Guide to Operation

Satellite XT FTT Versions
Satellite XT 9602-0400 FTT
Satellite XT 9602-0405 FTT/R
Satellite XT 9602-0450 FTT/C
Including Options:
Extractive Module XT
Pyrolyzer Module XT
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This section provides basic understanding of the instrument and its operation.

1.1 Principle of Operation

The Satellite XT is a gas monitoring instrument especially designed for the continuous surveillance of hazardous gas concentrations. The instrument is designed to interface with LONWORKS™ free topology systems. A free topology architecture allows the user to wire gas monitoring instruments and control devices with virtually no topology restrictions. Power is supplied by a local 12 to 24 VDC power supply.

Target gas and measuring range depend on the type of sensor chosen. The sensor comes with the specific data in its internal data memory. When a sensor is inserted, these data are loaded into the instrument's internal memory.

Satellite XT versions FTT and FTT/R use electrochemical sensors for the surveillance of toxic and corrosive gases at TLV levels (TLV = Threshold Limit Value). The sensor output signal is amplified electronically, digitised and the resulting concentration value is transmitted to the communication network.

The Satellite XT FTT/C is used for monitoring combustible gases and vapours. This instrument version uses catalytic sensors and is factory calibrated for the detection of methane in air mixtures with concentrations up to 5 %-vol. (100 % LEL Lower Explosion Limit). The sensor output signal is amplified electronically, digitised and the resulting concentration value is transmitted to the communication network. To allow the surveillance of a variety of other combustible gases, a correction factor called “K–Factor” can be entered.

The Satellite XT FTT/R includes the relay option and provides 3 single-pole single-throw relays for activation of external alarm devices. When the actual gas concentration exceeds the alarm levels, the instrument will activate the appropriate alarm relay and display an according message. A relay will also be activated in case of an instrument fault.

1.2 Operating States

There are four different operating states for the Satellite XT, Monitoring Mode, Maintenance Mode, Warning Condition, and Diagnostics. Depending on the selected operating state, the green status LED is either on, off, or flashing.

1.2.1 Monitoring Mode

The Monitoring Mode is the instrument's standard operating mode.

The green LED located above the <set> key is on.

In the Monitoring Mode, the instrument continuously monitors for hazardous gas concentrations and checks for alarm levels and instrument faults.

The instrument's self-diagnostics provide on-line preventive maintenance information identifying electronics or sensor problems. For example a sensor selftest is performed every 24 hours. The sensor selftest is not available with instruments using oxygen sensors or catalytic sensors.
1.2.1.1 Alarm Level Settings

The settings for Alarm Level 1 and Alarm Level 2 are automatically loaded when installing the sensor. Standard settings are 1x and 2x TLV or 20 and 40 % LEL for the target gas. The Alarm Setup function in the Configuration Menu allows the user to change the alarm levels as required.

Whenever the concentration of the target gas exceeds the factory or user programmed alarm levels, the instrument will document this concentration alarm condition on its LCD display and transmit an according message to the network.

Instruments with relay option will additionally trigger the associated alarm relays.

1.2.1.2 Reset Alarms Function

Ex factory, Alarm 1 and Alarm 2 are preprogrammed "enabled" and "latching". In the event of a concentration alarm, the alarm indication with latching alarms will continue until the alarm is manually acknowledged by actuating the <set> key. If the password protection is enabled, the password must be entered (see Configuration Menu / Security Function).

Alarm Reset is not possible, if the alarm condition is still present.

1.2.1.3 Exiting the Monitoring Mode

Exiting the Monitoring Mode and entering the Maintenance Mode may be password protected. To prevent the instrument from manipulations by unauthorized personnel, it is recommended to enable this function (see Configuration Menu / Security Function).

- **Password enabled:**
  Actuate the <esc> key to exit the Monitoring Mode and enter the password. The screen to enter the password is shown for one minute. During this period the Monitoring Mode remains active in the background. When the correct password has been entered, the instrument is in the Maintenance Mode, it is not monitoring, and the green LED is off.

- **Password disabled:**
  Actuate the <esc> key to exit the Monitoring Mode. The instrument is now in the Maintenance Mode, the instrument is not monitoring, and the green LED is off.

1.2.2 Maintenance Mode

The Maintenance Mode indicates a complete absence of monitoring capability. The green status LED is off. A maintenance message is transmitted to the communication network.

Instruments with relay option additionally trigger the fault relay, depending on the configuration.

1.2.3 Warning Condition

A warning condition indicates that the instrument requires some attention, but is still able to monitor and operate as programmed.

The following will occur when the instrument detects a warning condition:
- the green status LED is flashing
- a warning message is transmitted to the communication network; depending on the configuration, this function can be enabled or disabled.
- depending on the configuration, the fault relay will be activated (only instruments with relay option)

1.2.3.1 Reset Warning Condition

Press the <set> key to acknowledge and reset a Warning Condition. Refer to Section 7, Troubleshooting for specific warnings.
1.2.4 Diagnostics

Instrument faults refer to a problem which prevents the Satellite XT from operating properly and interferes with the ability to monitor or document concentration alarms. When the instrument has detected an instrument fault, a fault message is transmitted to the communication network and the fault relay is activated (only instruments with relay option). The green status LED is off. The LCD display is flashing while indicating the specific fault message.

The Satellite XT lists specific instrument responses to instrument faults. For information on the various fault messages and instructions on how to correct a fault condition, please refer to section 7, Troubleshooting.

1.3 Menu structure

Besides the Monitoring Mode, there is also menu operation for the Satellite XT. Menu operation comprises three groups of functions, maintenance, calibration, and configuration. A password (if enabled) must be entered to exit the Monitoring Mode and to obtain access to the Main Menu.

1.3.1 Maintenance Menu

This function covers the realtime service procedures required for a regular maintenance of the instrument (e.g. sensor replacement).

1.3.2 Calibration Menu

Use the calibration function to dynamically calibrate the Satellite XT with a known concentration of the target gas or manually by entering a new correction K-Factor.

1.3.3 Configuration Menu

Use this function to configure the Satellite XT and to program instrument and monitoring parameters to suit individual requirements.

!! Note: If the instrument was in the Monitoring Mode when last powered down, it will automatically return to the Monitoring Mode when power is restored.
1.4 Operational Elements

Located at the front of the Satellite XT is
- the graphic display,
- the keypad consisting of six keys,
- the green status LED above the Set Key.

1.4.1 Keypad Functions

- Escape Key <esc>
- Set Key <set>
- 4 Cursor Keys marked with an arrow, <up>, <down>, <left>, <right>.

In the Maintenance, Calibration, and Configuration Menu, these keys provide the following functions:
To move forwards and backwards in the menu, use the cursor keys <down> and <up>. Select a function by actuating the <set> key.
To enter text or figures, use the cursor keys <left> and <right> to reach the desired cursor position. Use the cursor keys <up> and <down> to select the letter, figure, or sign you wish to enter. Bring the cursor to the next position, select the next letter, figure, or sign. After entering the complete text, use the <set> key to confirm the changes. If you do not want to save the changes, abort by actuating the <esc> key.

1.4.2 Graphic Display

Depending on the operating mode the structure of the graphic display is different. Three basic versions are illustrated and explained below. A detailed description is given in the according sections.

Display Structure for Monitoring Mode

Line 1 offers the possibility to enter a user specific description, e.g. monitoring location (max. 13 spaces; the name of the instrument is entered here when delivered). Line 2 shows the name of the gas monitored. Line 3 indicates the actual gas concentration and the concentration unit. Gas name and concentration unit are data stored in the memory of the sensor installed.

Display Structure for Menu

Line 1 shows the actual position in the menu. In the left example the actual position is Main Menu, in the right example it is the submenu Maintenance. Line 2 shows one of the selection possibilities. Line 3 shows the number of the selection possibility presently displayed and indicates also the total of selection possibilities available in this menu.

! Note:
The number of selection possibilities is subject to the instrument version and may be different than indicated in this guide to operation.
1.5 Technical Specifications

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<td>12 ... 24 VDC</td>
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</tr>
<tr>
<td></td>
<td>(18 VDC minimum</td>
<td>max. 1.4 W</td>
</tr>
<tr>
<td></td>
<td>when using the</td>
<td>max. 0.9 W</td>
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<td></td>
<td>78 kBit per second</td>
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<tr>
<td></td>
<td>wiring topologies</td>
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<td>free, e.g. bus, star, loop, or mixed</td>
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<td></td>
<td>relay contacts</td>
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<td>contacts 3 x SPST (Single-Pole Single-Throw)</td>
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<tr>
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<td>5.7 x 3.7 x 2.0 inches</td>
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<tr>
<td>weight</td>
<td>480 g 650 g 520 g</td>
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<td>17 oz 23 oz 18 oz</td>
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<td>-20 °C ... +40 °C</td>
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<td>-4 °F ... +104 °F</td>
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<td></td>
<td>pressure</td>
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<td>700 ... 1300 hPa</td>
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<td>humidity</td>
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<td>20 ... 90 % r.h.</td>
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This section explains installation and initial start-up procedures.
2.1 General Guidelines

Please consider the aspects indicated below before locating the instrument.

The property of the target gas (lighter or heavier than air) must be considered. The instrument should be mounted as close to the monitoring location as possible and should be easily accessible for operation and maintenance. For narrow monitoring locations or duct mounting a sensor extension with a standard length of 2m (6 feet) is available as an option.

The optimum position to mount the instrument is in an upright position on a flat surface. If the instrument is used for ambient air monitoring, ensure that the sensor is facing downwards. For personal monitoring applications the instrument should be mounted at head level.

Ensure that the area immediately surrounding the instrument is free from objects that might hinder free flow of air. The instrument should be installed away from any possible liquid sources, extreme dust and dirt sources and should be protected against rain and sunlight. An instrument version protection class IP 65 is available for outdoor applications.

A junction box is recommended to connect the instrument to external control systems. A distance of 2 m (6 feet) must not be exceeded.

Regarding the power requirements and operating conditions, please follow the specifications indicated in Section 1, Technical Specifications, for wiring instructions refer to Section 2, Wiring.

Sensors should be stored in a cool, dry place when not in use.

2.2 Standard Mounting

The instrument is designed for DIN–rail mounting. The mounting rail standard shipped with each instrument is used for wall mounting. Mount the DIN–rail to a wall and fasten the instrument with the sensor downwards and the display facing the front.

Attach the wires to the junction box according to the wiring diagram provided in the course of this section.

Mounting rail standard (P/N 9602.0050.10.03)
For applications where wall mounting is not possible, an L-shaped mounting plate with DIN–rail is available as an option.

L-shaped mounting plate with DIN–rail (P/N 9602.0051.10.02)

! Note:
Do not apply power until system is ready for start-up!
2.3 Duct Mounting

Observe the guidelines for installation of the instrument. For assembly and installation of the sensor extension see the schematics below and overleaf.

2.3.1 Connecting the Sensor Extension to the Instrument

1. Connect the Socket (A) to the plug in the sensor compartment located at the bottom of the Satellite XT. The groove of the Socket must face to the front.

2. Screw in the Internal Cap (B) and fasten it hand-tight.

3. Insert the Sensor Housing (C) with the nose of the Bayonet Catch facing to the front. Lock the Bayonet Catch with a quarter-turn right.
### 2.3.2 Mounting the Sensor Extension to the Duct

Duct

*) Duct Mounting Saddle Assembly various types available, see spare parts list, Section 8, Reference Information

---

[Diagram showing mounting details and parts list]

---

**Installation and Start-Up - Section 2**

Satellite XT FTT Versions 2-4
2.4 Network Wiring

For network wiring the 4-wire shielded cable extending from the bottom of the instrument is used. This cable has a length of 2 meters.

The 4-wire shielded cable is required to power the instrument and to interface with additional control devices. The open end of the cable should be terminated in a junction box.

To interface with additional control devices, a 4-wire shielded cable, 2x2x1.0 mm\(^2\) / 17 AWG, is required.

<table>
<thead>
<tr>
<th>Junction Box Terminals</th>
</tr>
</thead>
<tbody>
<tr>
<td>N+ white</td>
</tr>
<tr>
<td>N– brown</td>
</tr>
<tr>
<td>P+ green</td>
</tr>
<tr>
<td>P– yellow</td>
</tr>
<tr>
<td>S shield</td>
</tr>
</tbody>
</table>

Junction Box 2 nodes, standard
2.5 Relay Wiring

Instruments with relay option have an additional 6-wire shielded cable extending from the bottom of the instrument. This cable has a length of 3 meters and is also permanently attached to the instrument.

The 6-wire shielded cable is used for relay wiring and provides a pair of connections for each of the 3 internal relays for activation of visual or audible external alarm devices.

<table>
<thead>
<tr>
<th>Relay Contacts</th>
<th>Color</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 white</td>
<td>Alarm 1 Relay</td>
<td></td>
</tr>
<tr>
<td>1 brown</td>
<td>Alarm 1 Relay</td>
<td></td>
</tr>
<tr>
<td>2 green</td>
<td>Alarm 2 Relay</td>
<td></td>
</tr>
<tr>
<td>2 yellow</td>
<td>Alarm 2 Relay</td>
<td></td>
</tr>
<tr>
<td>3 grey</td>
<td>Fault Relay</td>
<td></td>
</tr>
<tr>
<td>3 pink</td>
<td>Fault Relay</td>
<td></td>
</tr>
<tr>
<td>S shield</td>
<td>cable shield</td>
<td></td>
</tr>
</tbody>
</table>

Junction Box 1 node, R-version for instruments with relay option.

! Note:
All wiring for the Satellite XT and its related equipment must be in compliance with any local electrical and fire codes. The Satellite XT wiring must be kept away from any high power lines. All shielding for the wiring must be connected together and grounded at only one point in the system.
Installation and Start-Up - Section 2

Wiring Diagram Satellite XT FTT and FTT/R - Basic Configuration

Wiring Diagram Satellite XT - Typical Configuration
2.6 Initial Start-Up

When wiring is completed, a sensor must be assigned to each instrument. Every sensor is gas calibrated and these sensor specific calibration parameters are stored in its integrated data memory. Make sure to use only sensors designed for use with the Satellite XT.

Ex factory the instruments are shipped either unconfigured or already preconfigured according to the customer's specifications.

If the instruments are preconfigured, a certain sensor, which can be identified by its serial number printed on the packaging and the sensor label, is assigned and documented to one particular instrument. These data are stated in the test certificate provided with the shipment.

Switch on power supply. If no sensor is fitted, the display of the instrument shows the below message.

```
---- FAULT ----
--- NO SENSOR ! ---
```

For applications without sensor extension open the bayonet catch of the sensor housing located at bottom of the instrument with a quarter-turn left and remove the sensor housing. For applications with sensor extension hold the plastic fitting at the duct side with two fingers and unscrew the metal fitting.

Take the assigned sensor out of the packaging. Remove shorting strap or wire link placed in the sensor plug before inserting it into the instrument. Not all sensors types require this strap or link.

**Caution: Failure to remove the shorting strap or wire link may result in damage to the Satellite.**

For applications without sensor extension insert the sensor into the instrument's sensor compartment with the arrow printed on the sensor label facing upwards and to the front. Fit sensor housing by fastening the bayonet catch with a quarter-turn right.

For applications with sensor extension insert the sensor into the socket inside the metal fitting, properly aligning notch, groove, and arrow printed on the sensor label.

A sensor warm-up is performed and the graphic display shows the according screen until the displayed value is zero. This does not apply for oxygen sensors.

The warm-up time required depends on the type of sensor installed. The instrument is in the Maintenance Mode and the green LED is off.

```
SENSOR WARM-UP !
1.23 ppm
```

```
Satellite XT
AsH3
0.00 ppm
```

As soon as the displayed value reads zero, the instrument automatically switches to the Monitoring Mode. The graphic display shows the according screen, the green status LED is on, the instrument is monitoring.

**! Note:**
If the instrument does not perform as described above and a fault message is shown, please refer to Section 7, Troubleshooting.

**Instruments with catalytic sensors:**
Zero Adjustment must be performed prior to start-up. It is recommended to repeat Zero Adjustment every 4 to 6 weeks. For details refer to Section 5, Calibration.

**Instruments with oxygen sensors:**
Span Adjustment must be performed prior to start-up. It is recommended to repeat Span Adjustment every 4 to 6 weeks. For details refer to Section 5, Calibration.
This section explains the different monitoring conditions and the submenus available under the Main Menu.

3.1 The Main Menu Screens

When the <esc> key is actuated, the instrument will leave the Monitoring Mode and go to the Main Menu. The instrument is now in the Maintenance Mode and the green LED is off. Actuate the cursor keys <up> or <down> to move forwards and backwards in the Main Menu. Actuate the <set> key to select a submenu. Actuate the <esc> key to go back to the Main Menu.

To return to the Monitoring Mode, go to the menu ‘MONITORING’ and actuate <set> to select. The display shows the monitoring screen again and the illuminated green LED indicates, that the instrument is in the Monitoring Mode.
Main Menu - Monitoring

The instrument is in the operating mode. Maintenance and the green LED is off. Actuate the cursor keys <up> or <down> to move forwards and backwards in the Main Menu. Actuate the <set> key to enter the Monitoring Mode.

<Normal Condition>
This screen and the illuminated green LED indicate that the instrument is in the Monitoring Mode and is operating properly.

<Alarm 1 Condition>
This screen shows that Alarm Level 1 has been exceeded and that there is an actual gas concentration of 0.07 ppm AsH3.
(f.i. Alarm 1 set at 0.05 ppm AsH3)

<Alarm 2 Condition>
This screen shows that Alarm Level 2 has been exceeded and that there is an actual gas concentration of 0.12 ppm AsH3.
(f.i. Alarm 2 set at 0.10 ppm AsH3)
Main Menu - Maintenance

The instrument is in the Maintenance Mode and the green LED is off. Actuate the cursor keys <up> or <down> to move forwards and backwards in the Main Menu. To select a submenu, actuate the <set> key to enter.

Submenus - Maintenance

- Sensor Service
  - screen 1 of 7
- Alarm Reset
  - screen 2 of 7
- Alarm / Warn Test
  - screen 3 of 7
- Device Infos
  - screen 4 of 7
- Sensor Infos
  - screen 5 of 7
- Reset Device
  - screen 6 of 7
- Service
  - screen 7 of 7
The instrument is in the Maintenance Mode and the green LED is off.
Actuate the cursor keys <up> or <down> to move forwards and backwards in the Main Menu.
To select a submenu, actuate the <set> key to enter.

Main Menu - Calibration

Submenus - Calibration

Gas Calibration
screen 1 of 2

Manual K-Factor
screen 2 of 2
The instrument is in the Maintenance Mode and the green LED is off. Actuate the cursor keys <up> or <down> to move forwards and backwards in the Main Menu. To select a submenu, actuate the <set> key to enter.

**Submenus - Configuration**

- **Alarm Settings**
  - screen 1 of 10

- **Language**
  - screen 2 of 10

- **Date Format**
  - screen 3 of 10

- **Auto Selftest**
  - screen 4 of 10
  - ! This function is not available with instruments using oxygen sensors or catalytic sensors.

- **Security**
  - screen 5 of 10

- **Password**
  - screen 6 of 10
! This submenu is only available for instruments with relay option.
This section explains routine maintenance procedures including sensor replacement and specific information on sensor and instrument.

**Main Menu - Maintenance**
The instrument is in the Maintenance Mode and the green LED is off. Actuate the cursor keys <up> or <down> to move forwards and backwards in the Main Menu. To select a submenu, actuate the <set> key to enter.

**Submenus - Maintenance**

- **Sensor Service** screen 1 of 7
- **Alarm Reset** screen 2 of 7
- **Alarm / Warn Test** screen 3 of 7
- **Device Infos** screen 4 of 7
- **Sensor Infos** screen 5 of 7

continued
Maintenance - Section 4

Main Menu - Maintenance

Submenus - Maintenance

Reset Device
screen 6 of 7

Service
screen 7 of 7

continued
**Sensor Service**
To perform a sensor replacement with a new sensor, which must have the same part number. See section 8 for sensor information.
Use the <set> key to enter and follow the dialogue displayed at the bottom line of the screen.
When the instrument has finished the sensor service procedure, it will automatically enter the Monitoring Mode.

**Remove Sensor**
Remove the sensor presently installed and actuate the <set> key to proceed.

**Replacement**
Insert the new sensor and actuate the <set> key to continue.

**Load New Data ?**
If you want the data of the new sensor to be loaded, confirm this by actuating the <set> key.

**Loading Data !**
The new data are now loaded from the sensor into the unit's internal memory.

**<Sensor Warm-Up Condition>**
A sensor warm-up is performed and this screen is shown until the displayed value is zero.
This does not apply for oxygen sensors.
The warm-up time required depends on the type of sensor.

**<Normal Monitoring Condition>**
The instrument will automatically switch to the Monitoring Mode when the sensor service procedure is finished.
Only instruments with catalytic sensors:
If the displayed value is not zero, a zero adjustment must be performed; refer to section 5, Calibration.

!Note:
When a new sensor is installed the K-factor will automatically revert to the default value 1.00.
If individual settings are required, they must be entered again; refer to section 5, Calibration.
Catalytic sensors are calibrated for methane. When monitoring for other combustible gases, a K-factor must be entered.
**Alarm Reset**

Alarm Reset allows the user to reset the alarm indication of latched alarms. An according message is sent to external alarm devices. Use the <set> key to enter and follow the dialogue displayed at the bottom of the screen. Actuate the <esc> key to exit.

**Alarms Off ?**

Actuate the <set> key to confirm the reset of alarm indication with latching alarm. For non-latching alarms, alarm indication will be reset automatically.

**Alarm/Warn Test**

Used to verify the alarm function of any associated external device by simulating an Alarm 1, Alarm 2, and warning condition. Use the <set> key to select or use the cursor keys <up> and <down> to continue in the menu.

**Set Alarm 1 ?**

Allows the user to simulate an Alarm 1 condition. Actuate the <set> key to enter.

**Alarm 1 set !**

An Alarm 1 message is transmitted to the network. Instruments with relay option: the according relay is activated. Use the <esc> key to exit.

**Set Alarm 2 ?**

Allows the user to simulate an Alarm 2 condition. Actuate the <set> key to enter.

**Alarm 2 set !**

An Alarm 2 message is transmitted to the network. Instruments with relay option: the according relay is activated. Use the <esc> key to exit.

continued
**Alarm/Warn Test**

**Set Warning?**
Allows the user to simulate a warning condition. Actuate the <set> key to enter.

**Warning set!**
A warning message is transmitted to the network. Instruments with relay option: the according relay is activated. Use the <esc> key to exit.

**Device Infos**

**Actual Software Version**
The version of the software presently installed is shown.

**Specific Identification Number**
The instrument’s specific ID identification number is shown.
Provides specific information about the sensor presently installed, i.e. part number, serial number, date of first calibration, sensitivity, and revision number. These data are stored in the sensor’s memory. Actuate the <set> key to select or use the cursor keys <up> and <down> to continue in the menu.

**Sensor Infos**

**Part Number**
Actuate the <set> key to display the part number of the sensor presently installed.

**Serial Number**
Actuate the <set> key to display the serial number of the sensor presently installed.

**First Calibration**
Use the <set> key to display the date when the installed sensor was calibrated for the first time.

---

**SENSOR INFOS**

**PART NUMBER**
Actuate the <set> key to display the part number of the sensor presently installed.

**SERIAL NUMBER**
Actuate the <set> key to display the serial number of the sensor presently installed.

**1st CALIBRATION**
Use the <set> key to display the date when the installed sensor was calibrated for the first time.

---

**<Actual Sensor Part Number>**
Use this information to order replacement sensors.
Additional order information is provided in Section 8, Sensor Order Information.
Actuate <esc> to leave.

**<Actual Sensor Serial Number>**
This information may be required for service purposes.
Actuate the <esc> key to leave.

**<Date of First Calibration>**
This information may be required for service purposes and to check the age of the sensor.
Actuate <esc> to leave.
Sensor Infos

**Sensitivity**

Use the <set> key to display the sensor sensitivity determined during the first calibration.

**<Actual Sensitivity>**

This information may be required for service purposes. Actuate the <esc> key to leave.

**Revision Number**

Use the <set> key to display the revision number of the gas related information stored in the sensor’s memory.

**<Actual Revision Number>**

This information may be required for service purposes. Actuate the <esc> key to leave.
Reset Device

Offers the possibility to perform a "warm start" of the instrument. Actuate the <set> key to select.

Are You Sure?

This screen is to confirm that a software reset should be performed. Actuate the <set> key to confirm or use the <esc> key to exit.

Sensor Warm-Up Condition

A sensor warm-up is performed and this screen is shown until the displayed value is zero, except for Oxygen sensors. The warm-up time depends on the type of sensor.

<Normal Monitoring Condition>

The instrument will automatically switch to the Monitoring Mode when the sensor service procedure is finished.

Service

This submenu is used exclusively by trained Service Personnel. The functions are password protected.
This section describes calibration procedures for the Satellite XT. Calibration can be performed either automatically by a dynamic gas calibration or manually by entering a calculated correction factor called K-factor.

**Main Menu - Calibration**

The instrument is in the Maintenance Mode and the green LED is off. Actuate the cursor keys <up> or <down> to move forwards and backwards in the Main Menu. To select a submenu, actuate the <set> key to enter.

**Submenus - Calibration**

- **Gas Calibration**
  - Screen 1 of 2

- **Manual K-Factor**
  - Screen 2 of 2

!Note:

If a high degree of accuracy in monitoring is required, monthly calibration with calibration gas of a known concentration is recommended.

When performing a dynamic calibration, a new correction factor (K-Factor) is calculated automatically. The actual value can be displayed in the submenu Manual K-Factor.

Use appropriate safety precautions when handling toxic or corrosive gases and properly vent, if possible.

**Instruments with CATALYTIC sensors:**
Zero Adjustment must be performed prior to start-up. It is recommended to repeat Zero Adjustment every 4 to 6 weeks.

Catalytic sensors must be protected from silicone vapours, which may permanently reduce the sensor’s sensitivity.

**Instruments with OXYGEN sensors:**
Span Adjustment must be performed prior to start-up. It is recommended to repeat Span Adjustment every 4 to 6 weeks.
Gas Calibration

The gas calibration submenu is used for dynamic calibration. For zero adjustment use clean or synthetic air free from measuring gas or any other interfering gases. The sensor must be warmed-up before calibration.

For span adjustment it is recommended to use test gas of a known concentration at or slightly above TLV for the target gas. **Always keep to the correct sequence, first perform zero adjustment, then Span Adjustment.**

**Zero Adjust**

Zero adjustment applies for all sensors except oxygen sensors.

Use the <set> key to enter and follow the dialogue displayed.

**Apply Air !**

Apply clean or synthetic air to the sensor and actuate the <set> key to continue.

**<Actual Zero Point>**

Allow the zero reading to stabilize.

If the reading is already zero, zero adjustment is not necessary. Actuate the <esc> key to exit.

If the reading is not zero, actuate the <set> key to re-adjust the zero point and to continue the procedure.

**<Re-adjusted Zero Point>**

The reading is zero. Actuate the <set> key to proceed.

**Save ?**

Actuate the <set> key to save the new zero point and store it in the unit’s internal memory.
Gas Calibration

Span Adjust

Span adjustment applies for all sensors, including oxygen sensors. Use the <set> key to enter and follow the dialogue displayed.

<Actual Calibration Gas>

The instrument shows which calibration gas is required for the actual sensor type.

<Actual Concentration for Calibration>

The recommended concentration for span adjustment is displayed. Default value is TLV concentration for the target gas, 20 % LEL for catalytic sensors. When using calibration gas of a different concentration, change the value accordingly. After the new value has been entered, actuate the <set> key to continue.

Apply Gas!

Place the calibration cap over the sensor and start the calibration gas flow (18 l/h or 300 ccm/min). Actuate the <set> key to continue.

<Actual Span Value>

Allow the reading to stabilize. If the reading matches the concentration of the calibration gas, span adjustment is not necessary. Actuate the <esc> key to exit. If the reading does not match the concentration of the calibration gas, actuate the <set> key to re-adjust the span value and to continue the procedure.

<Re-adjusted Span Value>

The reading matches the concentration of the calibration gas. Actuate the <set> key to proceed.

Save?

Actuate the <set> key to save the new span value and store it in the unit's internal memory.

Remove Gas!

Stop the calibration gas flow. Remove gas and calibration cap. Allow several minutes for the sensor to clear.
This submenu is used to manually calibrate the instrument by entering a new K-Factor. This factor is a multiplication or correction value used to calibrate the response of the instrument to a specific gas concentration. The factory default K-Factor for all gases is 1.00. Use the <set> key to enter. The instrument will display the actual K-Factor.

**<Actual K-Factor>**

Use the cursor keys <left> or <right> to reach the desired position. Use the cursor keys <up> and <down> to select the figures you wish to enter. The K-Factor must be in the range of 0.20 and 5.00. After a new value has been entered, actuate the <set> key to confirm or <esc> to exit.

---

**Note:**

Individual settings for the Manual K-Factor will automatically revert to the default value 1.00, whenever the sensor is replaced by a new sensor.

**Only instruments using catalytic sensors:**

Catalytic sensors are calibrated for methane. When monitoring for other combustible gases, a K-factor must be entered.
This section describes the instrument’s default configuration and procedures how to adapt it to individual requirements.

**Main Menu - Configuration**

The instrument is in the Maintenance Mode and the green LED is off. Actuate the cursor keys <up> or <down> to move forwards and backwards in the Main Menu. To select a submenu, actuate the <set> key to enter.

**Submenus - Configuration**

- **Alarm Settings**
  - screen 1 of 10

- **Language**
  - screen 2 of 10

- **Date Format**
  - screen 3 of 10

- **Auto Selftest**
  - screen 4 of 10
  
  ! This function is not available with instruments using oxygen sensors or catalytic sensors.

- **Security**
  - screen 5 of 10
This submenu is only available for instruments with relay option.
Alarm Settings

Allows the user to enter or change various settings for Alarm 1 and Alarm 2 activation. Use the <set> key to enter.

Alarm 1
For Alarm 1 settings, use the <set> key to enter or continue in the menu with the cursor keys <up> or <down>.

Alarm 2
For Alarm 2 settings, use the <set> key to enter or continue in the menu with the cursor keys <up> or <down>.
Alarm 1

Allows the user to configure all parameters for Alarm 1 (lower alarm level) activation.

Alarm 1 State

Used to enable / disable the Alarm 1 activation.

Alarm 1 Level

Used to set individual alarm levels for Alarm 1 activation.

Alarm 1 Trigger

Used to define the trigger condition for Alarm 1 activation.

Alarm 1 Latch

Used to define the Alarm 1 activation to be latching or non-latching.
Configuration - Section 6

**Alarm 1 State**

Used to enable / disable the Alarm 1 activation. Default setting is enabled. Use the <set> key to enter. The instrument will show the actual setting.

**Disabled**

Allows the user to turn off the Alarm 1 activation. Actuate the cursor keys <up> or <down> to change. Actuate the <set> key to confirm or <esc> to exit.

**Enabled**

Allows the user to turn on the Alarm 1 activation. Actuate the cursor keys <up> or <down> to change. Actuate the <set> key to confirm or <esc> to exit.

**Alarm 1 Level**

Used to set individual alarm levels for Alarm 1 activation. Default setting is 1 x TLV respectively 20 % LEL for the target gas. Actuate the <set> key to enter and show the actual setting.

**<Actual Alarm 1 Level>**

To change the value, use the cursor keys <left> or <right> to reach the desired position. Use the cursor keys <up> and <down> to select the figures you wish to enter. After the new value has been entered, actuate the <set> key to confirm or <esc> to exit.
Alarm 1 Trigger

Used to define the trigger condition for Alarm 1 activation. Default setting is Greater Than. Use the <set> key to enter. The instrument will show the actual setting.

Greater Than

Defines that an Alarm 1 condition will be indicated when the actual gas concentration exceeds the preset level for Alarm 1.
Actuate the cursor keys <up> or <down> to change.
Actuate the <set> key to confirm or <esc> to exit.

Less Than

Defines that an Alarm 1 condition will be indicated when the actual gas concentration falls below the preset level for Alarm 1.
Actuate the cursor keys <up> or <down> to change.
Actuate the <set> key to confirm or <esc> to exit.

Alarm 1 Latch

Used to define the Alarm 1 activation to be either latching or non-latching. Default setting is enabled. Use the <set> key to enter. The instrument will show the actual setting.

When latching is enabled, alarm reset must be done manually. Nonlatching alarms will be reset automatically, upon correction of the alarm condition.

Disabled

Defines the Alarm 1 activation to be non-latching. Actuate the cursor keys <up> or <down> to change. Actuate the <set> key to confirm or <esc> to exit.

Enabled

Defines the Alarm 1 activation to be latching. Actuate the cursor keys <up> or <down> to change. Actuate the <set> key to confirm or <esc> to exit.
## Alarm 2

Allows the user to configure all parameters for Alarm 2 (upper alarm level) activation.
For all subsequent Alarm 2 settings, please follow the procedures described in the corresponding section for Alarm 1 settings.

### Alarm 2 State

Used to enable / disable the Alarm 2 activation.

### Alarm 2 Level

Used to set individual alarm levels for Alarm 2 activation.

### Alarm 2 Trigger

Used to define the trigger condition for Alarm 2 activation.

### Alarm 2 Latch

Used to define the Alarm 2 activation to be latching or non-latching.
Language

Used to select the desired language for menu operation. Default setting is English. Use the <set> key to enter. The instrument will display the actual language.

German

Actuate the cursor keys <up> or <down> to change. Actuate the <set> key to confirm or <esc> to exit.

English

Actuate the cursor keys <up> or <down> to change. Actuate the <set> key to confirm or <esc> to exit.

Date Format

Used to define the format how to display the date (only used in the submenu Sensor Infos, Date of First Calibration). Default setting is International. Use the <set> key to enter. The actual date format is displayed.

International

International date format is DD.MM.YYYY Actuate the cursor keys <up> or <down> to change. Actuate the <set> key to confirm or <esc> to exit.

USA

USA date format is MM-DD-YYYY Actuate the cursor keys <up> or <down> to change. Actuate the <set> key to confirm or <esc> to exit.
Auto Selftest

The instrument's self-diagnostics provides an on-line preventive sensor selftest performed automatically every 24 hours, which may be enabled or disabled. Default setting is enabled. The Auto Selftest function is not applicable for Oxygen sensors. Use the <set> key to enter. The display will show the actual setting.

! The function Auto Selftest is not available with instruments using oxygen sensors or catalytic sensors.

Disabled

Allows the user to turn off the Auto Selftest. Actuate the cursor keys <up> or <down> to change. Actuate the <set> key to confirm or <esc> to exit.

Enabled

Allows the user to turn on the Auto Selftest. Actuate the cursor keys <up> or <down> to change. Actuate the <set> key to confirm or <esc> to exit.

Security

Exiting the Monitoring Mode and entering the Maintenance Mode, may be password protected, to prevent the instrument from manipulations by unauthorized personnel. Ex factory the password protection is disabled. Use the <set> key to enter. The instruments shows the actual setting.

Password On

Allows the user to enable the password protection. Actuate the cursor keys <up> or <down> to change. Actuate the <set> key to confirm or <esc> to exit.

Password Off

Allows the user to disable the password protection. Actuate the cursor keys <up> or <down> to change. Actuate the <set> key to confirm or <esc> to exit.
**Password**

Allows the user to enter or change the password. Ex factory the password is <000>. Use the <set> key to enter. The instrument will display the actual password.

**<Actual Password>**

To change the password, use the cursor keys <left> or <right> to reach the desired position. Use the cursor keys <up> and <down> to select the figures you wish to enter. After the new password has been entered, actuate the <set> key to confirm or <esc> to exit.

**Location**

Allows the user to enter a description defining the monitoring point. Ex factory it reads <Satellite XT>. Up to 13 alphanumeric characters can be entered. Use the <set> key to enter. The instrument will display the actual location.

**<Actual Location>**

Use the cursor keys <left> or <right> to reach the desired position. Use the cursor keys <up> and <down> to select the characters you wish to enter. When the new location has been entered completely, actuate the <set> key to confirm or <esc> to exit.
New Sensor Type

Allows the user to configure the instrument for a new sensor type with a part number, which is different from the one presently used. See Section 8 for Sensor Information. Actuate the <set> key to enter and follow the dialogue displayed.

Remove Sensor

Remove the sensor presently installed and actuate the <set> key to proceed.

New Sensor

Insert the new sensor and actuate the <set> key to proceed.

Load New Data?

If you want the data of the new sensor to be loaded, confirm this by pressing the <set> key.

Loading Data!

The new data are now loaded from the sensor into the instrument's internal memory.

Gas Name

Allows the user to enter a different gas name than the one stored in the sensor's data memory. Up to 7 alpha-numeric characters can be entered. Use the <set> key to enter. The instrument will display the actual gas name.

<Actual Gas Name>

Use the cursor keys <left> or <right> to reach the desired position. Use the cursor keys <up> and <down> to select the characters you wish to enter. When the new gas name has been entered completely, actuate the <set> key to confirm or <esc> to exit.
Relays

Allows the user to enter or change various settings for the internal relay contacts for Alarm 1, Alarm 2, and Fault. Use the <set> key to enter.

!The RELAYS menu and all subsequent menu items are only available for instruments with relay option.

<table>
<thead>
<tr>
<th>Configuration - Section 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>RELAYS</td>
</tr>
<tr>
<td>select: 10 of 10</td>
</tr>
</tbody>
</table>

Relay State

Used to individually define the relays to be either deenergized (normally open contact) or energized (normally closed contact).

Use the <set> key to enter or continue in the menu with the cursor keys <up> or <down>.

| RELAYS                     |
| vELAY STATE                |
| select: 1 of 3             |

Alarm Delay

Used to set a delay for the relay activation in case of concentration alarms.

Use the <set> key to enter or continue in the menu with the cursor keys <up> or <down>.

| RELAYS                     |
| ALARM DELAY                |
| select: 2 of 3             |

Fault Trigger

Used to define the trigger conditions for activation of the Fault Relay.

Use the <set> key to enter or continue in the menu with the cursor keys <up> or <down>.

| RELAYS                     |
| FAULT TRIGGER             |
| select: 3 of 3             |
Relay State

Used to individually define the Alarm 1, Alarm 2, and Fault Relay to be either deenergized (normally open contact) or energized (normally closed contact).

Ex factory the relays are deenergized (normally open contacts).

Use the <set> key to enter.

Alarm 1 Relay

Allows to set the Alarm 1 Relay state.

Alarm 2 Relay

Allows to set the Alarm 2 Relay state.

Fault Relay

Allows to set the Fault Relay state.

Alarm 1 Relay

Allows the user to set the Alarm 1 Relay state.

Use the <set> key to enter.

The instrument will show the actual setting.

Deenergized / NO

Defines the Alarm 1 Relay to be deenergized (normally open contact).

Actuate the cursor keys <up> or <down> to change.

Actuate the <set> key to confirm or <esc> to exit.

Energized / NC
## Configuration - Section 6

### Alarm 1 Relay

- **Deenergized / NO**
  - Defines the Alarm 1 Relay to be deenergized (normally open contact).
  - Actuate the cursor keys <up> or <down> to change.
  - Actuate the <set> key to confirm or <esc> to exit.

- **Energized / NC**
  - Defines the Alarm 1 Relay to be energized (normally closed contact).
  - Actuate the cursor keys <up> or <down> to change.
  - Actuate the <set> key to confirm or <esc> to exit.

### Alarm 2 Relay

- **Deenergized / NO**
  - Defines the Alarm 2 Relay to be deenergized (normally open contact).
  - Actuate the cursor keys <up> or <down> to change.
  - Actuate the <set> key to confirm or <esc> to exit.

### Fault Relay

- Allows to set the Fault Relay state.

### Relay State

<table>
<thead>
<tr>
<th>RELAY STATE</th>
<th>ALARM 1 RELAY</th>
<th>select: 1 of 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>RELAY STATE</td>
<td>ALARM 2 RELAY</td>
<td>select: 2 of 3</td>
</tr>
<tr>
<td>RELAY STATE</td>
<td>FAULT RELAY</td>
<td>select: 3 of 3</td>
</tr>
</tbody>
</table>

- **Fault Relay**
  - Allows to set the Fault Relay state.

- **Alarm 1 Relay**
  - Allows the user to set the Alarm 1 Relay state.
  - Use the <set> key to enter.
  - The instrument will show the actual setting.

- **Deenergized / NO**
  - Defines the Alarm 1 Relay to be deenergized (normally open contact).
  - Actuate the cursor keys <up> or <down> to change.
  - Actuate the <set> key to confirm or <esc> to exit.

- **Energized / NC**
  - Defines the Alarm 1 Relay to be energized (normally closed contact).
  - Actuate the cursor keys <up> or <down> to change.
  - Actuate the <set> key to confirm or <esc> to exit.

- **Alarm 2 Relay**
  - Allows the user to set the Alarm 2 Relay state.
  - Use the <set> key to enter.
  - The instrument will show the actual setting.

- **Deenergized / NO**
  - Defines the Alarm 2 Relay to be deenergized (normally open contact).
  - Actuate the cursor keys <up> or <down> to change.
  - Actuate the <set> key to confirm or <esc> to exit.
Alarm 2 Relay

Allows the user to set the Alarm 2 Relay state.
Use the <set> key to enter.
The instrument will show the actual setting.

Deenergized / NO
Defines the Alarm 2 Relay to be deenergized (normally open contact).
Actuate the cursor keys <up> or <down> to change.
Actuate the <set> key to confirm or <esc> to exit.

Energized / NC
Defines the Alarm 2 Relay to be energized (normally closed contact).
Actuate the cursor keys <up> or <down> to change.
Actuate the <set> key to confirm or <esc> to exit.

Fault Relay

Allows the user to set the Fault Relay state.
Use the <set> key to enter.
The instrument will show the actual setting.

Deenergized / NO
Defines the Fault Relay to be deenergized (normally open contact).
Actuate the cursor keys <up> or <down> to change.
Actuate the <set> key to confirm or <esc> to exit.

Energized / NC
Defines the Fault Relay to be energized (normally closed contact).
Actuate the cursor keys <up> or <down> to change.
Actuate the <set> key to confirm or <esc> to exit.
**Alarm Delay**

Used to define an alarm delay for concentration alarms. Minimum value is 0, maximum setting is 99.9 seconds. Default setting is 3.0 seconds. 

Actuate the <set> key to enter and show the actual setting.

**<Actual Alarm Delay>**

To change the value, use the cursor keys <left> or <right> to reach the desired position. Use the cursor keys <up> and <down> to select the figures you wish to enter. After the new value has been entered, actuate the <set> key to confirm or <esc> to exit.

**Fault Trigger**

Allows the user to define, which fault conditions will activate the Fault Relay. Ex factory the setting is Fault Only. Use the <set> key to enter. The instrument will show the actual setting.

**Fault Only**

Used to configure the Fault Relay to be activated in case of a fault condition only. Actuate the cursor keys <up> or <down> to change. Actuate the <set> key to confirm or <esc> to exit.

**Fault + Warning**

Used to configure the Fault Relay to be activated in case of a fault or warning condition only. Actuate the cursor keys <up> or <down> to change. Actuate the <set> key to confirm or <esc> to exit.

**Fault + Maintenance**

Used to configure the Fault Relay to be activated in case of a fault or maintenance condition only. Actuate the cursor keys <up> or <down> to change. Actuate the <set> key to confirm or <esc> to exit.

**All**

Used to configure the Fault Relay to be activated in case of a fault, warning, or maintenance condition. Actuate the cursor keys <up> or <down> to change. Actuate the <set> key to confirm or <esc> to exit.
This section will help to determine the source of a fault or warning condition and will provide a corrective action.

7.1 Warning and Fault Messages

Warning and Fault are two different kinds of messages, which require different attention.

For any message not explained in this section or any other assistance required, please do not hesitate to contact our service department.

7.1.1 Warnings

A warning condition indicates that the instrument requires some attention, but the instrument is still able to monitor and operate as programmed.

The following will occur when the instrument detects a warning condition:
- the green status LED is flashing
- a warning message is sent to the communication network
- the fault relay is activated, relays and their appropriate configuration provided.

Actuate the <set> key to acknowledge and reset a Warning Condition.

Low Zero!

This message indicates that the zero point of the sensor is out of the optimum range.

To correct this problem, check the zero adjustment and recalibrate, if necessary.

Check Sensor!

This message indicates that the sensor sensitivity does not comply with the specifications. The sensor must soon be replaced.

Whilst most sensors will work for another 2-6 weeks, there are circumstances that may cause an earlier failure of the sensor cell. Honeywell therefore suggests that customers with more critical needs carry out the replacement of the sensor cell within 3 days (72 hours) of receiving the "check sensor" message.

To receive this message, the function Auto Selftest must be configured enabled; refer to Section 6, Configuration.

! This function is not available for instruments with oxygen sensor or catalytic sensor.
7.1.2 Faults

Instrument faults refer to a problem which prevents the instrument from operating properly and interferes with the ability to monitor or document concentration alarms.

When the instrument has detected an instrument fault, a fault message for each different fault condition is sent to the communication network. The green status LED is off and the fault relay is activated. The LCD display is flashing while indicating the specific fault message.

For instruments with relay option the fault relay is activated additionally.

Fault - ADC Not Ready!

This indicates that there is a problem with the internal electronics. The AD Converter has failed. Switch power supply for this unit off and on again. If the instrument still shows this message, switch off power supply for this unit and contact our service department for further instructions.

Fault - No Sensor!

This message indicates that no sensor is or a sensor type not suitable for this instrument is fitted. To eliminate the problem, insert an appropriate sensor. If the instrument is operated with a sensor extension, this fault message may also be caused by a bad connection. Make sure all connections are firmly attached.

Fault - Wrong Sensor!

This message indicates that the sensor installed is not the sensor assigned to this particular instrument. To correct the problem, insert the sensor assigned and documented to this instrument. The data are stated in the test certificate provided with the shipment.

Fault - Replace Sensor!

This message indicates that the sensor presently installed is depleted (the warning CHECK SENSOR! has been ignored). To correct the problem, replace the old sensor immediately.

! This function is not available for instruments with oxygen sensor or catalytic sensor.
Fault - Extractive !

Only for instruments with Extractive Module.
This message indicates that there is a problem with the Extractive Module. Check power supply, sample tubing, sample tubing connections, and sample line filter. Perform any corrective action required.

If the message is still shown, please contact our service department for further instructions.

Fault - Pyrolyzer !

Only for instruments with Pyrolyzer Module.
This message indicates that there is a problem with the Pyrolyzer Module.
Please contact our service department for further instructions.
## 8.1 Sensor Order Information

<table>
<thead>
<tr>
<th>Substance / Sensor</th>
<th>Part No Sensor</th>
<th>Nominal Range</th>
<th>Unit</th>
<th>Note</th>
<th>Dust Filter allowed</th>
</tr>
</thead>
<tbody>
<tr>
<td>AsH₃ Arsine (3 El.)</td>
<td>9602-6004</td>
<td>0 ... 1.00 ppm</td>
<td>ppm</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>AsH₃ Arsine (2 El.)</td>
<td>9602-6000</td>
<td>0 ... 1.00 ppm</td>
<td>ppm</td>
<td>1)</td>
<td>Yes</td>
</tr>
<tr>
<td>AsH₃ Arsine (2 El.)</td>
<td>9602-6002</td>
<td>0 ... 10.0 ppm</td>
<td>ppm</td>
<td>1)</td>
<td>Yes</td>
</tr>
<tr>
<td>B₂H₆ Diborane</td>
<td>9602-6202</td>
<td>0 ... 1.00 ppm</td>
<td>ppm</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>Br₂ Bromine</td>
<td>9602-6800</td>
<td>0 ... 5.00 ppm</td>
<td>ppm</td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>C₄F₆ Hexafluorobutadiene</td>
<td>9602-9732</td>
<td>0 ... 50.0 ppm</td>
<td>ppm</td>
<td>3)</td>
<td>no data</td>
</tr>
<tr>
<td>C₅F₈ Octafluorocyclopentene</td>
<td>9602-9730</td>
<td>0 ... 20.0 ppm</td>
<td>ppm</td>
<td>3)</td>
<td>no data</td>
</tr>
<tr>
<td>CH₃F Methyl Fluoride</td>
<td>9602-9720</td>
<td>0 ... 0.500 % vol</td>
<td>ppm</td>
<td>3)</td>
<td>no data</td>
</tr>
<tr>
<td>CH₄ Methane</td>
<td>9602-9900</td>
<td>0 ... 100 % LEL</td>
<td>ppm</td>
<td>4)</td>
<td>no data</td>
</tr>
<tr>
<td>Cl₂ Chlorine</td>
<td>9602-5300</td>
<td>0 ... 5.00 ppm</td>
<td>ppm</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>ClF₃ Chlorine Trifluoride</td>
<td>9602-7410</td>
<td>0 ... 1.00 ppm</td>
<td>ppm</td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>ClO₂ Chlorine Dioxide</td>
<td>9602-7400</td>
<td>0 ... 1.00 ppm</td>
<td>ppm</td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>CO Carbon Monoxide</td>
<td>9602-5400</td>
<td>0 ... 500 ppm</td>
<td>ppm</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>COCl₂ Phosgene</td>
<td>9602-6600</td>
<td>0 ... 1.00 ppm</td>
<td>ppm</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>DCE 1,2 Di-chloro-ethylene</td>
<td>9602-9600</td>
<td>0 ... 1000 ppm</td>
<td>ppm</td>
<td>3)</td>
<td>no data</td>
</tr>
<tr>
<td>C₂H₄O Ethylene Oxide</td>
<td>9602-8000</td>
<td>0 ... 20.0 ppm</td>
<td>ppm</td>
<td></td>
<td>no data</td>
</tr>
<tr>
<td>F₂ Fluorine</td>
<td>9602-6400</td>
<td>0 ... 5.00 ppm</td>
<td>ppm</td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>F₂ Fluorine</td>
<td>9602-6401</td>
<td>0 ... 30 ppm</td>
<td>ppm</td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>GeH₄ Germane</td>
<td>9602-6902</td>
<td>0 ... 5.0 ppm</td>
<td>ppm</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>H₂ Hydrogen (1%)</td>
<td>9602-5100</td>
<td>0 ... 1.000 % vol</td>
<td>ppm</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>H₂ Hydrogen (4 %)</td>
<td>9602-5101</td>
<td>0 ... 4.00 % vol</td>
<td>ppm</td>
<td>2)</td>
<td>Yes</td>
</tr>
<tr>
<td>H₂S Hydrogen Sulfide</td>
<td>9602-5200</td>
<td>0 ... 100 ppm</td>
<td>ppm</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>H₂S Hydrogen Sulfide (org.)</td>
<td>9602-5201</td>
<td>0 ... 30.0 ppm</td>
<td>ppm</td>
<td>1)</td>
<td>Yes</td>
</tr>
<tr>
<td>H₂Se Hydrogen Selenide</td>
<td>9602-5601</td>
<td>0 ... 5.00 ppm</td>
<td>ppm</td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>HBr Hydrogen Bromide</td>
<td>9602-7000</td>
<td>0 ... 30.0 ppm</td>
<td>ppm</td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>HCl Hydrogen Chloride</td>
<td>9602-5800</td>
<td>0 ... 30.0 ppm</td>
<td>ppm</td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>HCN Hydrogen Cyanide</td>
<td>9602-5700</td>
<td>0 ... 30.0 ppm</td>
<td>ppm</td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>HF Hydrogen Fluoride</td>
<td>9602-6500</td>
<td>0 ... 10.0 ppm</td>
<td>ppm</td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>HMDS Hexamethyldisilazane</td>
<td>9602-6714</td>
<td>0 ... 500 ppm</td>
<td>ppm</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>HMDS Hexamethyldisilazane</td>
<td>9602-6715</td>
<td>0 ... 0.500 % vol</td>
<td>ppm</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>N₂H₄ Hydrazine</td>
<td>9602-7600</td>
<td>0 ... 1.00 ppm</td>
<td>ppm</td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>NF₃ Nitrogen Trifluoride</td>
<td>9602-9700</td>
<td>0 ... 50.0 ppm</td>
<td>ppm</td>
<td>3)</td>
<td>no data</td>
</tr>
<tr>
<td>NH₃ Ammonia (100 ppm)</td>
<td>9602-6704</td>
<td>0 ... 100 ppm</td>
<td>ppm</td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>NH₃ Ammonia (1000 ppm)</td>
<td>9602-6705</td>
<td>0 ... 1000 ppm</td>
<td>ppm</td>
<td>2)</td>
<td>No</td>
</tr>
<tr>
<td>NO Nitric Oxide</td>
<td>9602-7200</td>
<td>0 ... 250 ppm</td>
<td>ppm</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>NO₂ Nitrogen Dioxide</td>
<td>9602-7300</td>
<td>0 ... 25.0 ppm</td>
<td>ppm</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>O₂ Oxygen</td>
<td>9602-5500</td>
<td>0 ... 25.0 ppm</td>
<td>ppm</td>
<td>3)</td>
<td>Yes</td>
</tr>
<tr>
<td>O₃ Ozone</td>
<td>9602-7100</td>
<td>0 ... 1.00 ppm</td>
<td>ppm</td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>O₃ Ozone</td>
<td>9602-7101</td>
<td>0 ... 1.00 ppm</td>
<td>ppm</td>
<td>1)</td>
<td>No</td>
</tr>
<tr>
<td>PH₃ Phosphine (3 El.)</td>
<td>9602-6102</td>
<td>0 ... 1.00 ppm</td>
<td>ppm</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>PH₃ Phosphine (2 El.)</td>
<td>9602-6100</td>
<td>0 ... 1.00 ppm</td>
<td>ppm</td>
<td>1)</td>
<td>Yes</td>
</tr>
<tr>
<td>SF₆ Sulfur Hexafluoride</td>
<td>9602-9710</td>
<td>0 ... 0.500 % vol</td>
<td>ppm</td>
<td>3)</td>
<td>no data</td>
</tr>
<tr>
<td>SiH₄ Silane</td>
<td>9602-6301</td>
<td>0 ... 50.0 ppm</td>
<td>ppm</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>SO₂ Sulfur Dioxide</td>
<td>9602-5900</td>
<td>0 ... 25.0 ppm</td>
<td>ppm</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>TEOS Tetraethyl Orthosilicate</td>
<td>9602-7500</td>
<td>0 ... 100 ppm</td>
<td>ppm</td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>Substance / Sensor</td>
<td>Part No Sensor</td>
<td>Nominal Range</td>
<td>Unit</td>
<td>Note</td>
<td>Dust Filter allowed</td>
</tr>
<tr>
<td>-------------------</td>
<td>----------------</td>
<td>---------------</td>
<td>------</td>
<td>------</td>
<td>---------------------</td>
</tr>
<tr>
<td>TMB Trimethyl borate</td>
<td>9602-7510</td>
<td>0 ... 500 ppm</td>
<td></td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>TMP Trimethyl phosphite</td>
<td>9602-7800</td>
<td>0 ... 30.0 ppm</td>
<td></td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>

Notes:
1) Special application
2) Special range
3) Pyrolyzer Module required for detection
4) Only for use with Satellite XT C-versions

Further gases and ranges on request

8.2 K-Factors for Satellite XT C-Versions
Catalytic sensors are calibrated for methane. When monitoring for other combustible gases, a correction factor must be entered; consult our local representative.
## 8.3 Spares and Accessories

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>9602.0050.10.03</td>
<td>Mounting Rail Standard</td>
</tr>
<tr>
<td>9602.0050.10.02</td>
<td>Mounting Plate DIN-Rail, Option</td>
</tr>
<tr>
<td>9602.0051.10.02</td>
<td>Mounting Plate L-shaped with DIN-Rail, Option</td>
</tr>
<tr>
<td>9602.0090.00.01</td>
<td>Sensor Extension, 2 meters</td>
</tr>
<tr>
<td>9602.0091.00.01</td>
<td>Sensor Extension, 3 meters</td>
</tr>
<tr>
<td>9602.0092.00.01</td>
<td>Sensor Extension, 1 meter</td>
</tr>
<tr>
<td>9602.0093.00.01</td>
<td>Sensor Extension Combustible Gases, 2 meters</td>
</tr>
<tr>
<td>9602.0094.00.01</td>
<td>Sensor Extension Combustible Gases 3 meters</td>
</tr>
<tr>
<td>9602.0095.40.00</td>
<td>Calibration Cap</td>
</tr>
<tr>
<td>9630-0146</td>
<td>PC Network Adapter PCLTA-21 TP/FT-10</td>
</tr>
<tr>
<td>9650-0540</td>
<td>PC LonTalk Adapter PCC-10 TP/FT 10 for notebook use</td>
</tr>
<tr>
<td>9630-0423</td>
<td>Junction Box for max. 2 nodes</td>
</tr>
<tr>
<td>9630-0424</td>
<td>Junction Box for max. 6 nodes</td>
</tr>
<tr>
<td>9630-0505</td>
<td>Junction Box 1 node /R-Version</td>
</tr>
<tr>
<td>9630-0431</td>
<td>4-wire shielded cable, 2x2x1.0 mm², 100 m coil</td>
</tr>
<tr>
<td>9630-0441</td>
<td>Network Terminator for FTT-10</td>
</tr>
<tr>
<td>9630-0443</td>
<td>Network Terminator for FTT-10 Bus Topology</td>
</tr>
<tr>
<td>9660-0110</td>
<td>Relay Output Module for DIN-Rail Mounting</td>
</tr>
<tr>
<td>9660-0120</td>
<td>Supervisor Module for DIN-Rail Mounting</td>
</tr>
<tr>
<td>9660-0220</td>
<td>Digital Input Module for DIN-Rail Mounting</td>
</tr>
<tr>
<td>9660-0330</td>
<td>Analog Input Module for DIN-Rail Mounting</td>
</tr>
<tr>
<td>9660-0440</td>
<td>Programmable Logic Module</td>
</tr>
<tr>
<td>9675-0440</td>
<td>Router FTT-10 FTT-10, 24 VDC for DIN-Rail Mounting</td>
</tr>
<tr>
<td>9902-4000</td>
<td>Duct Mounting Saddle Assy, 4 inches</td>
</tr>
<tr>
<td>9902-4010</td>
<td>Duct Mounting Saddle Assy, 6 inches</td>
</tr>
<tr>
<td>9902-4020</td>
<td>Duct Mounting Saddle Assy, 8 inches</td>
</tr>
<tr>
<td>9902-4030</td>
<td>Duct Mounting Saddle Assy, 10 inches</td>
</tr>
<tr>
<td>9902-4040</td>
<td>Duct Mounting Saddle Assy, 12 inches</td>
</tr>
<tr>
<td>9902-4100</td>
<td>Duct Mounting Saddle Assy, 1.5 inches</td>
</tr>
<tr>
<td>9902-4110</td>
<td>Duct Mounting Saddle Assy, 2 inches</td>
</tr>
<tr>
<td>9902-4120</td>
<td>Duct Mounting Saddle Assy, 2.5 inches</td>
</tr>
<tr>
<td>9902-4130</td>
<td>Duct Mounting Saddle Assy, 3 inches</td>
</tr>
<tr>
<td>9902-4200</td>
<td>Duct Mounting Saddle (Assy), flat</td>
</tr>
</tbody>
</table>
8.4 Network Terminators

Network Terminators are designed to provide electrical termination for twisted pair channels. They are passive devices and do not require electrical power.

In a free topology FTT-10 segment, one Network Terminator type 9630-0441 is required and may be located anywhere on the segment.

In a bus topology FTT-10 channel, two Network Terminators type 9630-0443 are required, one located at each end of the bus.

Technical Specifications

<table>
<thead>
<tr>
<th>Network</th>
<th>Standardized LonTalk™ protocol</th>
</tr>
</thead>
<tbody>
<tr>
<td>wiring topologies</td>
<td>free, e.g. Bus, Star, Loop, or mixed</td>
</tr>
<tr>
<td>Physical Dimensions</td>
<td></td>
</tr>
<tr>
<td>size</td>
<td>18 x 58 x 60 mm (W x H x D)</td>
</tr>
<tr>
<td></td>
<td>0.7” x 2.3” x 2.4” (W x H x D)</td>
</tr>
<tr>
<td>weight</td>
<td>40 g</td>
</tr>
<tr>
<td></td>
<td>1.4 oz</td>
</tr>
<tr>
<td>Mounting</td>
<td>DIN rail</td>
</tr>
<tr>
<td>Housing Protection Class</td>
<td>IP 20</td>
</tr>
<tr>
<td>Operating Conditions</td>
<td></td>
</tr>
<tr>
<td>temperature</td>
<td>-20 °C ... +50 °C</td>
</tr>
<tr>
<td></td>
<td>-4°F ... +122 °F</td>
</tr>
<tr>
<td>humidity</td>
<td>0 ... 95 % r.h.</td>
</tr>
<tr>
<td>Part Number</td>
<td></td>
</tr>
<tr>
<td>FTT-10</td>
<td>9630-0441</td>
</tr>
<tr>
<td>FTT-10 Bus Topology</td>
<td>9630-0443</td>
</tr>
</tbody>
</table>
8.5 Relay Output Module

The Relay Output Module is a generic unit interfacing with LONWORKS™ systems, that use a free topology wiring scheme supporting star, loop, and/or bus wiring.

The Relay Output Module contains four relays with SPDT contacts and one dedicated power loss relay with SPST contact for activation of external alarm devices.

The relays can be operated in either energized or deenergized condition. All relay states are indicated by LEDs.

Network configuration data is customer specific and is programmed into nonvolatile memory.

Technical Specifications

**Power Requirements**
- voltage: 12 ... 24 VDC
- consumption: max. 1.9 W

**Network**
- Standardized LonTalk™ protocol
- data transmission: 78 kBit per second
- wiring topologies: free, e.g. Bus, Star, Loop, or mixed

**Wiring**
- 4-way shielded cable 2x2x1.0 mm2 / 17 AWG

**Relay Outputs**
- contacts: 4 x SPDT (single-pole-double-throw)
- max. ratings: 250 VAC / 30 VDC, 8 A

**Status Indication**
- 4 red relay state LEDs
- 1 green status LED
- 1 yellow service LED

**Physical Dimensions**
- size: 45 x 80 x 105 mm (W x H x D) 1.8” x 3.1” x 4.1” (W x H x D)
- weight: 220 g 7.8 oz

**Mounting**
- DIN rail

**Housing Protection Class**
- IP 20

**RFI / EMC**
- EN 55022
- EN 61000-6-2

**Operating Conditions**
- temperature: 0 °C ... +40 °C +32 °F ... +104 °F
- humidity: 20 ... 90 % r.h.

**Part Number**
- 9660-0110

![Diagram of Relay Output Module](image)
8.6 Supervisor Module

The Supervisor Module is designed to identify a fault condition within a subnet (max. 127 nodes) of a twisted pair LONWORKS™ network. Meaning one or more nodes on the subnet lose the ability to communicate, due to a bad node hardware or a broken wire. In the latter case, the Supervisor Module automatically restores communication by closing the relay bus switch and thus reconnecting the both sides of the open circuit. Either fault condition is indicated by individual fault relays and reported to an optional monitoring station.

The Supervisor Module contains four relays with SPDT contacts and one dedicated power loss relay with SPST contact for activation of external alarm devices.

The relays can be operated in either energized or deenergized condition. All relay states are indicated by LEDs. Network configuration data is customer specific and is programmed into nonvolatile memory.

Technical Specifications

Power Requirements

- voltage: 12 ... 24 VDC
- consumption: max. 1.9 W

Network

- Standardized LonTalk™ protocol
- data transmission: 78 kBit per second
- wiring topologies: free, e.g. Bus, Star, Loop, or mixed

Wiring

- 4-wire shielded cable 2x2x1.0 mm² / 17 AWG

Relay Outputs

- contacts: 2 x SPDT: Bus Switch
- 1 x SPDT: Node Failure
- 1 x SPDT: Broken Wire
- 1 x SPST: Power Loss
  - (SPDT = single-pole-double-throw)
  - (SPST = single-pole-single-throw)
- max. ratings: 250 VAC / 30 VDC, 8 A

Status Indication

- 4 red relay state LEDs
- 1 green status LED
- 1 yellow service LED

Physical Dimensions

- size: 45 x 80 x 105 mm (W x H x D)
- 1.8” x 3.1” x 4.1” (W x H x D)
- weight: 220 g
- 7.8 oz

Mounting

- DIN rail

Housing Protection Class

- IP 20

RFI / EMC

- EN 55022
- EN 61000-6-2

Operating Conditions

- temperature: 0 °C ... +40 °C
- +32 °F ... +104 °F
- humidity: 20 ... 90 % r.h.

Part Number

- 9660-0120

Reference Information - Section 8
8.7 Digital Input Module

The Digital Input Module is a generic unit interfacing with LONWORKS™ systems, that use a free topology wiring scheme supporting star, loop, and/or bus wiring.

The Digital Input Module contains two groups of four optocoupler isolated digital inputs, each group with separate common signal ground. It is used for processing binary and digital values, e.g. switch signals.

All input states are indicated by LEDs. The module provides one dedicated power loss relay with SPST contact for activation of external alarm devices.

Network configuration data is customer specific and is programmed into nonvolatile memory.

Technical Specifications

**Power Requirements**
- voltage: 12 ... 24 VDC
- consumption: max. 0.8 W

**Network**
- Standardized LonTalk™ protocol
- data transmission: 78 kBit per second
- wiring topologies: free, e.g. Bus, Star, Loop, or mixed

**Wiring**
- 4-wire shielded cable 2x2x1.0 mm² / 17 AWG

**Digital Inputs**
- channels: 8 (2 groups of 4) optocoupler isolated
- input voltage:
  - High Level: 12 ... 24 VDC
  - Low Level: 0 ... 2 VDC

**Status Indication**
- 8 red input state LEDs
- 1 green status LED
- 1 yellow service LED

**Relay Output**
- contact: 1 x SPST (single-pole-single-throw)
- max. ratings: 250 VAC / 30 VDC, 8 A

**Physical Dimensions**
- size: 45 x 80 x 105 mm (W x H x D)
- 1.8” x 3.1” x 4.1” (W x H x D)
- weight: 190 g
- 6.7 oz

**Mounting**
- DIN rail

**Housing Protection Class**
- IP 20

**RFI / EMC**
- EN 55022
- EN 61000-6-2

**Operating Conditions**
- temperature: 0 °C ... +40 °C
- +32 °F ... +104 °F
- humidity: 20 ... 90 % r.h.

**Part Number**
- 9660-0220
8.8 Analog Input Module

The Analog Input Module is a generic unit interfacing with LONWORKS™ systems, that use a free topology wiring scheme supporting star, loop, and/or bus wiring.

The Analog Input Module contains two isolated groups of each two analog input channels, for processing ± 0-10 VDC or ± 0-25 mA current signals. The analog inputs can be logically connected via a network to different input/output modules and data visualization software. For each channel the module offers two user-settable alarm levels and input scaling.

All states are indicated by LEDs. The module provides one dedicated power loss relay with SPST contact for activation of external alarm devices.

Network configuration data is customer specific and is programmed into nonvolatile memory.

Technical Specifications

Power Requirements
- voltage: 12 ... 24 VDC
- consumption: typically 2 W

Network
- Standardized LonTalk™ protocol
- data transmission: 78 kBit per second
- wiring topologies: free, e.g. Bus, Star, Loop, or mixed

Wiring
- 4-wire shielded cable 2x2x1.0 mm² / 17 AWG

Analog Inputs
- channels: 2 isolated groups of each 2 inputs
- signal range: ± 0 - 10 VDC or ± 0 - 25 mA
- resolution: 14-bit, 10 samples per second

Status Indication
- 8 red input state LEDs
- 1 green status LED
- 1 yellow service LED

Relay Output
- contact: 1 x SPST (single-pole-single-throw)
- max. ratings: 250 VAC / 30 VDC, 8 A

Physical Dimensions
- size: 45 x 80 x 105 mm (W x H x D)
- 1.8" x 3.1" x 4.1"
- weight: 200 g
- 7 oz

Mounting
- DIN rail

Housing Protection Class
- EN 55022
- EN 61000-6-2

Operating Conditions
- temperature: 0 °C ... +40 °C
- +32 °F ... +104 °F
- humidity: 20 ... 90 % r.h.

Part Number
- 9660-0330

<table>
<thead>
<tr>
<th>Channel</th>
<th>U+</th>
<th>Com-</th>
<th>I+</th>
<th>C</th>
<th>P+</th>
<th>P-</th>
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<tr>
<td>Ch 1</td>
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<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Ch 2</td>
<td>7</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Ch 3</td>
<td>13</td>
<td>14</td>
<td>15</td>
<td>16</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>Ch 4</td>
<td>19</td>
<td>20</td>
<td>21</td>
<td>21</td>
<td>21</td>
<td>21</td>
</tr>
</tbody>
</table>

Power Requirements: 12 ... 24 VDC, typ. 2 W
Input Voltage Range: ± 0 ... 10 VDC
Input Current Range: ± 0 ... 25 mA
Relay Ratings: 250 VAC / 30 VDC, 8 A
8.9 Router Modules

Router Modules connect two communication channels and route LonTalk™ messages between them. These modules interface two different twisted-pair channels, e.g. high speed backbone and a free topology channel. Additionally the routers are used to manage network traffic, increase the total number of nodes, or extend the maximum channel length.

All states are indicated by LEDs. The module provides one dedicated power loss relay with SPST contact for activation of external alarm devices.

Network configuration data is customer specific and is programmed into nonvolatile memory.

Technical Specifications

**Power Requirements**
- voltage: 12 ... 24 VDC
- consumption: max. 1.2 W

**Network**
- Standardized LonTalk™ protocol

**Wiring**
- shielded 4-wire cable 2x2x1.0 mm² /17 AWG

**Transceiver Types**
- FTT-10A (78 kBit per second)
- TP/XF-1250 (1.25 MBit per second)

**Status Indication**
- 1 red network traffic LED
- 1 green status LED
- 2 yellow service LEDs

**Relay Output**
- contact: 1 x SPST (single-pole-single-throw)
- max. ratings: 250 VAC / 30 VDC, 8 A

**Physical Dimensions**
- size: 45 x 80 x 105 mm (W x H x D)
- weight: 220 g

**Mounting**
- DIN rail

**Housing Protection Class**
- IP 20

**RFI / EMC**
- EN 55022
- EN 61000-6-2

**Operating Conditions**
- temperature: 0 °C ... +40 °C
- humidity: 20 ... 90 % r.h.

**Part Number**
- FTT-10 FTT-10 9675-0440
9.1 Principle of Operation

The Extractive Module XT is an add-on module for use in combination with the Satellite XT. It enables for keeping hazardous, difficult to reach, or otherwise inaccessible areas under continuous surveillance. It is capable of sampling areas up to 50 m away. Power is supplied via the Satellite XT. Status information is provided by the Satellite XT that provides the digital interface as well.

The module contains a diagnosis for electronics and pump. The correct gas flow is factory set and saved in the instrument. If there is a problem with the Extractive Module XT, the display of the Satellite XT shows the fault message FAULT EXTRACTIVE. For information on fault messages and instructions on how to correct a fault condition, please refer to Section 7, Troubleshooting.

9.2 General Instructions

Listed hereafter several aspects that should be reflected when locating monitoring point and instrument. When placing the sampling point, the property (lighter or heavier than air) of the target gas must be considered. The instrument should be mounted as close to the monitoring location as possible to minimize sample transport time. The area immediately surrounding the sample inlet at the monitoring point must be free from objects that might hinder free flow of air. The instrument should be installed away from any possible liquid sources, extreme dust and dirt sources and should be protected against rain and sunlight.

The sample line should be run as direct as possible to improve transport time. Avoid running the sample line through areas of great temperature extremes. The sample outlet must be connected to an exhaust line and must be properly vented. Both, sample and exhaust tubing must not be crimped or placed in an area where weight could collapse the tubing.

Dust may be a result of construction as well as manufacturing activities. If unusual quantities of dust are expected at the monitoring location, an appropriate filter for the sample line must be installed. The use of a dust filter depends on the target gas, refer to the table Sensor Order Information in Section 8, Reference Information, or contact our service department.

As excess amounts of dirt in the filters will reduce the sample flow and will thus affect concentration readings of the instrument, make sure to regularly change sample line filters (every 1 to 6 months, depending on the ambient conditions). For order information refer to Section 8, Reference Information, Spares and Accessories.

Moisture may occur as rain entering a line at an outdoor sampling location or as condensation from outdoor-to-indoor temperature fluctuations. In case of unusual quantities of moisture, appropriate steps must be taken to protect the instrument; consult us for respective assistance.

9.3 Safety Instructions

Never use compressed air to clean the tubing while it is connected to the instrument.

Use isopropanol and a soft cloth to clean the housing. Do not use any aggressive detergents.

! Note:
To extend an existing Satellite XT to an extractive system, please contact our service department. This modification makes it necessary to open the housing of the Satellite XT, which is only allowed for authorized persons.
9.4 Instrument Design

Front View showing Extractive Module XT connected to Satellite XT.
**Side View (left)**
A Exhaust Line - Outlet  
B Sensor Holder  
C Sample Line - Gas Inlet  

**Side View (right)**
B Sensor Holder  
D Sensor Connection to Satellite XT  
E Connection Extractive Module XT and Satellite XT  

**Top View (only Extractive Module XT)**
A Exhaust Line - Outlet  
B Sensor Holder  
C Sample Line - Gas Inlet  
D Sensor Connection to Satellite XT
9.5 Mounting

The Extractive Module XT is prepared for DIN-rail mounting. An appropriate mounting rail is delivered with the instrument, which allows mounting the Extractive Module XT and the Satellite XT side by side.

Mount this rail to a wall with the appropriate fasteners and slide both modules onto it. Plug in male and female connector of Satellite XT and Extractive Module XT.

9.6 Tubing Connections

Tubing material is PTFE or PFA with an outer diameter of 1/4” and an inner diameter of 3/16”. Length and inner diameter of the sample line will affect the response time. Length of the sample lines should be kept as short as possible. With a sample line ID of 3/16” (4.7 mm) and a length of 10 m, the delay in response does not exceed 30 seconds.

**Sample Line Inlet**
The fitting for connecting the sample line inlet is located on top of the housing and marked “Gas Inlet”. Improper installation of the sample inlet tube may result in dilution or even complete loss of the sample.

**Exhaust Line Outlet**
The fitting for connection of the exhaust line outlet is located on top of the instrument and marked “Outlet”. Since hazardous gas concentrations may still be present at the exhaust line outlet, it is recommended to connect the exhaust line to an exhaust duct.

**Note:**
If the pump is operated at the maximum sample line distance of 50 m, the maximum exhaust line length is 25 m to avoid flow failure due to back pressure in the pump.

**Note:**
Do not apply power until the system is ready for start-up.
9.7 Sensor Replacement

This procedure is used to replace a depleted sensor by a fresh sensor. The replacement sensor must have the same part number as the installed sensor. Press the <esc> key on the Satellite XT keypad and enter the password to exit the Monitoring Mode. The green status LED of the Satellite XT is off, the instrument is not monitoring. A maintenance message is transmitted to the communication network.

Go to the Maintenance Menu and press the <set> key to enter. 
Go to the submenu Sensor Service and press the <set> key to enter. 
Follow the dialogue displayed at the bottom line of the screen - Figure 1.

**Figure 1**

<REMOVE SENSOR>
Unscrew the gland nut (F) to remove the sensor holder (B) from the flow adapter of the Extractive Module XT - Figure 2. Remove the installed sensor (G) - Figure 3. 
Press the <set> key to continue. Unpack the replacement sensor and remove shorting device from the sensor plug, where necessary.

<REPLACEMENT>
Insert the new sensor (G) into the socket inside the sensor holder, aligning nose of the socket, groove of the sensor, and the arrow printed on the sensor label - Figure 4. Insert the sensor holder (B) with the replacement sensor installed into the flow adapter of the instrument and fasten the gland nut (F) - Figure 5. Press the <set> key to continue.

<LOAD NEW DATA ?>
If you want the data of the new sensor to be loaded, confirm this message by pressing the <set> key.

<LOADING DATA !>
The instrument is now loading the new data from the sensor into the unit's internal memory.

SENSOR WARM-UP
A sensor warm-up is performed and the display of the Satellite XT shows the according message, until the displayed value is zero. The warm-up time required depends on the type of sensor.

After the sensor warm-up, the instrument will automatically switch to the Monitoring Mode.

The Sensor Service procedure is also described in Section 4, Maintenance.
9.8 Technical Specifications

Power Requirements
Voltage power is provided by the Satellite XT, power supply range 18 - 24 VDC

Consumption max. 2.4 W

Physical Dimensions
Size 78 x 95,5 x 50 mm (W x H x D)
3,1" x 3,8" x 2,0" (W x H x D)
Weight 500 g
17.6 oz

Housing Protection Class IP 30

RFI / EMC EN 50270

Operating Conditions
Sample tubing OD 1/4" ID 3/16" PTFE or PFA
Response time < 30 sec. with a tubing length of 10m
Temperature 0 °C ... +40 °C
+32 °F ... +104 °F
Pressure 700 ... 1300 hPa
Humidity 20 ... 90 % r.h.

Maximum negative pressure (at pump) -150mbar

Maximum sample line length 50 m (see note in section 9.6)
Recommended sample line length 10 m

Part Number
version for toxic/corrosive gases (except C$_5$F$_8$ and SF$_6$) 20404-0200
version for combustible gases 20404-0250
version for C$_5$F$_8$ and SF$_6$ 20404-0300

Warning:
Extractive Module 20404-0200 must only be used with Pyrolyzer Modules 20408-0110, 20408-0112, 20408-0116 and 20408-0122.
Extractive Module 20404-0300 must only be used with Pyrolyzer Modules 20408-0114 and 20408-0120.
10.1 Principle of Operation

The Pyrolyzer Module XT is an add-on module for monitoring gases requiring pyrolytic sample preparation for detectability. It requires both, a Satellite XT and an Extractive Module XT. The connected Satellite XT displays the module’s status of operation and provides the digital interface.

Each instrument is only configured for monitoring the substance specified on the identification label. The instrument is delivered with a certain sensor installed. Reference for assignment of instrument and sensor is the serial number. These data are also documented in the Certificate of Quality Control provided with the shipment. Instrument and sensor have been gas calibrated and these specific calibration parameters are stored in the integrated data memory of sensor and instrument.

Make sure to use only sensors for the substance specified on the module’s identification label. Use only sensors designed for use with the Pyrolyzer Module XT.

The Pyrolyzer Module XT is powered by a wide range power supply. The module contains a diagnosis for electronics and filament. The filament voltage is factory set and saved in the instrument. If there is a problem with the Pyrolyzer Module XT, the display of the Satellite XT reads FAULT PYROLYZER. Information on fault messages and instructions on how to correct a fault condition, are provided in Section 7, Troubleshooting.

10.2 General Instructions

Listed hereafter are several aspects that should be reflected when locating monitoring point and instrument. When placing the sampling point, the property (lighter or heavier than air) of the target gas must be considered. The instrument should be mounted as close to the monitoring location as possible to minimize sample transport time. The area immediately surrounding the sample inlet at the monitoring point must be free from objects that might hinder free flow of air. The instrument should be installed away from any possible liquid sources, extreme dust and dirt sources and should be protected against rain and sunlight.

The instrument must be mounted in an upright position. The ventilation apertures on top and rear of the instrument must not be covered. The instrument must be easily accessible for operation and there must be sufficient space above the instrument to allow sensor replacement or to open the housing for maintenance purposes.

The sample line should be run as direct as possible to improve transport time. Avoid running the sample line through areas of great temperature extremes. The sample outlet must be connected to an exhaust line and must be properly vented. Both, sample and exhaust tubing must not be crimped or placed in an area where weight could collapse the tubing.

10.3 Safety Instructions

Always disconnect the Pyrolyzer Module XT from mains power before you open the housing. The vents on top and rear of the instrument must not be covered. Do not enter any tapered or sharp items into the vents.

Use isopropanol and a soft cloth to clean the housing. Do not use any aggressive detergents. Never use compressed air to clean the tubing when connected to the instrument. This will destroy the internal pressure switch.

WARNING: The Pyrolyzer Module XT will not respond to the target gas in conditions of less than 20 % r.h. Observe the specified operating conditions for humidity.
10.4 Instrument Design

The Pyrolyzer Module XT can only be operated in combination with the Satellite XT and the Extractive Module XT. All three modules are prepared for DIN-rail assembly.

Figure 1: Side view of the Pyrolyzer Module only.

Figure 2: Front view of the complete assembly Pyrolyzer Module, Extractive Module, and Satellite XT.

Figure 3: Top View of the complete assembly

B Sensor Holder
F Sample Line - Inlet
G Vent
H Sample Line - connection to Extractive Module XT
J DIN-rail
K Data Link - Pyrolyzer Module XT to Extractive Module XT
L Power Fitting
M Adapter for DIN-rail
10.5 Mounting

The Pyrolyzer Module XT is prepared for DIN-rail assembly. An appropriate mounting rail is delivered with the instrument. Mount this rail to a flat surface with the appropriate fasteners.

When the rail is mounted, follow the steps below:

1. Slide the Pyrolyzer Module XT onto the rail mounted to the wall, see Figure 4.

2. Slide the Extractive Module XT onto the rail at the front of the Pyrolyzer Module XT, see Figure 5.

3. Slide the Satellite XT onto the rail at the front of the Pyrolyzer Module XT, as illustrated in Figure 5.

4. Plug in male and female connector of Satellite XT and Extractive Module XT.

See also Section 9, Extractive Module XT Installation.
10.6 Tubing Connections

Tubing material is PTFE or PFA with an outer diameter of 1/4” and an inner diameter of 3/16”. Length and inner diameter of the sample line will affect the response time. Length of the sample lines should be kept as short as possible. With a sample line ID of 3/16” (4.7 mm) and a length of 10 m, the delay in response does not exceed 30 seconds. Moisture may occur either as rain entering a line at an outdoor sampling location or as condensation from outdoor-to-indoor temperature fluctuations. In case of unusual quantities of moisture, appropriate steps must be taken to protect the instrument; consult us for respective assistance.

Sample Line Inlet

The fitting for connecting the sample line inlet is located on top of the housing and marked “Inlet”. Improper installation of the sample inlet tube may result in dilution or even complete loss of sample.

Sample Line Filter

Dust may be a result of construction as well as manufacturing activities. If unusual quantities of dust are expected at the monitoring location, an appropriate filter for the sample line must be installed. The use of a dust filter depends on the target gas, refer to the table Sensor Order Information in Section 8, Reference Information, or contact our service department. As excess amounts of dirt in the filters will reduce the sample flow and will thus affect concentration readings of the instrument, make sure to regularly change sample line filters (every 1 to 6 months, depending on the ambient conditions). For order information refer to Section 8, Reference Information, Spares and Accessories.

Module Connections

- Sample tubing.
- Sensor connection between Extractive Module XT and Satellite XT.
- Data link connecting Pyrolyzer Module XT and Extractive Module XT / Satellite XT.

10.7 Data Link

Plug the cable (pictured green) from the bottom plate of the Pyrolyzer Module into the connector in the bottom of the Extractive Module XT.

10.8 Power Connection

Use a standard power cable (obey any local regulations) and bring it through the power cable fitting into the module. Open the module from the top and connect 240 VAC...
**Pyrolyzer XT with bypass for C5F8**

When the Pyrolyzer is used with C5F8, the flow needs to be adjusted at the outlet of the Extractive Module XT to 0.5 l/min or 30 l/h.

On the underside of the Extractive Module XT is the interconnection to the Pyrolyzer Module XT, and next to it, two small holes which gives access to two pushbuttons. The left hand button will increase the flow, and the right hand button will decrease it.

The adjustment is required as the internal flow resistance is different to the other types of the Pyrolyzer Module XT and this resistance would damage the Extractive Module XT.
10.9 Technical Specifications

Power requirements
Voltage 90 ... 240 VAC
Consumption approx. 22 W / 2.13 A

Physical dimensions
Size: 223 x 97 x 100 mm (W x H x D)
8,8" x 3,8" x 3,9" (W x H x D)
Weight: 1800 g
4 lbs

Housing Protection Class
IP 30

RFI / EMC
EN 61010-1
EN 50270

Operating Conditions
Sample tubing OD 1/4" ID 3/16"
Response time < 30 sec. with a tubing length of 10m
Temperature 0 °C ... +40 °C
+32 °F ... +104 °F
Pressure 700 ... 1300 hPa
Humidity 20 ... 90 % r.h.

Note: For applications where the humidity is less than 20 % r.h., consider using the MST Sample Conditioning System - Humidifier, part number 20408-4010.

Minimum Oxygen content of sample 3 %v/v

Part Numbers
Pyrolyzer Module XT NF3 20408-0110
Pyrolyzer Module XT 1,2-DCE 20408-0112
Pyrolyzer Module XT SF6 20408-0114
Pyrolyzer Module XT CH3F 20408-0116
Pyrolyzer Module XT C5F8 20408-0120
Pyrolyzer Module XT C4F6 20408-0122

Warning:
Pyrolyzer Modules 20408-0110, 20408-0112, 20408-0116 and 20408-0122 must only be used with Extractive Module 20404-0200.
Pyrolyzer Modules 20408-0114 and 20408-0120 must only be used with Extractive Module 20404-0300.