

Application Overview: SmartSwitch

What is a SmartSwitch?

The term "SmartSwitch" has been around since the first stand alone system Masterleo produced that provided the ability to detect and alert operators of the precise time in which their water-to-product and product-to-water transitions were completed. It started rather simply and the system caused a light to flash when good product began flowing down the drain. This flashing light was the signal for operators to switch from sending product down the drain during this transition. This concept has evolved and now provides the flexibility to tie into your existing control system or have a fully independent system control your valve switching based on the information our optical sensors are reporting.



The Problem:

When do you *know* that it is the right time to switch from a floor drain and begin the processing of your product? We know that some companies use a time delay, while others may have an operator look for "the right" color or consistency of the product before they manually make the switch.

The problem with most methods of water-to-product, product to water, and product-to-product transitions is that they are not precise. Different products can vary in time to transition and this only compounds the issue. When you do not have precision with your transitions, here are the most likely outcomes:

- 1) Diluted product is being processed
- 2) Good, undiluted product is heading down the drain

In most cases, having either one of these outcomes is not optimal for your customers, or your bottom line.

The Solution:

The first thing that we need is a highly accurate, repeatable, and stable optical sensor. Optek's optical sensors have proved they are up to the challenge and because of their extensive selection, we can help you control what is going down your drain regardless of the type of product you are producing. The optical sensor communicates with a controller that provides you with a 4-20mA output.



Masterleo will help to find you the appropriate sensor for your application.

Once installed, we can also help you data log your product groups and determine threshold limits based on your needs. From there, we are ready to tie this application into your existing controls or create a custom control solution for you.

Visit our SmartSwitch page on our website for more information:

<http://masterleo.com/applications/view/smartswitch>

975 EASTWIND DR., SUITE 180, WESTERVILLE, OH 43081

800.779.1444 • 614.895.1608 • FAX: 614.882.1606

WWW.MASTERLEO.COM

FILLER/CAPPER & SURGE TANK

CAPPER

LINE MONITORING

WEB INTERFACE

Screens

FP TANK

SURGE TANK

VALVE MANIFOLD

FILLER SETUP & CONTROL

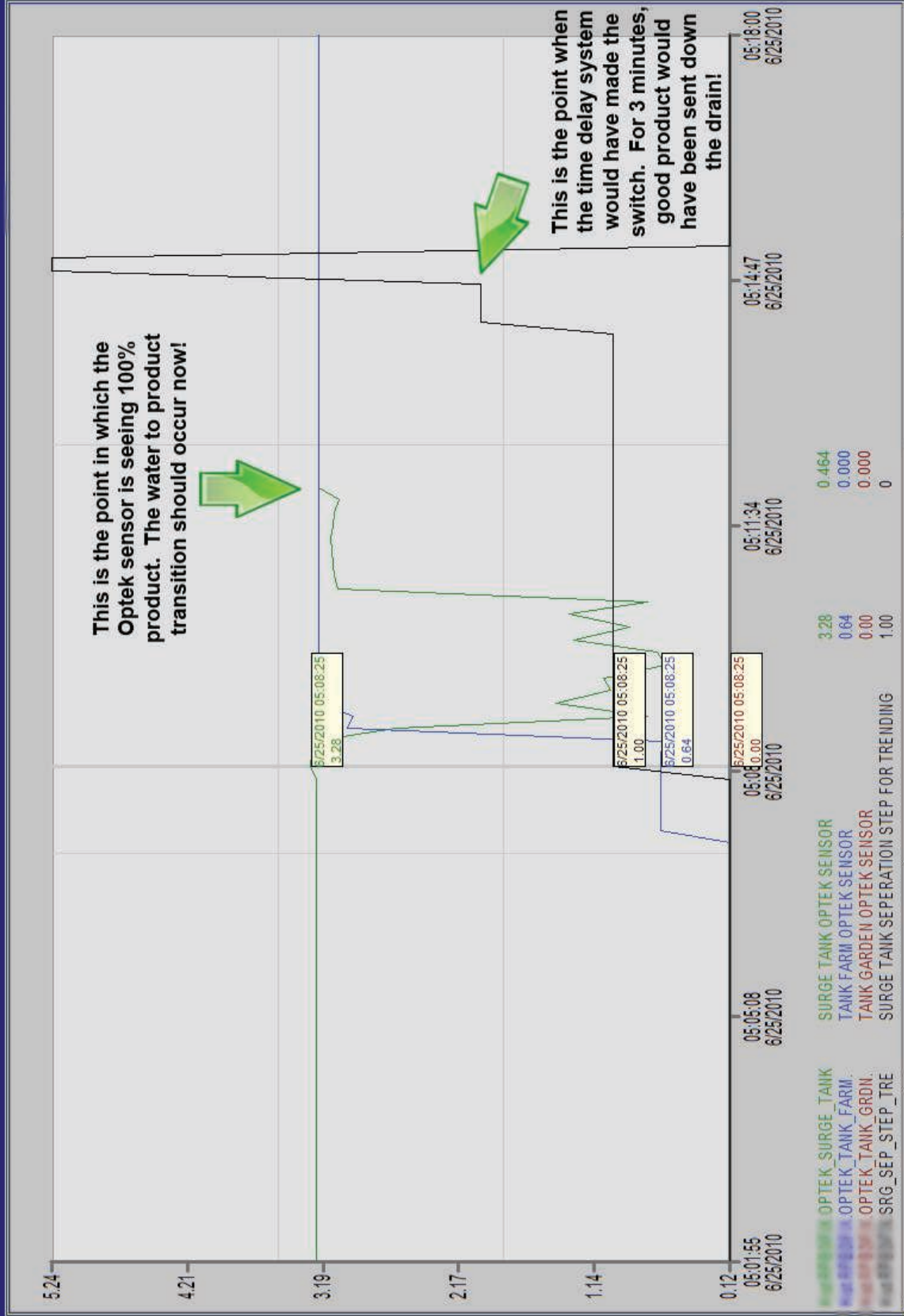
FILLER CONFIG & MAINTENANCE

FILLER CIP

FILLER CIP TREND

EMPTY BOTTLE

TANK LEVELS



17:57:32

7/11/2010

CAP HEATER SUPPLY 59.2 °F

PLENUM 61.0 °F

AIR RINSE NOZZLE PRESS.

0.0 PSI

FP TANK LEVEL

0 LBS

SURGE TANK LEVEL

258 LBS

PRODUCT REQUEST

OFF

LOGIN

NEXT

PREVIOUS

ALARMS

AF16-N

Single Channel NIR Absorption Sensor



- Inline real-time process monitoring
- Color independent concentration measurement
- High dynamic measuring range
- Extremely low maintenance
- CIP/SIP-compatible
- Broad variety of line sizes, process connections and wetted materials
- NIST-traceable validation accessories

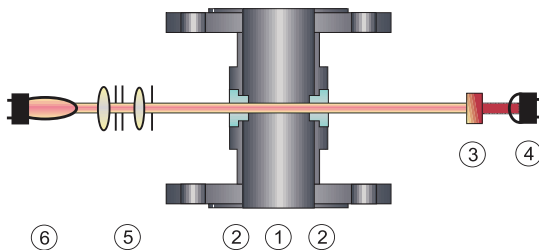
The model AF16-N is a precise, single channel NIR absorption sensor. The inline sensor is designed for a variety of industrial processes. The AF16-N measures concentration or turbidity with great accuracy and repeatability and can be used in demanding applications such as filter control, phase separation and yeast cell concentration.

The AF16-N uses light in the Near Infrared range (NIR) from 730 to 970 nm. A precisely defined, constant light beam penetrates the process medium. The attenuation of the light intensity, caused by absorption and/or scattering by dissolved and undissolved substances in the medium, is detected by a hermetically sealed silicon photodiode.

Optical path lengths (OPL) are available from 1 to 1000 mm for process versatility. The AF16-N is equipped with a special optical filter and performs concentration measurement independent of any color influences.

The special optical window is made from a single crystal sapphire. This provides superior resistance to all abrasive and corrosive media.

The AF16-N is available with a broad variety of line sizes, process connections and wetted materials and can be adapted easily to the process. NIST-traceable validation accessories assures absolute measurement confidence. Options for hazardous area classification are also available.



Type AF16-N

- | | |
|---------------|-----------------|
| 1 Sensor body | 4 Detector |
| 2 Windows | 5 Optics module |
| 3 NIR filter | 6 Lamp |

Technical Data

Sensor AF16-N

**Material:**

sensor body made of stainless steel
SS 316 Ti, 1.4571 (standard)

Special materials:

SS 316 L (1.4435), 1.4539, 1.4462, TFM 4215, Hastelloy® C4, Hastelloy® C22, Titanium, Tantalum, Monel® 400, Inconel® 625, PP, and others on request.

Line size:

¼" to 8", (DN 6 to DN 200)

Process connections:

ASME Flange, DIN Flange, Varivent, JIS Flange, Tri-Clamp, BBS-Clamp, Female Thread NPT, Female Thread DIN ISO 228/1 G, Sanitary Thread (DIN 11851), and others on request.

Gaskets:

Viton®, EPDM (FDA), EPDM (USP Class VI), Kalrez®, Chemraz®, Fluoraz®, Buna (NBR), Silicone, Viton® /FEP (FDA), and others on request.

Windows:

Pyrex®, Sapphire

Optical path length:

1 mm – 1000 mm

Process pressure:

10 mbar to 325 bar, (0.15 psi to 4713 psi),
depending on process connection, material and design

Process temperature:

values are only valid with appropriate material of sensor body and gaskets. No icing on sensor!

- permanent: 0 °C to +120 °C, (+32 °F to +248 °F)
- peak (15 min/day): 0 °C to +150 °C, (+32 °F to +302 °F)

Ambient temperature:

- operation: 0 °C to +40 °C, (+32 °F to +104 °F)
(elevated or reduced ambient temperatures may require restrictions to the operating temperatures stated above!)
- transport: -20 °C to +70 °C, (-4 °F to +158 °F)

Air purge:

connectors available as standard

Light source:

incandescent tungsten lamp: 5.0 V DC, 775 mA,
typical life span 3 to 5 years

Wavelength range:

730 nm - 970 nm

Detector:

silicon photodiode, hermetically sealed

Calibration:

basic calibration in CU (concentration units)

Measuring range:

any measuring range between
0 - 0.05 to 5 CU

Resolution:

< ± 0.05 % of respective measuring range

Repeatability:

< ± 0.5 % of respective measuring range

Linearity:

specific to application, < ± 1% of respective measuring range

Protection:

all optical parts protected according to IP65

Cable lengths:

standard: 5, 10, 20, 35, 50 m, (16, 33, 66, 115, 164 ft.)
maximum: 250 m, (820 ft.)

VA-plug-protection:

special ultra-shielded cable sets,
optional rigid stainless steel connector

Certificates:

ISO 9001:2000, ATEX, FM, PED, CE, HPO

Use with C4000 converter!

Options



Measuring cells for any application

AF16-HT-N

high temperature model
permanent:
-20 °C to +240 °C, (-4 °F to +464 °F)
peak (15 min/day):
-20 °C to +260 °C, (-4 °F to +500 °F)

Validation adapter

modular adapter with application specific
validation filter for sensor verification

AF16-EX-N and AF16-EX-HT-N

ATEX and FM flameproof versions for safety
and confidence in all hazardous area classification, Approval report:
DMT ATEX E176, FMG J.I. 3013884
(please contact us for separate data sheet)

