

C4000

Photometric Converter



- Real-time photometric converter
- Factory zero for scattered light sensors
- Simultaneous operation of up to four inline sensors
- Process control functions via Remote or PROFIBUS[®] PA
- Readings in CU, ppm, EBC, FTU, g/L, etc.
- Integrated data logger for quality control
- 7 menu languages selectable: German, English, French, Dutch, Spanish, Portuguese and Russian

The Control 4000 is a powerful, microprocessor-based photometric converter. The advanced modular design enables precision process monitoring and control. The flexible C4000 is designed for optek ultraviolet (UV), visible (VIS), near-infrared (NIR) absorption-based and scattered-light based sensors.

The menu-based software is easy to use and configure and is available in German, English, French, Dutch, Spanish, Russian and Portuguese.

The high contrast white display is easy to read and remains configurable. The graphic display can show absorbance, transmittance and concentration in real time and in any unit of measure such as CU, ppm, EBC, FTU, and g/l. These measurements may also be displayed as text, bar graphs or trend values.

The C4000 software includes adjustable signal damping, 16 linearization tables, and advanced calculation capabilities. As an additional feature for scattered light sensors a factory zero point is implemented.

A secondary zero for additional offset as well as a slope adjustment is included. This manual adjustment can be used to compensate for long-term process related disturbances.

An integrated data logger captures vital process information for quality assurance and plant control records. This data is easily transferred to a PC via an RS232 port.

The C4000 series converters provide multiple analog and relay outputs for direct measurement and control. An optional remote card allows process functions such as product switching, ranging, remote zeroing, and hold to be triggered remotely from other process control instruments or systems. Some models are capable of multiplexing up to four optek inline sensors and/or probes.



The Control 4000 series converters are now available with an optional PROFIBUS[®] PA interface, which fulfills the Application Profile for Process Automation Version 3.01 with amendment 2. Using cyclic as well as acyclic data traffic the measuring results can be read out together with their corresponding information and product specific settings such as limits of the measuring range and the names of the units. The converter has eight product selections that can be independently configured. Each product can be setup with four measurement results, three alarm points, up to eight offset + slope sets and up to sixteen linearization tables. These pre-configured products can be changed locally or via access to an individual register via the bus.



Configuration

Converter C4000



Configurations CONTROL 4000	C4101	C4121	C4151	C4201	C4221	C4251
Inputs for optek sensors	1	1	1	2	2	2
mA-inputs	-	2	-	-	2	-
Remote-inputs	-	7	-	-	7	-
PROFIBUS® PA interface	-	-		-	-	
Relay-outputs	3	3	3	3	3	3
Failsafe (active)	1	1	1	1	1	1
mA-outputs	2	2	2	2	2	2
Lamp outputs for optek sensors	1	1	1	1	1	1
Permitted sensor combinations						
1 sensor AF16	x	x	x	x	x	x
1 sensor AS16 (not EX)	x	x	x	x	x	x
1 sensor AS56 (not EX)	x	x	x	x	x	x
1 sensor AF26				x	x	x
1 sensor AF45				x	x	x
1 sensor AF46						
1 sensor TF16				x	x	x
2 sensors AS56 + AS56 (not EX)				x	x	x
2 sensors AF16 + AF16						
2 sensors AS16 + AS16 (not EX)						
2 sensors AF16 + AS16 (not EX)						
2 sensors AF16 + AS56 (not EX)						
2 sensors AF16 + AF26						
2 sensors AF16 + AF45						
2 sensors AF16 + TF16						
2 sensors AF26 + AF26						
2 sensors AF26 + AF45 (not EX)						
2 sensors AF26 + TF16						
2 sensors AF45 + AF45						
2 sensors AF45 + TF16 (not EX)						
2 sensors TF16 + TF16						
3 sensors AF16 + 2x AS56 (not EX)						
3 sensors AF26 + 2x AS56 (not EX)						
3 sensors TF16 + 2x AS56 (not EX)						
3 sensors AF45 + 2x AS56 (not EX)						
4 sensors 2x AS56 + 2x AS56 (not EX)						

Configuration

Converter C4000



Configurations CONTROL 4000	C4202	C4222	C4252	C4322	C4352	C4422	C4452
Inputs for optek sensors	2	2	2	3	3	4	4
mA-inputs	-	2	-	2	-	2	-
Remote-inputs	-	7	-	7	-	7	-
PROFIBUS® PA interface	-	-		-		-	
Relay-outputs	3	3	3	3	3	3	3
Failsafe (active)	1	1	1	1	1	1	1
mA-outputs	4	4	4	4	4	4	4
Lamp outputs for optek sensors	2	2	2	2	2	2	2
Permitted sensor combinations							
1 sensor AF16	x	x	x	x	x	x	x
1 sensor AS16 (not EX)	x	x	x	x	x	x	x
1 sensor AS56 (not EX)	x	x	x	x	x	x	x
1 sensor AF26	x	x	x	x	x	x	x
1 sensor AF45	x	x	x	x	x	x	x
1 sensor AF46						x	x
1 sensor TF16	x	x	x	x	x	x	x
2 sensors AS56 + AS56 (not EX)	x	x	x	x	x	x	x
2 sensors AF16 + AF16	x	x	x	x	x	x	x
2 sensors AS16 + AS16 (not EX)	x	x	x	x	x	x	x
2 sensors AF16 + AS16 (not EX)	x	x	x	x	x	x	x
2 sensors AF16 + AS56 (not EX)	x	x	x	x	x	x	x
2 sensors AF16 + AF26				x	x	x	x
2 sensors AF16 + AF45				x	x	x	x
2 sensors AF16 + TF16				x	x	x	x
2 sensors AF26 + AF26						x	x
2 sensors AF26 + AF45 (not EX)						x	x
2 sensors AF26 + TF16						x	x
2 sensors AF45 + AF45						x	x
2 sensors AF45 + TF16 (not EX)						x	x
2 sensors TF16 + TF16						x	x
3 sensors AF16 + 2x AS56 (not EX)				x	x	x	x
3 sensors AF26 + 2x AS56 (not EX)						x	x
3 sensors TF16 + 2x AS56 (not EX)						x	x
3 sensors AF45 + 2x AS56 (not EX)						x	x
4 sensors 2x AS56 + 2x AS56 (not EX)						x	x

Technical Data

Converter C4000



Housing:

19"-version for Rack-mounting (front IP40 / rear IP20)
3 U/42 HP

Housing material:

stainless steel

Display:

LCD-graphic display 240 x 128 pixel,
LED-background illuminated
Display update: 0.5 seconds
1 LED (green): power on
3 LED (yellow): alarm I, II, III
1 LED (red-flashing): lamp failure

Display modes:

Numeric with bargraph, continuous trend-line and others configurable in any combination

Software tools:

- product definition: 8 user-configurable products
- 8 offset + slope sets
- linearization: 16 user-configurable tables
- auto zero: local or remote activated zero
- factory zero for scattered light sensors
- calibration: scattered light, mA Input/Output
- damping: selectable symmetric or asymmetric signal damping from 0 to 99.9 seconds
- memory: upon power failure, non-volatile memory retains all configurations and logged data
- password protection: codes for three levels

Data logger:

4 simultaneous results with approx. 25.000 points
(resolution max. 1/second), cycle memory

System clock:

accuracy approx. 1 minute / month
battery life about 15 years

Operation:

18 push button keyboard

Linearity (converter):

typically < 0.1 %, max. 0.5 %

Accuracy (converter):

typically < 0.3 %, max. 0.5 %

Language:

English, German, French, Spanish, Dutch, Portuguese, Russian

mA-inputs:

optional 2 x 4 -20 mA, galvanically isolated,
min. 500 V DC,
• accuracy: < 0.5 %,
• resolution: < 0.05 %,
• load: 200 Ohm

Remote-inputs:

optional 7 x 18 - 29 V DC, typically 6.0 mA, for:

- product choice
- measuring range
- zero adjustment (remote-zero)
- hold

PROFIBUS® PA interface:

optional PROFIBUS® PA profile, version 3.01 with amendment 2; voltage range: 9...32 V; power consumption 18 mA, functionally galvanically isolated to circuits which cannot become dangerously active (SELV / PELV)

optek detector inputs:

up to 4 inputs for optek sensors, 1 mA to 500 pA

mA-outputs:

2 or 4 x 0/4 - 20 mA (NAMUR),
galvanically isolated, min. 500 V DC

- accuracy: < 0.5 %
- resolution: < 0.05 %
- load: 0 - 600 Ohm

Relay-outputs:

3 independent software-configurable relay contacts
(0 - 50 V AC, 0 - 75 V DC, 0 - 2 A) with status indicator (LED)
for alarm or status feedback.
configurable initiation delays: 0 to 999 sec.

Faisafe:

1 SPDT contact to alarm in case of lamp or system failure (active)

Lamp outputs:

1 or 2 x lamp supply (4.5 - 8.5 V DC) for optek sensors

Serial communication:

RS232 bi-directional interface

Ambient conditions:

during operation (no direct light):

- converter: -10 °C to +55 °C (+14 °F to +131 °F)
- with housing S19-42: -20 °C to +45 °C (-4 °F to +113 °F)
- with housing B19-42: -10 °C to +40 °C (+14 °F to +104 °F)
- transport: -20 °C to +70 °C (-4 °F to +158 °F)

EN 61010-1 / 2002-08 / class 2 / category II

Internal operating temperature:

-20 °C to +75 °C (-4 °F to +167 °F)

Power Supply (fixed):

115/230 V AC selectable or 24 V AC/DC

Power consumption:

max. 50 VA

Cable length:

up to 1312 ft. (400 m), depending on sensor

Certificates:

ISO 9001:2000, GS, FM, ATEX, CE

Use with TF-, AF and AS-series sensors and probes!

Options

IP65-version

for front panel mounting with gasket IP65
front side

T19-42

portable Table top housing
Front IP40 / rear IP20

B19-42

Polymer enclosure for wall mounting, IP66

S19-42

stainless steel enclosure for wall mounting,
IP65

Flameproof housing

flameproof for EEx de (ia/ib) IIB T5, IP65

PC-Transfer Software

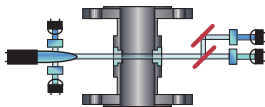
Software C4000 PC-Transfer Basic or
Advanced Version and manuals on CD-ROM

PROFIBUS® PA

PROFIBUS® PA profile, version 3.01
with amendment 2

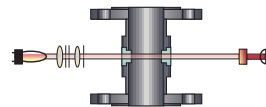


Turbidity • Color • Concentration • UV-Absorption



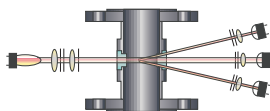
Sensor AF46

UV Absorption, Dual Channel
Concentration Measurement with
Compensation of Background Turbidity
and Lamp Intensity Variations



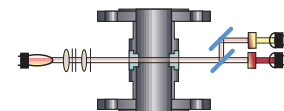
Sensor AF16

VIS and NIR Absorption, Single Channel
Concentration and Color Measurement



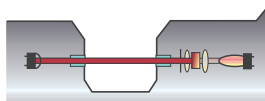
Sensor TF16

Scattered Light, Dual Channel Turbidity
Measurement with Color Compensation



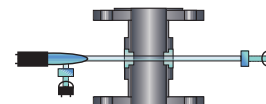
Sensor AF26

VIS Absorption, Dual Channel Color
Measurement with Turbidity Compensation



Probe AS16/AS56

VIS and NIR Absorption, Single Channel
Concentration and Color Measurement



Sensor AF45

UV Absorption, Single Channel
Concentration Measurement with Compensa-
tion of Lamp Intensity Variations