 Vpm
  - TX
  - AC 가
  - Plastic Aluminum housing (

## Alarms



# Certs

HART

I/O

## Isolators

# Power

# Pneumatic

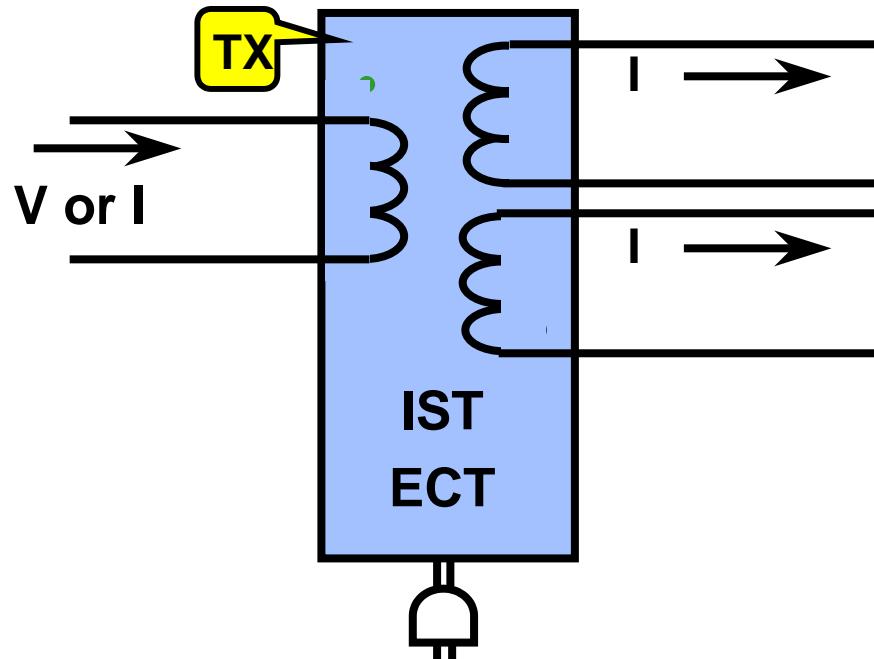
RFI

# Temp

## Catalog



# (Splitters)



Alarms



Certs

HART

I/O

Isolators

Power

Pneumatic

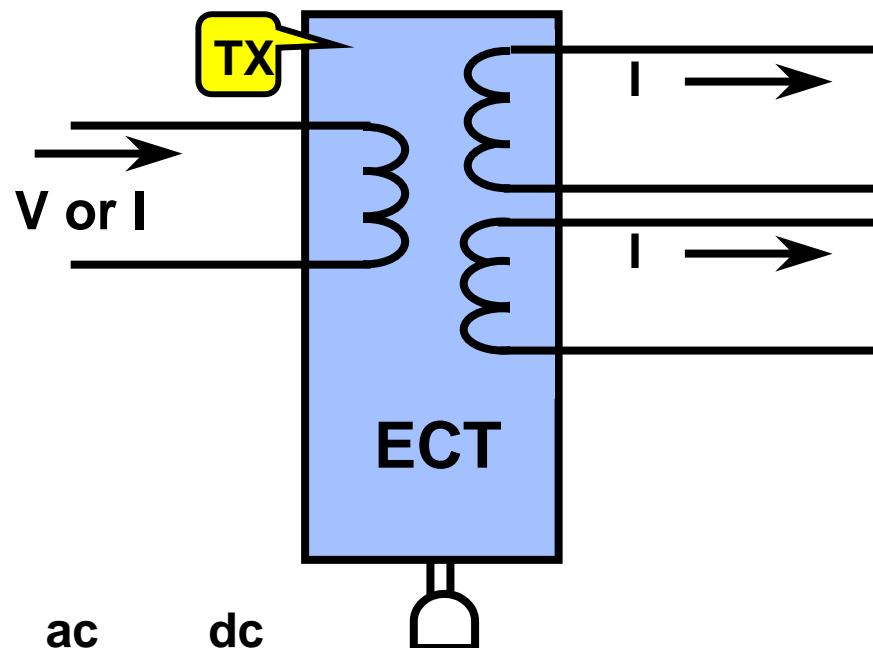
RFI

Temp

Catalog



# ECT Splitter....



ECT / 0-5AAC / 2X4-20mA / 24DC / [ECD]

- : 1200Ω      drive 가 10 Vpm
- RFI rejection      Aluminum DIN
- ABS plastic

Alarms



Certs

HART

I/O

Isolators

Power

Pneumatic

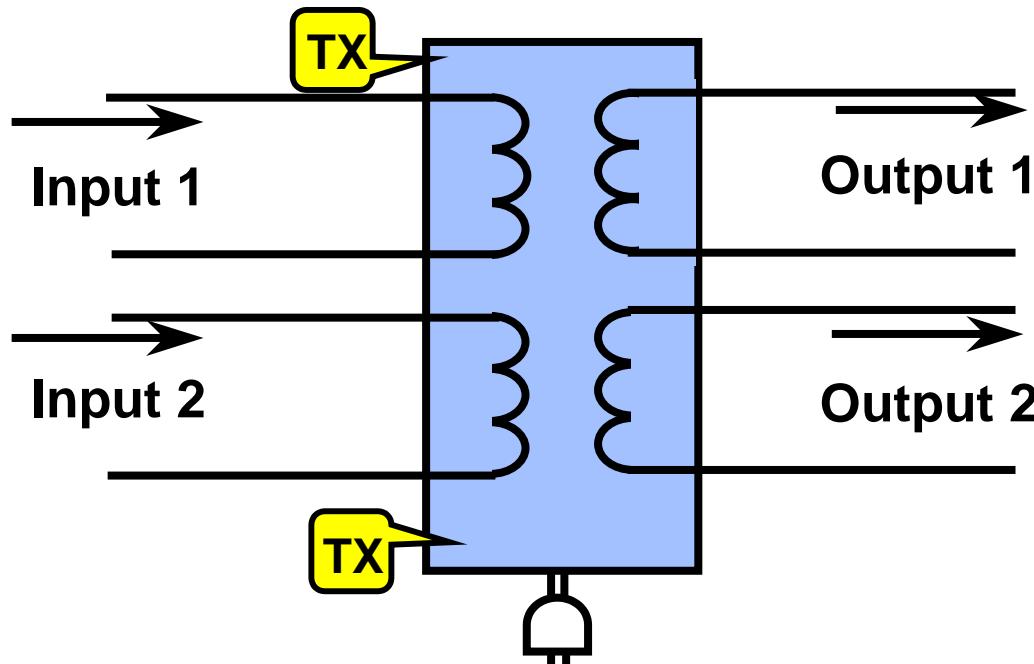
RFI

Temp

Catalog



# ECT Dual Isolators....



ECT / 2X4-20mA / 2X4-20mA / 117AC / -TX [DIN]

- Dual TX 2 가
- AC DC , 가
- RFI Protection (housings )

Alarms



Certs

HART

I/O

Isolators

Power

Pneumatic

RFI

Temp

Catalog

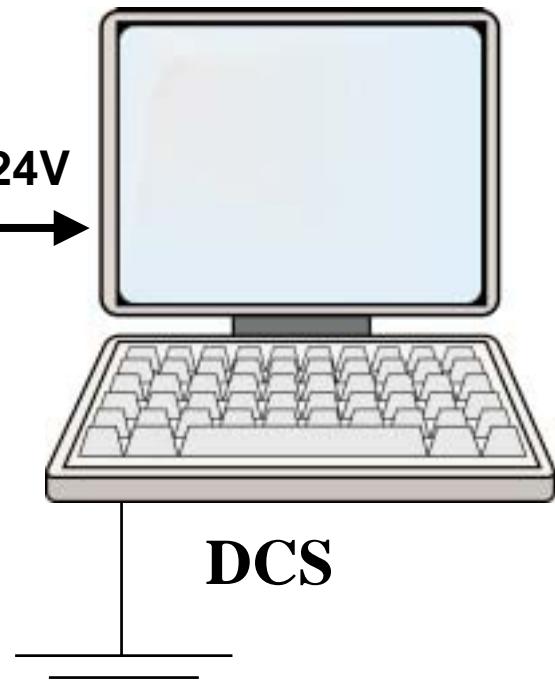


# “Pass-thru”

ECT

(Problem)

- 24V



- 가

Isolator

...

Alarms



Certs

HART

I/O

Isolators

Power

Pneumatic

RFI

Temp

Catalog



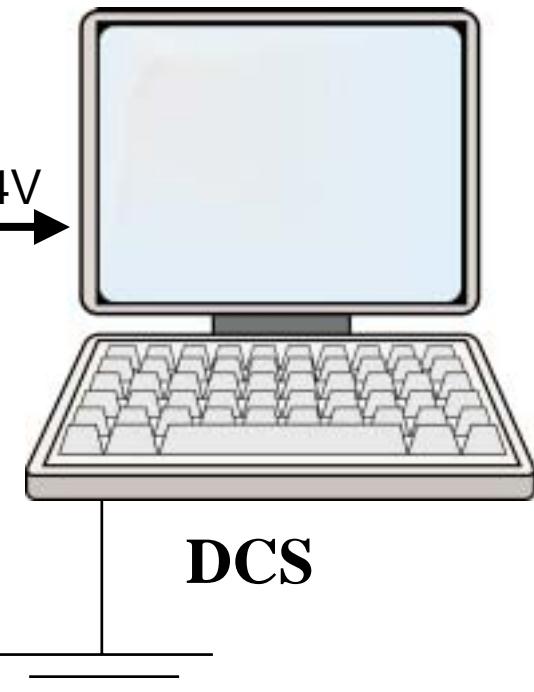
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## “Pass-thru” ECT



• 24V



- output loop  
powered isolator 가  
**RCVR**

**XMTR**

...

가

!

Bummer !

Alarms



?

Certs

HART

I/O

Isolators

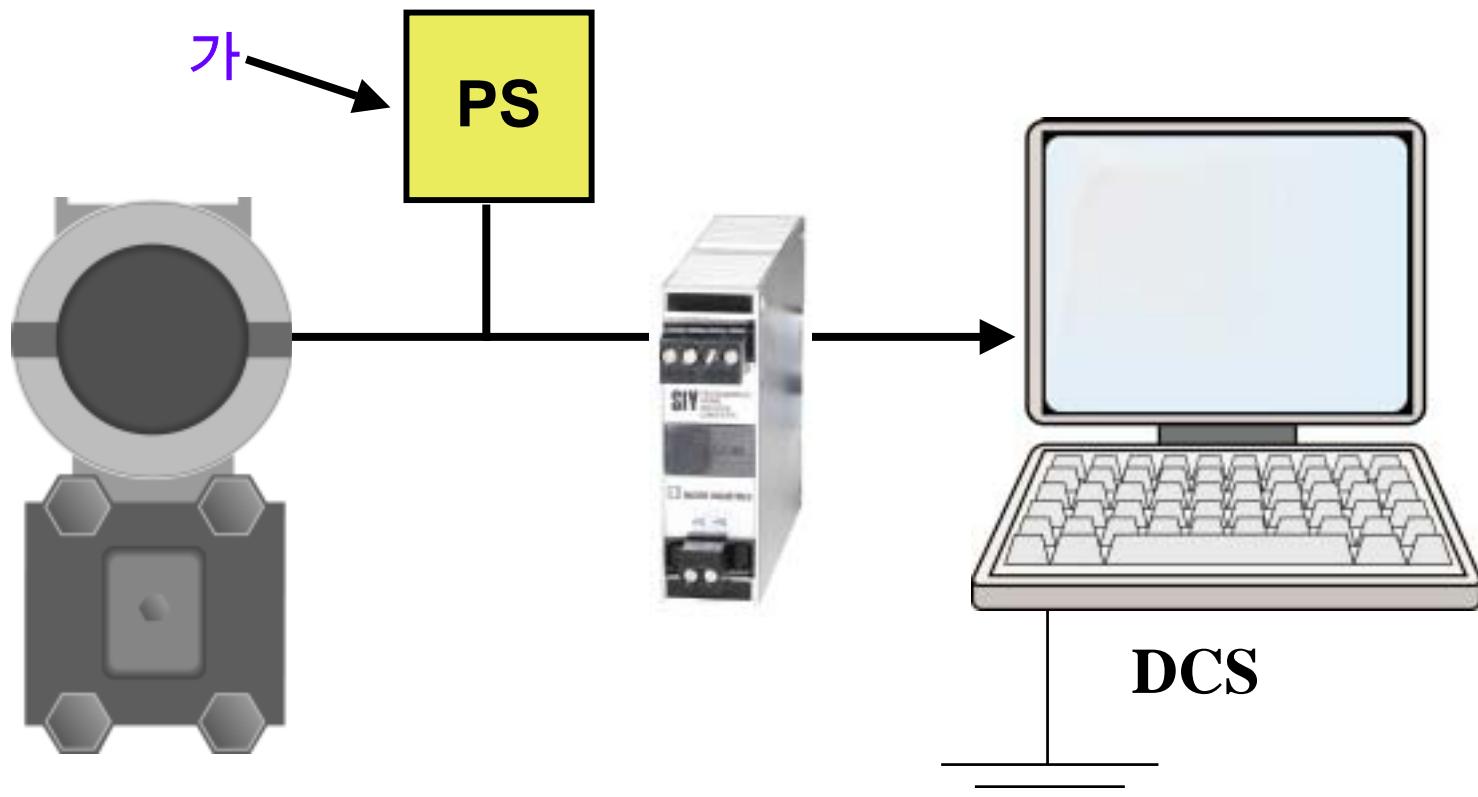
Power

Pneumatic

RFI

Temp

Catalog



**PS + Mounting + Wiring + Isolator + Drawing changes  
= HIGH COST**

Alarms



Certs

HART

I/O

Isolators

Power

Pneumatic

RFI

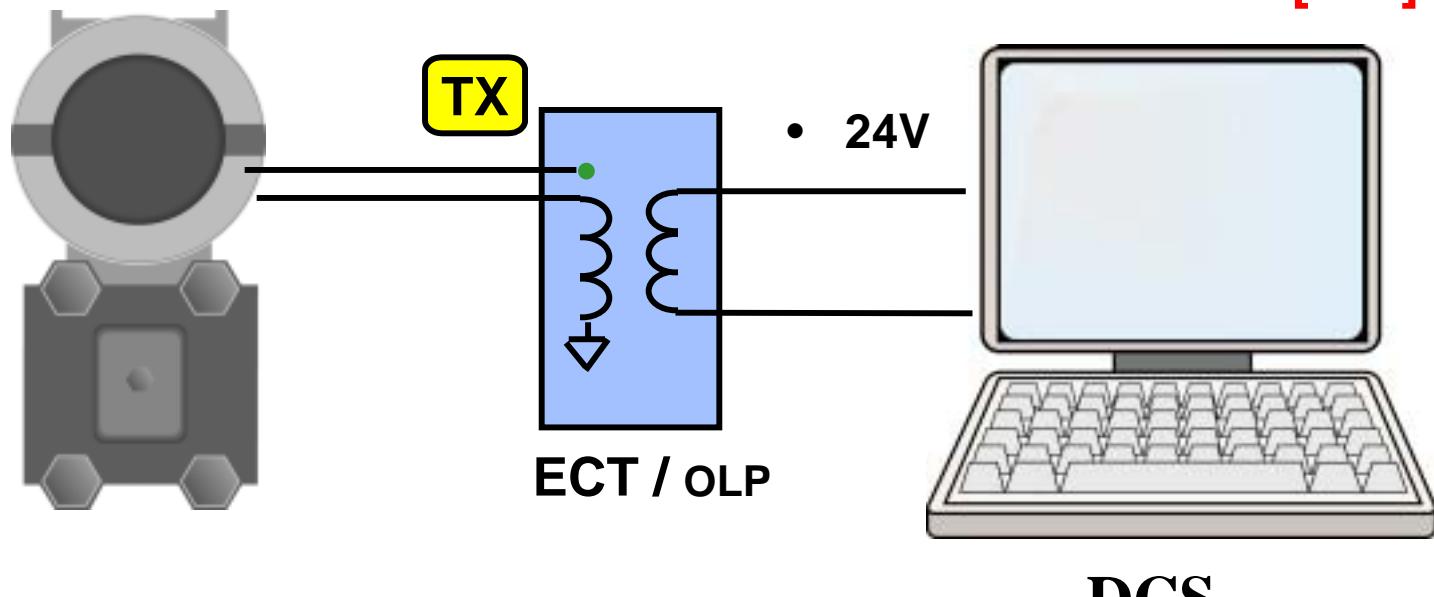
Temp

Catalog



## ECT "Pass-thru" Power

ECT / 4-20mA / 4-20mA / 24-42DC [DIN]



- TX (4-20mA TX vs. 4- 20mA )  
**(Cost Effective Solution)**

Alarms



Certs

HART

I/O

Isolators

Power

Pneumatic

RFI

Temp

Catalog



- **HART Loop Monitors**  
**SPA-HART**

??

.....



Alarms



Certs

HART

I/O

Isolators

Power

Pneumatic

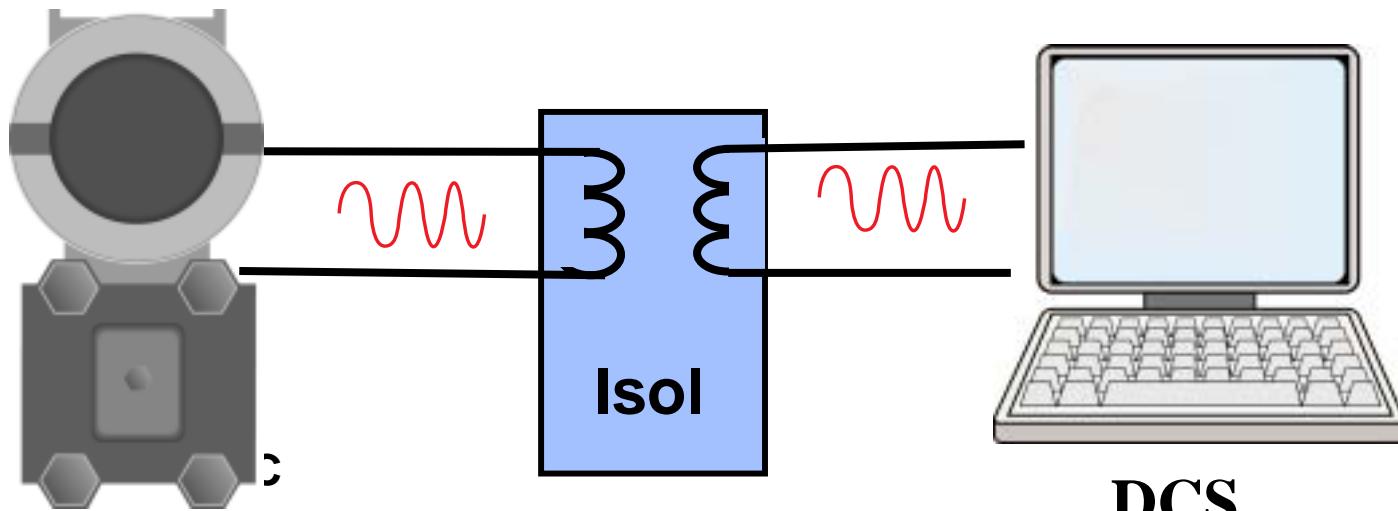
RFI

Temp

Catalog



# HART Isolators



DCS

A HART Isolator  
**HART**  
isolate  
가 .

isolator

**PLUS**

**HART HHC**

*modem adapter*  
가 .

Alarms



Certs

HART

I/O

Isolators

Power

Pneumatic

RFI

Temp

Catalog



# HART Isolators

...

- “HART compatible isolators”  
• , transmitters  
• 4-20mA  
• Isolation , HART transmitters  
• isolated ”

가

?

Alarms



Certs

HART

I/O

Isolators

Power

Pneumatic

RFI

Temp

Catalog



## **HART Isolator**

가 .

- HART

**Ground loops  
(Overburdened Loops)**

- (Area Isolation)

- HART

**(Bucking power supplies)**

- HART upgrade ,

isolators

HART

upgrade

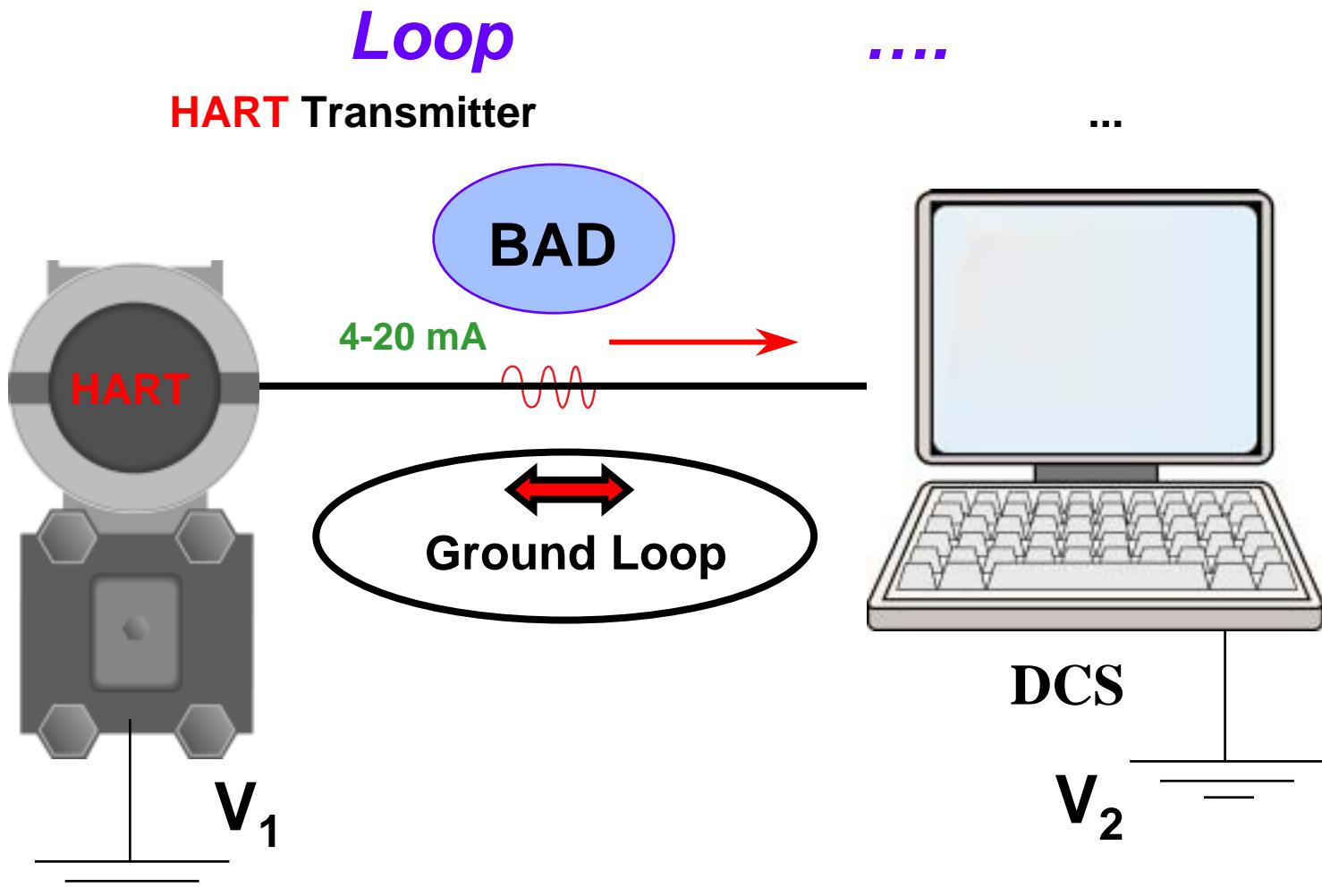
HIT

upgrade

HHC's

modem adapters

가

[Alarms](#)[Certs](#)[HART](#)[I/O](#)[Isolators](#)[Power](#)[Pneumatic](#)[RFI](#)[Temp](#)[Catalog](#)

**4-20mA ± Ground Loop**

Alarms



Certs

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I/O

Isolators

Power

Pneumatic

RFI

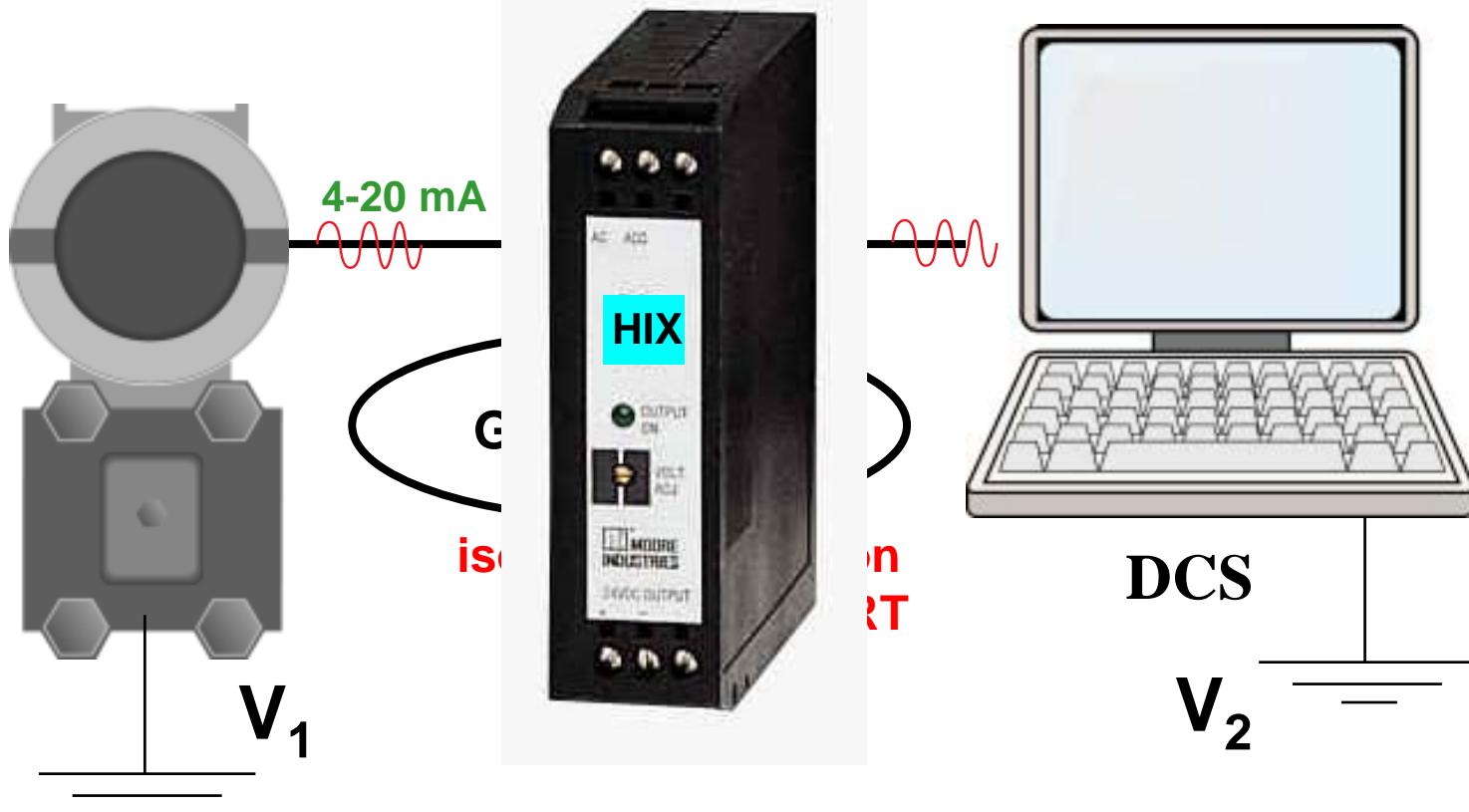
Temp

Catalog



가

.....



HIX full isolation

HART communication  
가

Alarms



Certs

HART

I/O

Isolators

Power

Pneumatic

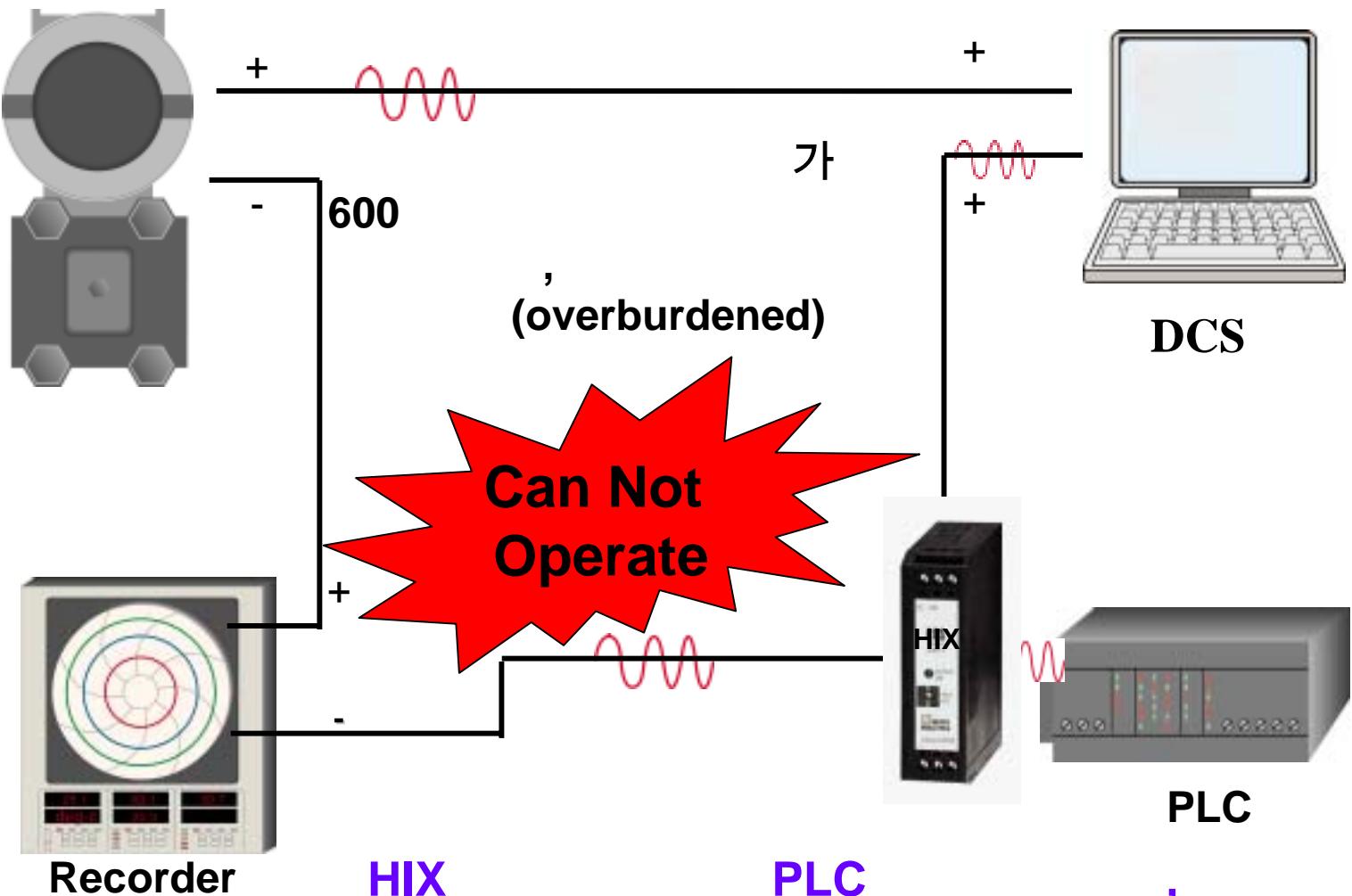
RFI

Temp

Catalog



## (Overburdened Loop) ....



Alarms



Certs

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I/O

Isolators

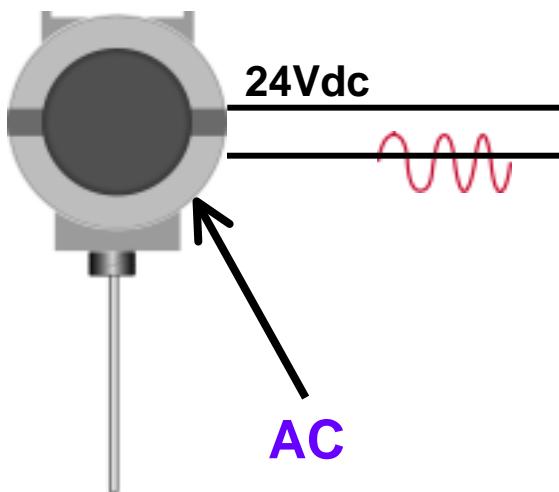
Power

Pneumatic

RFI

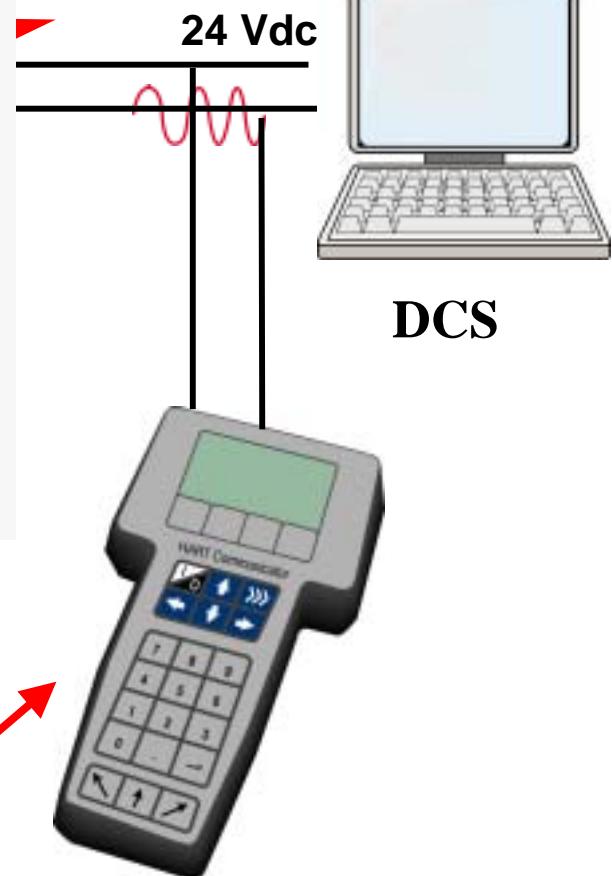
Temp

Catalog



## (Bucking Power)

가...



HIX

HART

가

Alarms



Certs

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Power

Pneumatic

RFI

Temp

Catalog



  
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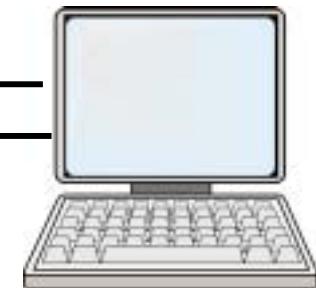
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# (Area Isolation)

....



isolator  
isolation  
... HART  
가

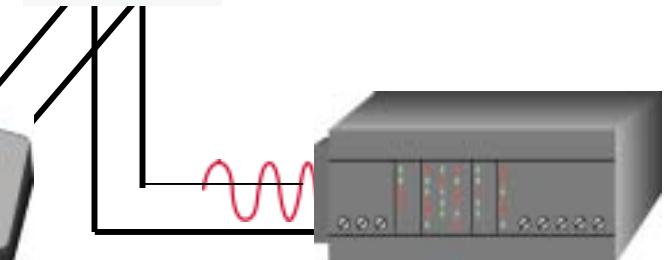


**DCS  
Primary  
Control  
System**

HIX

isolation

HART  
가



**PLC  
Secondary  
Control  
System**

Alarms



Certs

HART

I/O

Isolators

Power

Pneumatic

RFI

Temp

Catalog

