

# Manually Controlled Fluid Sampling System

Patent pending

HY

## Features and Benefits

- Provides Local Visibility to the Fluid Condition of Critical Systems.
- Integrated micro VSD, (Variable Speed Drive), pump/motor provides optimal flow for accurate sensor readings in variable conditions.
- The HY-TRAX<sup>®</sup> Manually Controlled Fluid Sampling System allows a user to retrieve ISO cleanliness levels from a reservoir tank or a low-pressure line (<50 psi max).
- The compact design allows for installations with tight space constraints.
- The Manual rheostat VSD pump controller is housed in a compact IP 40 enclosure and allows the user to adjust the pump flow for optimal sensor readings.
- Optional AC adapter allows the unit to operate on 115 VAC 60 Hz. 24 VDC is standard.
- Rugged design for field use.
- Viton<sup>®</sup> seals.
- Fluid viscosities up to 350 cSt.
- Flow control valve providing optimal pressure for accurate sensor readings.



## Applications

- Mobile Equipment Technology
- Surface Mining
- Construction
- Monitoring of Oil Cleanliness in Storage Tanks
- Fleet Services
- Rail

## Manually Controlled Fluid Sampling System

## What's Included

- TestMate<sup>®</sup> Contamination Monitor (TCM)
- Machined, 6061-T651 aluminum alloy manifold block with anodized surface treatment.
- Specially designed fitting for mating to pump/motor.
- Viton<sup>®</sup> seals.
- Plugged water sensor port (G3/8)
- VSD (Variable Speed Drive) Motor Power Supply and Control Cable
- Water Sensor (TWS-D) Power Supply and Signal Cable (only supplied with optional water sensor (TWS-D))
- Contamination Monitor (TCM) output signal, USB-B Female Port for use with Windows-Based Computer and FluMoS Software, located on Control Enclosure
- Contamination Monitor (TCM), output signal, M12x1, 8 pole, Male Port, located on Control Enclosure, for use with PLC or RS485 Communication, analog or digital, 4 - 20 mA is standard, 2 to 10 V is optional
- Flow control valve
- VSD (Variable Speed Drive) pump/motor
- Manual rheostat pump controller
- IP 40 enclosure
- Fluid Inlet/Outlet Porting (SAE Size 04 ORB)
- 24 VDC Power Supply (NC3MP Female Connector)
- Optional 115 VAC Power Supply with Cord
- Contamination Monitor (TCM) Power and Signal Cable
- Water Sensor (TWS-D) M12x1, 5 pole Signal Output Connection, Male Port, located on Control Enclosure
- Contamination monitor (TCM) power connection, female M12x1, 8 pole located on control enclosure
- Water sensor (TWS-D) power connection, M12x1, 5 pole Female located on control enclosure

CS 1000

CS 1939

CSI-C-11

HY-TRAX<sup>®</sup>

RBSA

CSM

TFL

TFH

FCU

MCS

AS

SMU

CTU

EPK

Trouble

Check Plus

HMG2500

HMG4000

ET-100-6

HTB

RFSA

HFS-BC

HFS-15

MFD-BC

MFS, MFD

HY-TRAX<sup>®</sup>  
Retrofit System

MFD-MV

MFS-HV

AMS, AMD

FS

AMFS

KLS, KLD

MCO

AKS, AKD

LSN, LSA, LSW

X Series

OLF Compact

OLF

OLF-P

NxTM

VEU

IXU

Triton-A

Triton-E

NAV

SVD01

SVD

OXS

Appendix

## Specifications

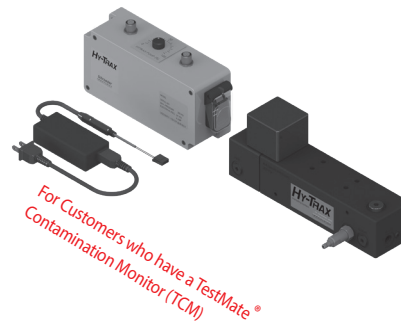
Measuring Range:	Display ISO ranges between 25/24/23 and 9/8/7 Calibration within the range ISO 13/11/10 to 23/21/18		
Contamination Output Code:	Standard: ISO 4406:1999 or SAE AS 4059(D) Optional: ISO 4406:1987; NAS 1638 and ISO 4406:1999		
Self-Diagnosis:	Continuously with error indication via status LED		
Pressure Rating:	50 psi (3.4 bar) max		
Fluid Inlet/Outlet:	SAE ORB, Size 4		
Seal Material:	Viton®		
Pump Speed:	500-5000 rpm (adjustable)		
Optimal Sampling Pump Flow Rate:	0.008-0.079 gpm (30-300 mL/min)		
Fluid Temperature Range:	32°F to 185°F (0°C to +85°C)		
Ambient Temperature Range:	-22°F to 176°F (-30°C to 80°)		
Max Viscosity:	1622 SUS (350 cSt)		
Pump Type:	Gear Pump		
Power Supply Voltage:	24 VDC +/- 10%, Residual Ripple <10%		
Max Power/Current Consumption:	100 Watt/ 4 amp		
Electric Output:	4-20 mA analog output; 2 to 10 V analog (option for contamination monitor (CS)) RS485 for communication with FluMoS Software		
Electrical Specifications:	4 - 20 mA analog output (max burden 330 Ω) 2 to 10 V output (min load resistor 82 Ω) Limit switching output (Power MOSFET): max current 1.5A		
TestMate® Contamination Monitor (TCM) Signal Output Connections Located on Control Enclosure:	USB-B Female Port for use with Windows-based computer and FluMoS Software M12x1, 8 pole, Male Port, Analog or Digital, for use with PLC or RS485 Communication, (4 - 20 mA is standard). 2 to 10 V is optional, must specify when ordering TestMate® Contamination Monitor (TCM)		
Water Sensor (TWS-D) Signal Output Connection Located on Control Enclosure:	Water sensor (TWS-D) M12x1, 5 pole Signal Output 5 pole Male Port, located on Control Enclosure		
Electrical Safety Class:	III (low voltage protection)		
Enclosure Ratings:	IP 40 enclosure		
Weight and Dimensions			
Communications Module Control TestMate® Sensor	Fluid Sampling System Manifold w/ TCM & VSD Pump/Motor	HY-TRAX® Manual Control Module	Fluid Sampling Manifold w/ Communications Module & VSD Pump/ Motor
	10 lbs. (4.5 kg)	5 lbs. (2.5 kg)	15 lbs. (6.8 kg)
	10.3" x 6.8" x 4.3" (262 x 173 x 109 mm)	9.3" x 5.7" X 2.6" (236 X 145 x 65 mm)	

### Features and Benefits

- Provides Local Visibility to the Fluid Condition of Critical Systems.
- Integrated micro VSD, (Variable Speed Drive), pump/motor provides optimal flow for accurate sensor readings invariable conditions.
- Designed to be used with Schroeder Industries TestMate® contamination monitor (TCM) and optional water sensor.
- The HY-TRAX® Manually Controlled Fluid Sampling System allows a user to retrieve ISO cleanliness levels from a reservoir tank or a low-pressure line (50 psi max).
- The compact design allows for installations with tight space constraints.
- The Manual VSD pump controller is housed in a compact IP 40 enclosure and allows the user to adjust the pump flow for optimal sensor readings.
- Optional AC adapter allows the unit to operate on 115 VAC 60 Htz.
- Rugged design for field use.
- Viton® seals.
- Fluid viscosities up to 350 cSt.
- Flow control valve providing optimal pressure for accurate sensor readings.
- Manual rheostat control adjusts VSD (Variable Speed Drive) pump speed to adjust for variances in fluid viscosities.

- Machined, 6061-T651 aluminum alloy manifold block with anodized surface treatment.
- Specially designed fitting for mating to pump/motor.
- Viton® seals.
- Plugged water sensor port (G3/8)
- VSD (Variable Speed Drive) Motor Power Supply and Control Cable
- Flow control valve
- VSD (Variable Speed Drive) pump/motor
- Manual rheostat pump controller
- IP 40 enclosure

- Fluid Inlet/Outlet Porting (SAE Size 04 ORB)
- 24 VDC Power Supply (NC3MP Female Connector)
- Optional 115 VAC Power Supply with Cord
- Water Sensor (TWS-D) M12x1, 5 pole Signal Output Connection, Male Port, located on control enclosure
- TestMate® Contamination monitor (TCM) power connection, female M12x1, 8 pole located on control enclosure
- Water sensor (TWS-D) power connection, M12x1, 5 pole Female located on control enclosure



HY-TRAX®  
Fluid Sampling  
System  
Manifold  
with Manual  
Controller and  
VSD Pump/  
Motor

### What's Included

Model Number  
Selection

How to Build a Valid Model Number for a Schroeder HY-TRAX®

Manually Controlled Fluid Sampling System:

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6	BOX 7	BOX 8	BOX 9
HY								

Example: NOTE: One option per box

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6	BOX 7	BOX 8	BOX 9
HY		H		M				

= HYHM

BOX 1	BOX 2	BOX 3	BOX 4
Model	TestMate® Contamination Monitor (TCM)	Fluid Type	TestMate® Contamination Monitor (TCM) Signal Output
HY	Omit = TCM w/ display ND = TCM w/ no display NT = Manifold supplied w/ no TCM, Customer will supply TCM (manifold mount version needed)	H = For use w/ Hydraulic & Diesel Fuel only*	Omit = 4-20 mA S = 2 to 10 V analog output

BOX 5	BOX 6
TestMate® Contamination Monitor (TCM) Output Options	Water Sensor (TWS) Option
M = ISO 4406/SAE 4049 N = ISO 4406/NAS 1638	Omit = None TWS-D = Water sensor w/ display

BOX 7	BOX 8	BOX 9
Manually Controlled Sampling System	Power Options	Air Suppression Loop
Omit = Panel with Rheostat flow control, power and signal output for HY-TRAX® sampling system	Omit = 24 VDC P = 115 VAC	Omit = None L = Looped hose and fitting

\*Note: Off-road diesel contains dye. High concentrations of dye may interfere with particle count results. Please contact factory to review application.

### Features and Benefits

- Provides Remote Visibility to the Fluid Condition of Critical Systems.
- Integrated micro VSD, (Variable Speed Drive), pump/motor provides optimal flow for accurate sensor readings in variable conditions.
- This HY-TRAX® Remote Oil Contamination Sensor Package allows remote access via the Internet and smart devices to fluid particle counts, temperature, and percent water saturation levels (optional) displayed on a customizable dashboard. The fluid sampling system collects data and the communications module transmits this data via GSM cellular at scheduled intervals. Users can receive alerts via email when a fluid's ISO contamination code or water saturation level (optional) reaches user defined critical levels. The unit can sample fluid directly from a fluid reservoir or low pressure line (<50 psi).
- The Communications Module automatically controls fluid flow to compensate for viscosity changes due to temperature or fluid type. All data is transmitted through a secure VPN and archived in a protected database in the cloud to allow real-time and historical analysis.
- The HY-TRAX® Communications Module will provide maintenance managers with the visibility and vital information necessary to pro-actively schedule preventative maintenance on local and remote equipment. Maintenance decisions can now be based on accurate and real-time data.
- The communications module components are mounted and housed in a rugged IP 40 enclosure.
- Fluid sampling system standard with Viton® seals.
- Fluid viscosities up to 350 cSt.
- 50 psi (max.) working pressure.
- Flow control valve providing optimal pressure for accurate sensor readings.
- VSD, (Variable Speed Drive), pump/motor providing optimal flow for accurate sensor readings.



### Applications

- Mobile Equipment Technology
- Surface Mining
- Construction
- Monitoring of Oil Cleanliness in Storage Tanks
- Fleet Services
- Rail

- TestMate® Contamination monitor (TCM)
- Flow Control Valve
- GSM cellular communications
- VSD pump/motor
- Machined, 6061-T651 aluminum alloy manifold block with anodized surface treatment
- TestMate® Contamination Monitor (TCM) Communications/Power Cable
- Specially designed fitting for mating to pump/motor
- Plugged water sensor port (G3/8)
- IP 40 enclosure
- Water sensor (optional)
- 24 volts DC standard with optional 115 VAC Power Supply
- Optional Water Sensor (TWS-D) Communication/Power Cable
- Fluid Inlet/Outlet Porting (SAE Size 04 ORB)

### What's Included

## Specifications

Measuring Range:	Display ISO ranges between 25/24/23 and 9/8/7 Calibration within the range ISO 13/11/10 to 23/21/18		
Contamination Output Code:	Standard: ISO 4406:1999 or SAE AS 4059(D) Optional: ISO4406:1987; NAS 1638 and ISO 4406:1999		
Self-Diagnosis:	Continuously with error indication via status LED		
Pressure Rating:	50 psi (3.4 bar) max		
Fluid Inlet/Outlet:	SAE ORB, Size 4		
Seal Material:	Viton®		
Pump Speed:	500-5000 rpm (adjustable)		
Optimal Sampling Pump Flow Rate:	0.008-0.079 gpm (30-300 mL/min)		
Fluid Temperature Range:	32°F to 185°F (0°C to +85°C)		
Ambient Temperature Range:	-22°F to 176°F (-30°C to 80°)		
Max Viscosity:	1622 SUS (350 cSt)		
Pump Type:	Gear Pump		
Power Supply:	24 volts DC		
Power Consumption:	4A		
Communications Module Signal Output:	GSM cellular Communication to monitoring website		
Electrical Safety Class:	III (low voltage protection), IP 40 enclosure		
Cellular Communications:	AT&T Quad Band GSM (850, 900, 1800, 1900 MHz)		
Weight and Dimensions			
Communications Module Control TestMate® Sensor	Fluid Sampling System Manifold w/ TCM & VSD Pump/Motor	HY-TRAX® Communications Module	Fluid Sampling Manifold w/ Communications Module & VSD Pump/ Motor
	10 lbs. (4.5 kg)	10 lbs. (4.5 kg)	20 lbs. (9.1 kg)
	10.4" x 6.8" x 4.3" (264 x 173 x 109 mm)	14.7" x 11.3" x 5.25" (374 x 287 x 133 mm)	

### Features and Benefits

- Integrated micro VFC, (Variable Speed Drive), pump/ motor provides optimal flow for accurate sensor readings in variable conditions
- Rugged design for field use
- Fluid viscosities up to 350 cSt
- 50 psi (max.) working pressure
- Flow control valve providing optimal pressure for accurate sensor readings
- Designed to be used with Schroeder Industries' communications module and optional water sensor

### What's Included

- Machined, 6061-T651 aluminum alloy manifold block with anodized surface treatment.
- Specially designed fitting for mating to pump/motor.
- Viton® seals.
- Plugged water sensor port (G3/8)
- Flow control valve
- Contamination Monitor
- Micro VSD pump/motor
- Fluid Inlet/Outlet Porting (SAE Size 04 ORB)



HY-TRAX®  
Fluid Sampling  
System  
Manifold with  
Contamination  
Sensor and  
VSD Pump/  
Motor

### Features and Benefits

- Provides Remote Visibility to the Fluid Condition of Critical Systems.
- Integrated micro VSD, (Variable Speed Drive), pump/ motor provides optimal flow for accurate sensor readings in variable conditions.
- Designed to be used with Schroeder Industries contamination monitor (TCM - manifold mount version only) and optional water sensor.
- This HY-TRAX® Remote Oil Contamination Sensor Package allows remote access via the Internet and smart devices to fluid particle counts, temperature, and percent water saturation levels (optional) displayed on a customizable dashboard. The fluid sampling system collects data and the communications module transmits this data via GSM cellular at scheduled intervals or on demand. Users can receive alerts via email when a fluid's ISO contamination code or water saturation level (optional) reaches user defined critical levels. The unit can sample fluid directly from a fluid reservoir or low pressure line (<50psi).
- The Communications Module automatically controls fluid flow to compensate for viscosity changes due to temperature or fluid type. All data is transmitted through a secure VPN and archived in a protected database in the cloud to allow real-time and historical analysis.
- The HY-TRAX® Communications Module will provide maintenance managers with the visibility and vital information necessary to pro-actively schedule preventative maintenance on local and remote equipment. Maintenance decisions can now be based on accurate and real-time data.
- The communications module components are mounted and housed in a rugged weatherproof IP 40 enclosure.
- Fluid sampling system standard with Viton® seals.
- Fluid viscosities up to 350 cSt.
- 50 psi (max.) working pressure.
- Flow control valve providing optimal pressure for accurate sensor readings.
- VSD, (Variable Speed Drive), pump/motor providing optimal flow for accurate sensor readings.



For Customers who have a TestMate®  
Contamination Monitor (CS)  
(CS must be 4-20 mA output)

### What's Included

- Flow Control Valve
- GSM cellular communications
- VSD pump/motor
- Machined, 6061-T651 aluminum alloy manifold block with anodized surface treatment
- Specially designed fitting for mating to pump/motor
- IP 40 enclosure
- Plugged water sensor port (G3/8)
- Fluid Inlet/Outlet Porting (SAE Size 04 ORB)

HY-TRAX®  
Fluid Sampling  
Manifold with  
Communications  
Module and  
VSD Pump/  
Motor

HY-TRAX®  
Telematics  
Communications  
Module only  
operates with  
TCM's operating on  
Firmware 3.0 and  
4-20 mA outputs.  
Older firmware  
versions will not  
communicate  
proper flow rate  
to the telematics  
module. Contact  
factory for more  
details.

## HY-TRAX® Communications Module

HY-TRAX® Telematics Communications Module can be utilized on existing CS installations when the sensor receives adequate pressure (>120 psi) and flow (30-150 mL/min) from the hydraulic system. The CS must have 4-20 mA outputs and Firmware version 3.0.



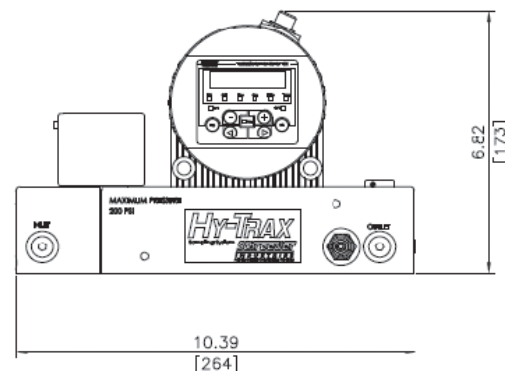
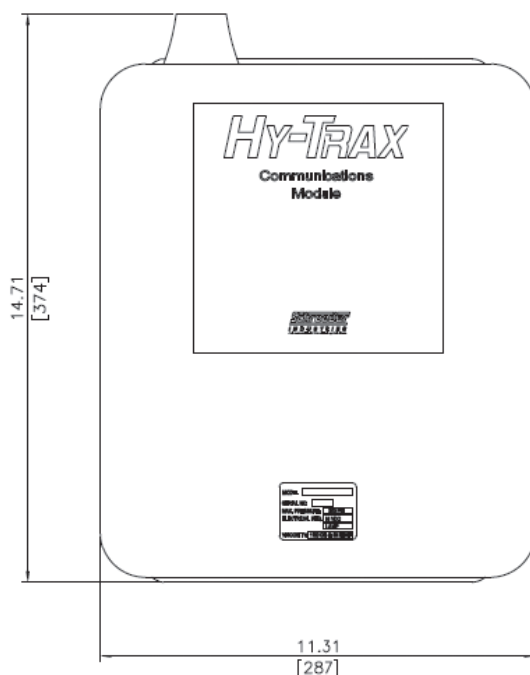
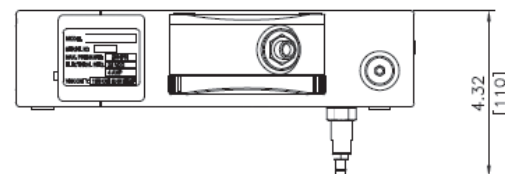
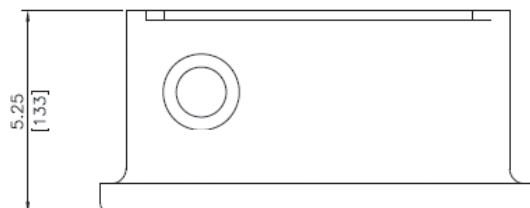
HY-TRAX® Communications Module Only.  
Order part # HY-COMMOD

### What's Included

- GSM cellular communications
- IP 40 enclosure
- VSD, (Variable Speed Drive), Motor Controller
- 115 VAC Power Supply

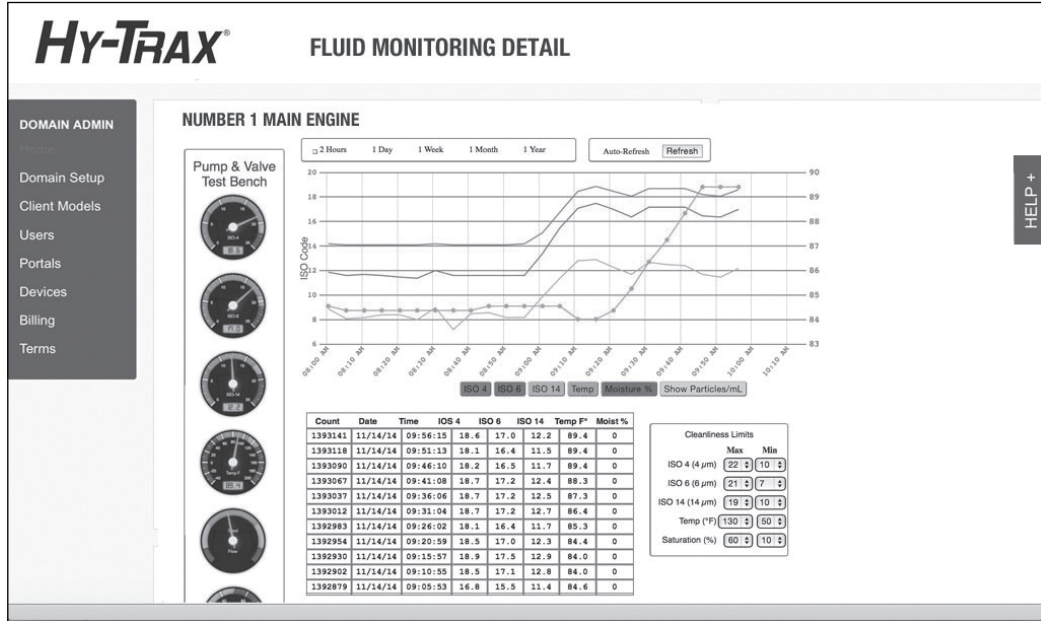
### Features and Benefits

- Provides remote visibility to the fluid condition of critical systems.
- The HY-TRAX® Remote Oil Contamination Communications Module allows remote access via the Internet and smart devices to fluid particle counts, temperature and percent water saturation levels (optional) displayed on a customizable dashboard. The Communications Module collects and transmits data via GSM cellular at scheduled intervals. Users can receive alerts via email or text when the fluid's ISO contamination code or water saturation level (optional) reaches user defined critical levels.
- The Communications Module automatically controls fluid flow to compensate for viscosity changes due to temperature or fluid type. All data is transmitted through a secure VPN and archived in a protected database in the cloud to allow real-time and historical analysis.
- The HY-TRAX® Communications Module will provide maintenance managers with the visibility and vital information necessary to pro-actively schedule preventative maintenance on local and remote equipment. Maintenance decisions can now be based on accurate and real-time data.
- The communications module components are mounted and housed in a rugged IP 40 enclosure.

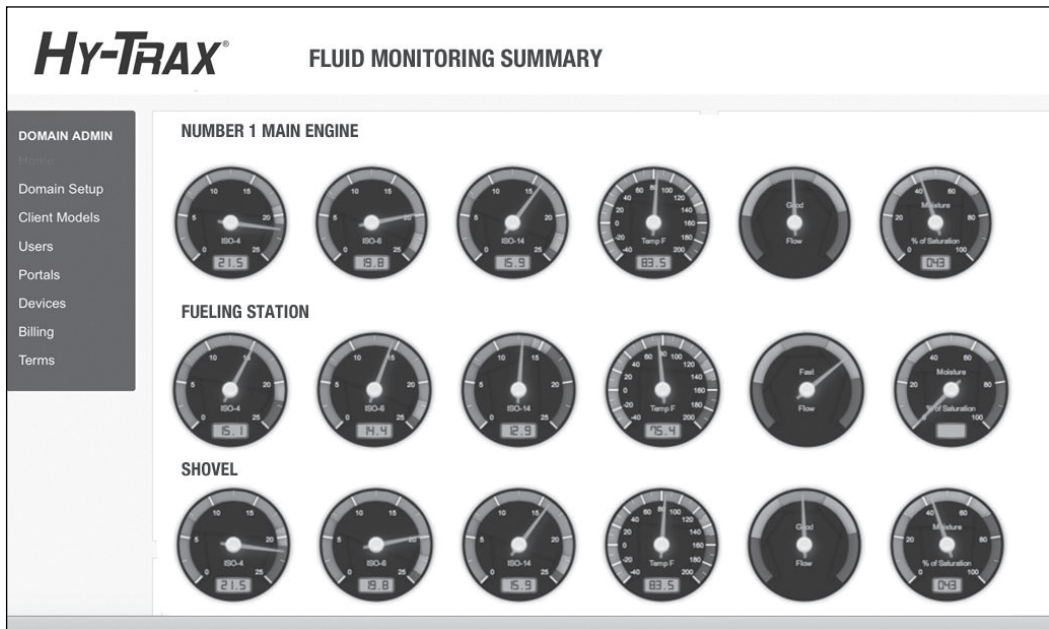




Example of  
HY-TRAX®  
Communications  
Modules  
Dashboard  
Contamination  
Chart



Example of  
HY-TRAX®  
Communications  
Modules  
Dashboard  
Gauge Panel



## Model Number Selection

How to Build a Valid Model Number for a Schroeder HY-TRAX® Telematic Communications Module with Remote Controlled Fluid Sampling System:

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6	BOX 7	BOX 8	BOX 9
HY								

Example: NOTE: One option per box

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6	BOX 7	BOX 8	BOX 9
HY		H		M		A		

= HYHMA

HY-TRAX®  
Telematics  
Communications  
Module only  
operates with  
CS's operating on  
Firmware V03.00.  
Older firmware  
versions will not  
communicate  
proper flow  
rate to the  
telematics module.  
Contact factory  
for additional  
information.

BOX 1	BOX 2	BOX 3	BOX 4
Model	TestMate® Contamination Monitor (TCM)	Fluid Type	TestMate® Contamination Monitor (TCM) Signal Output
HY	Omit = TCM w/ display ND = TCM w/ no display NT = Manifold supplied w/ no TCM, Customer will supply TCM; TCM must be 4-20 mA output only	H = For use w/ Hydraulic & Diesel Fuel only*	Omit = 4-20 mA  NOTE: For customers with existing TCMs w/ a 2 to 10 V analog output please see HY-TRAX® Manually Controlled Sampling System

BOX 5	BOX 6	BOX 7
TestMate® Contamination Monitor (TCM) Output Options	Water Sensor (TWS) Option	Communications Module w/ Remote Controlled Fluid Sampling System
M = ISO 4406/SAE 4049 N = ISO 4406/NAS 1638	Omit = None TWS-D = Water sensor w/ display	A = Telematic Communications Module w/ Dashboard Data Display (GSM Cellular) NOTE: For customers with existing TCMs w/ a 2 to 10 V analog output please see HY-TRAX® Manually Controlled Sampling System

BOX 8	BOX 9
Communications Module Power Options	Air Suppression Loop
Omit = 24 VDC P = 115 VAC	Omit = None L = Looped hose and fitting

\*Note: Off-road diesel contains dye. High concentrations of dye may interfere with particle count results. Please contact factory to review application.