



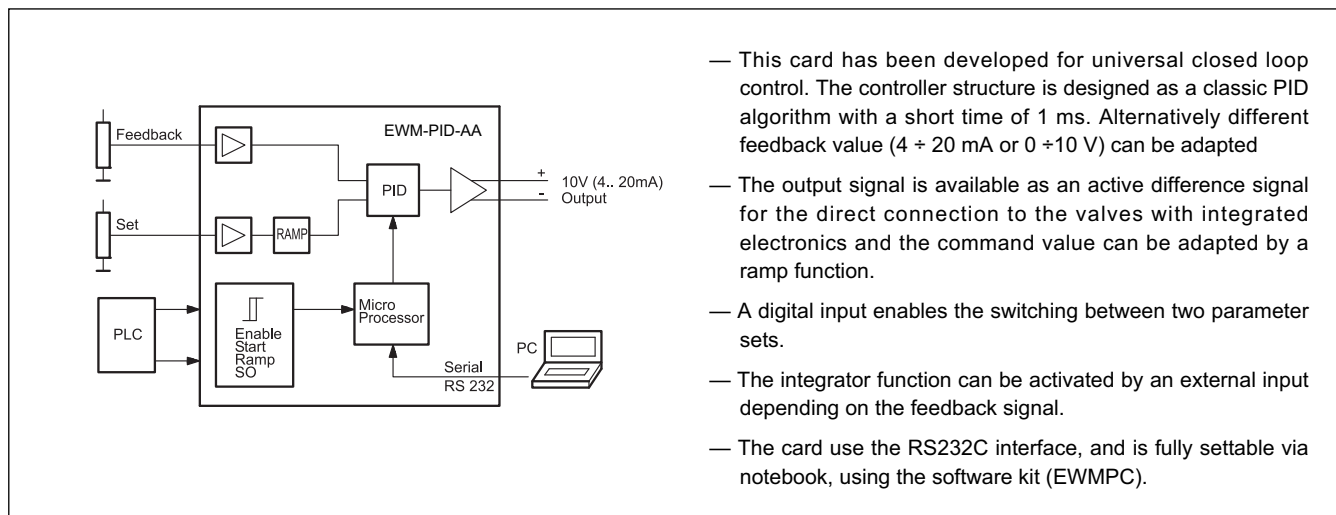
EWM-PID-AA

UNIVERSAL CONTROL CARD FOR CLOSED LOOP SYSTEMS

SERIES 10

**RAIL MOUNTING TYPE:
DIN EN 50022**

OPERATING PRINCIPLE

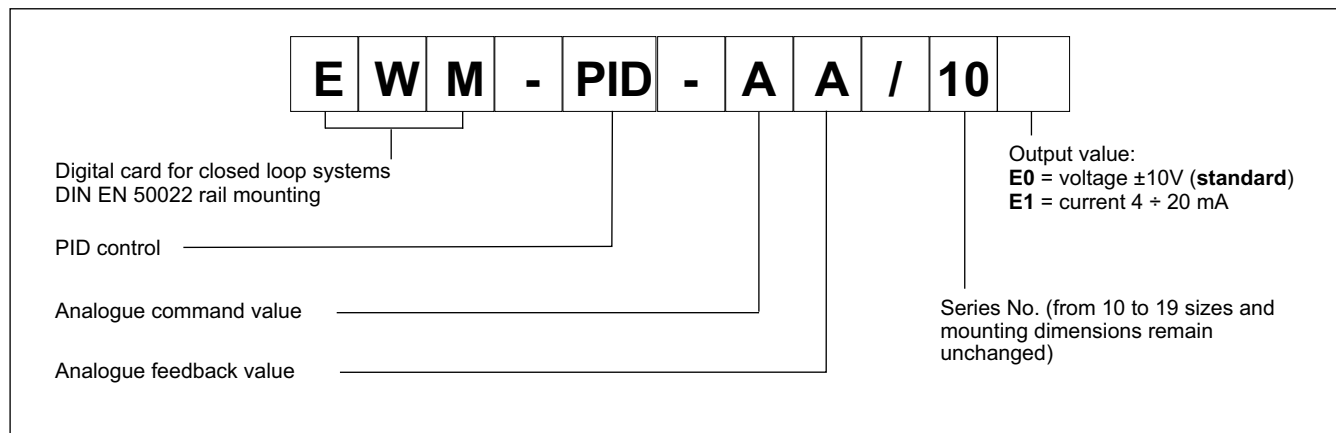


TECHNICAL CHARACTERISTICS

Power supply	V DC	12 \div 30 ripple included external fuse 1,0 A
Current consumption	mA	100
Command value	V mA	0 \div 10 ($R_I = 33$ k Ω) 4 \div 20 ($R_I = 250$ Ω)
Feedback value	V mA	0 \div 10 ($R_I = 33$ k Ω) 4 \div 20 ($R_I = 250$ Ω)
Output value: - E0 version - E1 version	V mA	± 10 (max load 5 mA) 4 \div 20 (max load 390 Ω)
Interface		RS 232 C
Electromagnetic compatibility (EMC):		Emissions EN 61000-6-2:8/2002 Immunity EN 61000-6-3:8/2005
Housing material		thermoplastic polyamide PA6.6 combustibility class V0 (UL94)
Housing dimensions	mm	120 (d) x 99(h) x 23(w)
Connector		4x4 poles screw terminals - PE direct via DIN rail
Operating temperature range	$^{\circ}$ C	-20 / +60
Protection degree		IP 20



1 - IDENTIFICATION CODE



2 - FUNCTIONAL SPECIFICATIONS

2.1 - Power supply

This card is designed for 12 to 30 VDC (typical 24 V) of a power supply. This power supply must correspond to the actual EMC standards.

All inductivities at the same power supply (relays, valves) must be provided with an over voltage protection (varistors, free-wheel diodes).

It is recommended to use a regulated power supply (linear or switching mode) for the card supply and for the sensors.

2.2 - Electrical protections

All input and output are protected against overvoltage and have filters.

2.3 - Digital input

The card accepts digital input. The digital input must have a voltage from 12 to 24 V with current $< 0,1A$. As common potential 0V (PIN 4) is used. Low level $< 4V$, high level $> 12V$. (See the block diagram at paragraph 8 for the electric connections.)

2.4 - Command input

The card accepts an analogue command value, The pin are 13 and 11. Voltage $0 \div 10$ V (R_i 33 k Ω); current $4 \div 20$ mA (R_i 250 Ω)

2.5 - Input feedback values

The card accepts analogue feedback input. The feedback value must be $0 \div 10$ V (R_i 33 k Ω) or $4 \div 20$ mA (R_i 250 Ω). The pin are 14 and 11.

2.6 - Output values

The card is designed for two type of output values, voltage $\pm 10V$ (E0 version, pin 15 and pin 16) or current $4 \div 20$ mA (E1 version, pin 15 and pin 12); standard output value is E0 type.

2.7 - Digital Output

Two digital output are available, INPOS and READY, and their signals are displayed from the leds.

3 - LED FUNCTIONS

There are two leds on the card: .

GREEN: Shows if the card is ready.

ON - The card is supplied

OFF - No power supply or ENABLE is inactive

FLASHING - Failure detected (internal or $4..20$ mA) only if the SENS parameter is ON

YELLOW: Is the signal of the control error monitoring.

ON - No control error

OFF - Error detected, depending of a parameter error.

4 - ADJUSTMENTS

On the EWM card family, the adjustment setting is possible only via software. Connecting the card to the PC, the software automatically recognises the card model, and shows a table (see example on next page) with all the available parameters, with their commands, the default setting, the measuring unit and an explanation of the command and its uses.

The parameters changes depending on the card model, and they are fully described in the *Overhaul manual*.

5 - INSTALLATION

The card is designed for rail mounting type DIN EN 50022.

The wiring connections are on the terminal strip located on the bottom of the electronic control unit. It is recommended to use cable sections of 0.75 mm², up to 20 m length and of 1.00 mm² up to 40m length, for power supply. For further connections it is recommended to use cables with a screened sheath connected to earth only on the card side.

NOTE 1

To observe EMC requirements it is important that the control unit electrical connection is in strict compliance with the wiring diagram.

As a general rule, the valve and the electronic unit connection wires must be kept as far as possible from interference sources (e.g. power wires, electric motors, inverters and electrical switches).

In environments that are critical from the electromagnetic interference point of view, a complete protection of the connection wires can be requested.



6 - SOFTWARE KIT EWMPC/10 (code 3898401001)

The software kit includes a USB cable (2.70 mt lenght) to connect the card to a PC or notebook and the software.

During the identification all information are read out of the module and the table input will be automatically generated.

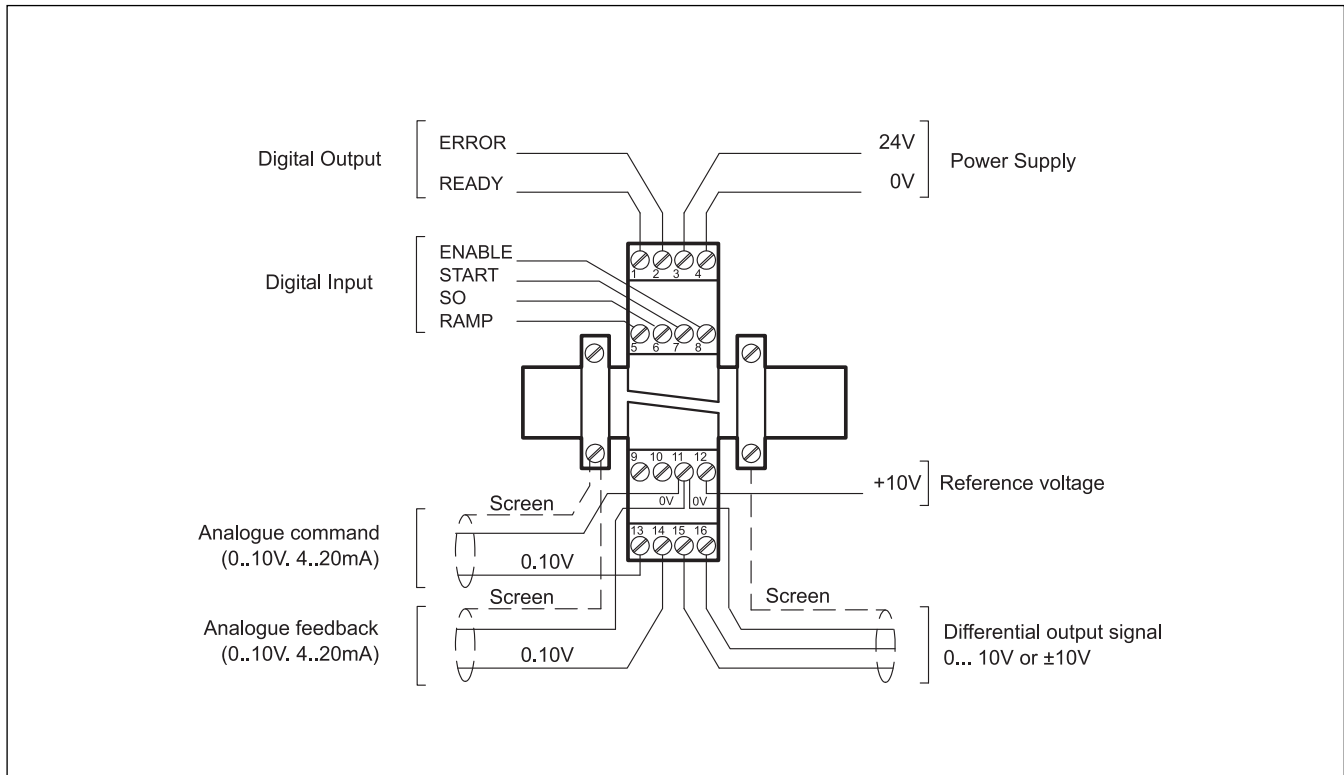
Some functions like baud rate setting, remote control mode, saving of process data for later evaluation, are used to speed up the installation procedure.

The software is compliant with Microsoft XP® operating systems.

EXAMPLE OF PARAMETERS TABLE

Commands	Parameter	Defaults	Units	Description
ain:i a b c x	i= W X a= -10000... 10000 b= -10000... 10000 c= -10000... 10000 x= V C	: 10000 : 10000 : 0 : V	- - 0,01% -	Analogue output selection. W and X for the inputs and V = voltage, C = current. With the parameters a , b and c the inputs can be scaled (output = a / b * (input - c)). Because of the programming of the x-value (x = C) the corresponding input will be switched over to current automatically.
a:i x	i= UP DOWN x= 2..60000	:UP 100 :DOWN 100	ms ms	Time in ms for ramp UP and DOWN .
lim:i x	i= I S N :I 0... 10000 :S 0... 10000 :N -10000... 0	2500 2500 0	0,01% 0,01% 0,01%	Integrator limitation / activation LIM:I, general limitation (2500 = ±25%) LIM:S, Integrator activation depending on the command value. LIM:S 2500 (25%) = the integrator is active if the actual pressure is higher than 25% of the command pressure. LIM:N, limitation of the negative output range.
c0:i x cl:i x	i= P I D T1 IC :P x= 0... 10000 :I x= 2... 2050 :D x= 0... 120 :T1 x= 0... 100 :SC x= 0... 10000	:P 50 :I 400 :D 0 :T1 1 :SC 5000	0,01 ms ms ms 0,01%	PID-compensator for pressure limitation: P -gain, 50 corresponded with a nominal gain of 0,5. I -gain, integrator time in ms, >2010 for deactivation. D -gain, T1 -time for damping of the D part. SC command signal scaling (direct control of the output).
min:i x	i= A B x= 0... 5000	:A 0 :B 0	0,01% 0,01%	Deadband compensation of positive overlapped proportional valves. Good adjustment will increase positioning accuracy.
max:i x	i= A B x= 5000... 10000	:A 10000 :B 10000	0,01% 0,01%	Maximum output range for adapting control range to maximum flow range.
trigger x	x= 0... 2000	200	0,01%	Point to activate the deadband compensation (min). Also useful for reduced sensitivity in position with control valves.
error x	x= 2... 2000	200	0,01%	Range for the error window (status output).
pol x	x= + -	+	-	For changing the output polarity. All A and B adjustments depend on the output polarity. The right polarity should be defined first.
sens x	x= on off	on	-	Activation of the sensor and internal failure monitoring.
pin5 x	x= ramp integ	ramp	-	Ramp or integrator control.
remote x	on off	off	-	Remote control function.
rc:s x	x= 0... 15	-	-	Emulation of the digital inputs.
rc:v x	x= 0... 10000	-	0.01%	Emulation of the analogue command signal
save	-	-	-	Storing the programmed parameter in E ² PROM.
loadback	-	-	-	Reloading the parameter from E ² PROM in working RAM
din	-	-	-	Status of the digital inputs.
w, x, xw, u,	-	-	-	Actual signals: command value, actual value, process data, control divergence and reference value.
default	-	-	-	Preset values will be set.

7 - WIRING DIAGRAM



DIGITAL INPUT AND OUTPUT

- PIN 1** READY output:
General operationality, ENABLE is active and there is no sensor error (by use of 4... 20 mA sensors). This output corresponds with the green LED.
- PIN 2** STATUS output:
Monitoring of the control error. Depending on the ERROR command, the status output will be deactivated, if the control difference is greater then the adjusted window.
- PIN 5** RAMP- input: (if command PIN5 = RAMP)
The ramp times for pressure up and down will be activated.
INTEG input (if command PIN5 = INTEG):
The integrator function is active, the ramps are always active.
- PIN 6** S0 input:
Switching over between parameter Set 0 and 1.
- PIN 7** START input:
The controller is active; the external analogue command value is taken over.
- PIN 8** ENABLE input:
This digital input signal initializes the application. The analogue output is active and the READY signal indicates that all components are working correctly. The system works in open loop (like a simple power amplifier).

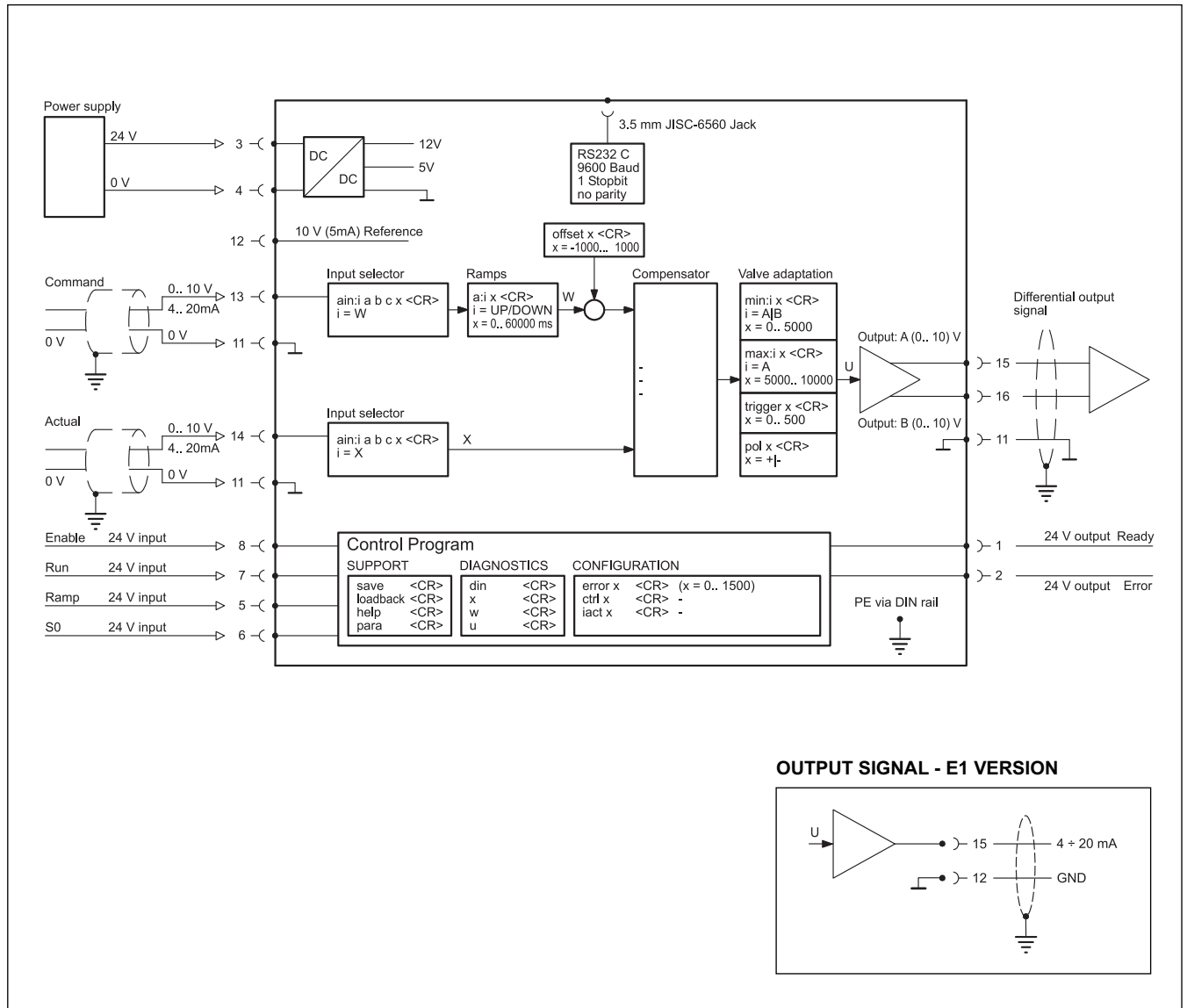
ANALOGUE INPUT

- PIN 13** Command value (W)
range 0 + 100% corresponds to 0 + 10V or 4 +20 mA
- PIN 14** Actual (feedback) value (X)
range 0 + 100% corresponds to 0 + 10V or 4 +20 mA

ANALOGUE OUTPUT

- PIN 15/16** Differential output (U) ± 100% corresponds to ± 10V differential voltage,
optionally (E1-version) current output ±100% corresponds to 4 + 20 mA (PIN 15 to PIN 12)
See command LIM:N for limitation of the negative range.

8 - CARD BLOCK DIAGRAM

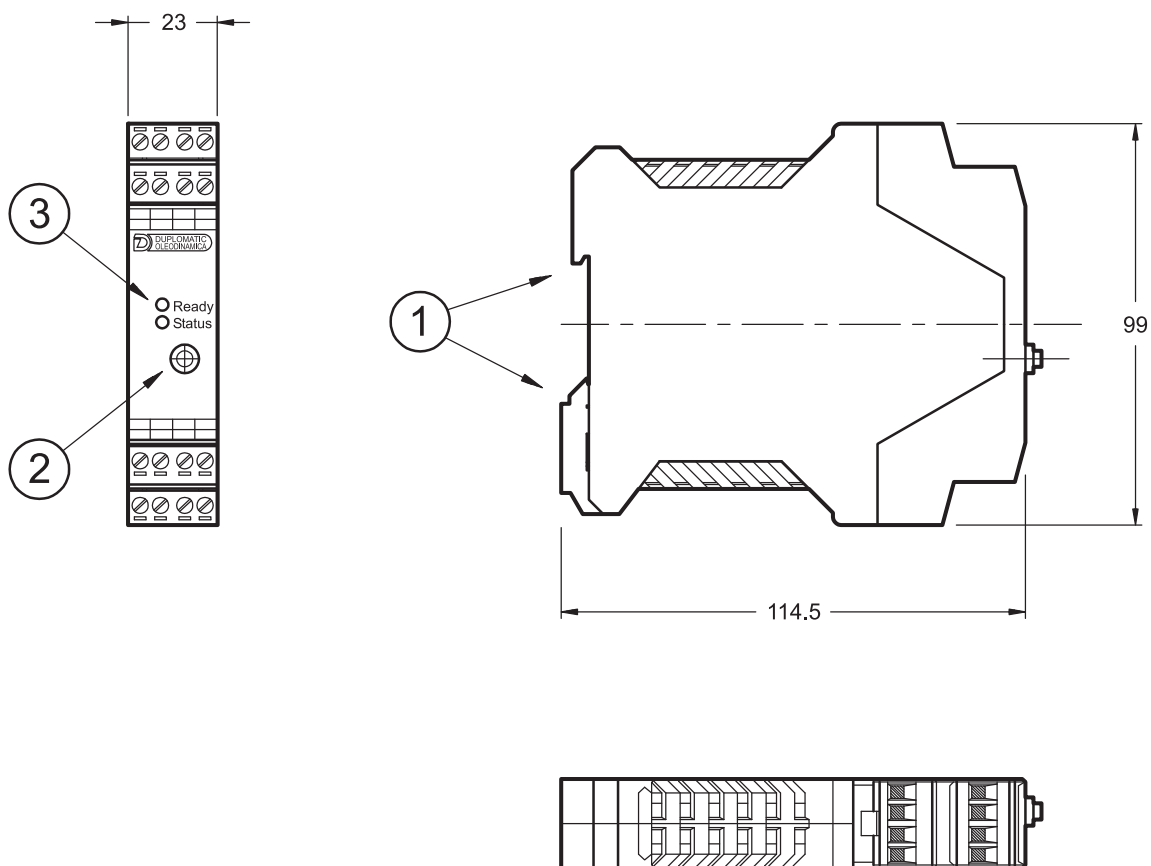




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9 - OVERALL AND MOUNTING DIMENSIONS



1	DIN EN 50022 rail type fastening
2	Plug for connection PC cable
3	LED for OUTPUT signals



DIPLOMATIC OLEODINAMICA S.p.A.
20025 LEGNANO (MI) • P.le Bozzi, 1
Tel. +39 0331.472.111
Fax +39 0331.548.328
www.diplomatic.com