YELLOW FINCH

SOFTWARE INTERFACE



Technical Manual

PHOENIXZ

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1. Introduction

The Yellow Finch Software Interface provides a real-time monitoring and control platform for the Gas Monitoring Station (GMS) network and Remote Terminal Unit (RTU).

This interface is intended for operators and technicians to:

- Monitor gas concentrations in real time
- Observe alarm conditions
- Analyse historical data
- Adjust system parameters
- Export recorded data

2. System Overview

The interface operates as part of the Yellow Finch Gas Monitoring Network:

- RTU (surface unit)
- Multiple GMS units (underground)
- Optical fibre communication

All sensor data is transmitted optically to the RTU and presented through a web-based interface.

3. Accessing the Interface

To access the system:

1. Connect your device to the RTU network (Ethernet or Wi-Fi)
2. Open a web browser
3. Enter the RTU IP address
4. The **DASHBOARD (Network Overview Page)** will open

4. DASHBOARD (Network Overview Page)



The Dashboard is the **main control and monitoring screen**. It displays **all GMS units in the network simultaneously**.

4.1 GMS Summary Panels

Each GMS is represented by a **summary panel**.

Each panel displays:

- Gas concentrations:
  - CH_4
  - CO
  - CO_2
  - O_2
- Temperature
- Air pressure
- Voltage at optical power converter
- Battery voltage



4.2 GMS Identification

Each GMS panel includes:

- **Top-left:** Serial number (unique GMS ID)
- **Top-right:** Status indicator
  - Green → Online
  - Red → Offline
- **Bottom-right:** Timestamp (last update time)

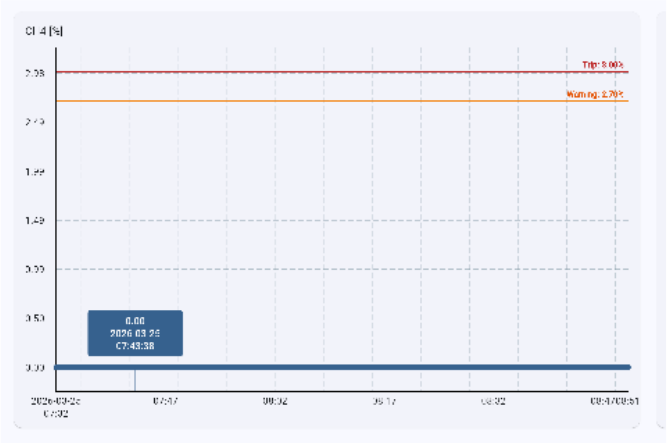
4.3 Alarm Behaviour on Dashboard

Each sensor has predefined:

- Warning limits
- Trip limits

Behaviour:

- If **Warning level is exceeded**:
  Sensor value turns **red**
- If **Trip level is exceeded**:
  Entire GMS panel frame turns **red**



4.4 Automatic Detection of GMS

- When a new GMS is connected to the network:
  A new panel automatically appears on Dashboard

- Number of panels equals to number of active GMS units in the network

4.5 Dashboard Control Menu (Top Right)



The Dashboard includes three main control menus:

1. Sensors
Used to control **photodetector gain in PDU**

Purpose:
Adjust signal amplification depending on fibre quality connecting RTU to particular GMS

Modes:

- **Automatic Gain Control (recommended)**
  - Gain adjusts automatically
  - Prevents saturation
  - Compensates for signal loss
- **Manual Mode**
  - User adjusts gain via slider
  -
  - Used for diagnostics or tuning

2. Export

Used to download recorded data.

Steps:

1. Select GMS
2. Select sensor(s)
3. Select time range
4. Download data

Output:

- CSV format (Excel compatible)

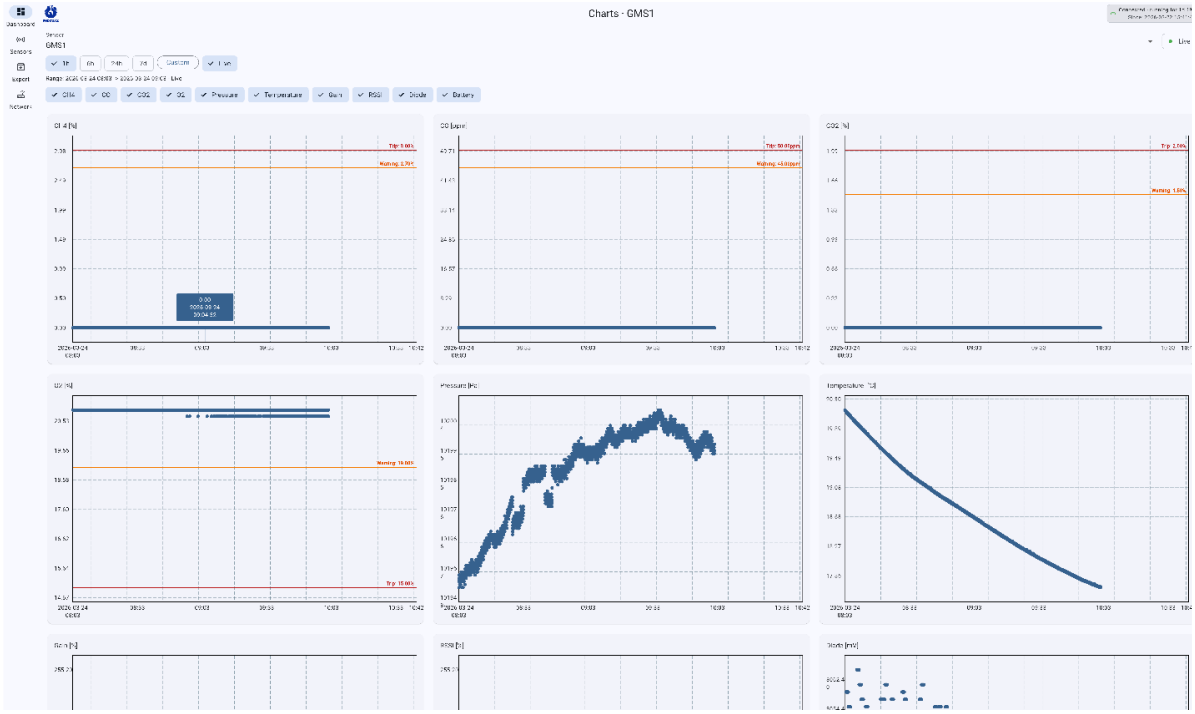
3. Network:

Displays system connection details:

- RTU IP address
- Network configuration
- Access credentials

5. Station Data View (SENSOR PAGE)

To open: Click on any GMS panel on Dashboard



5.1 Displayed Data

The Station View shows:

- Real-time gas readings
- Temperature and pressure
- Battery voltage
- Optical converter voltage
- Photodetector gain

5.2 Graph Display

Each sensor is displayed as a **time-based graph**

Graph includes:

- Sensor output vs time
- Time stamps
- Warning limits
- Trip limits

5.3 Alarm Behaviour in Graphs

- When **Warning exceeded**:
  Sensor value highlighted
- When **Trip exceeded**:
  Alarm condition clearly visible on graph

5.4 Time Range Selection

User can select:

- 1 hour
- 6 hours
- 24 hours
- 7 days
- Custom range



5.5 Live Mode

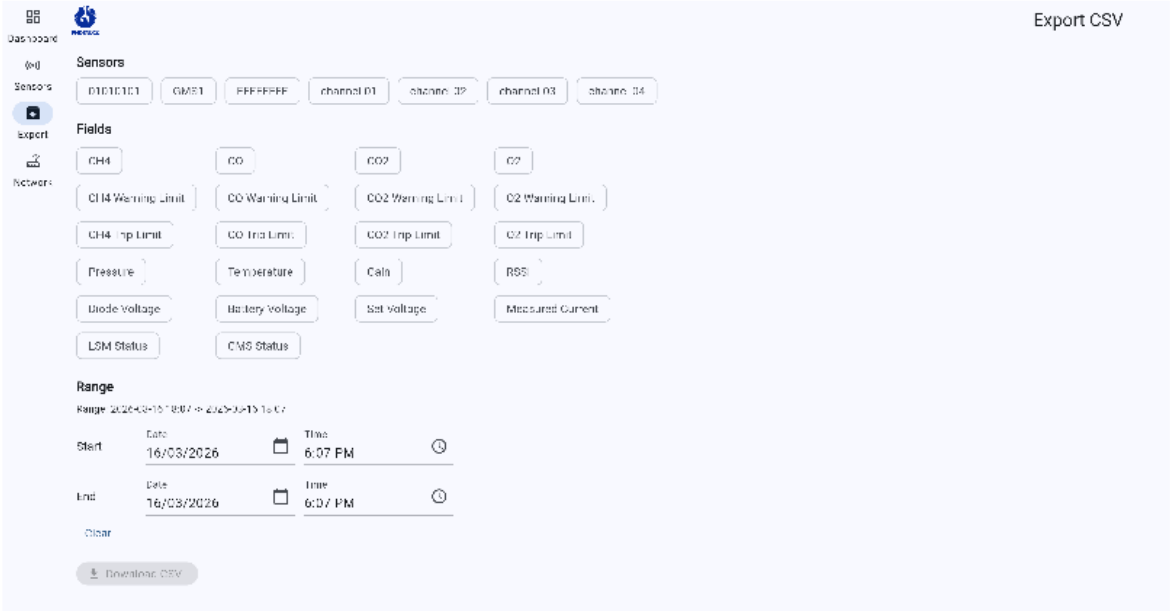
Click **“Live”**: Graph updates in real time

5.6 Sensor Selection

User can choose which sensor to display:

- Individual gas
- Environmental data

6. Data Export (Detailed Procedure)

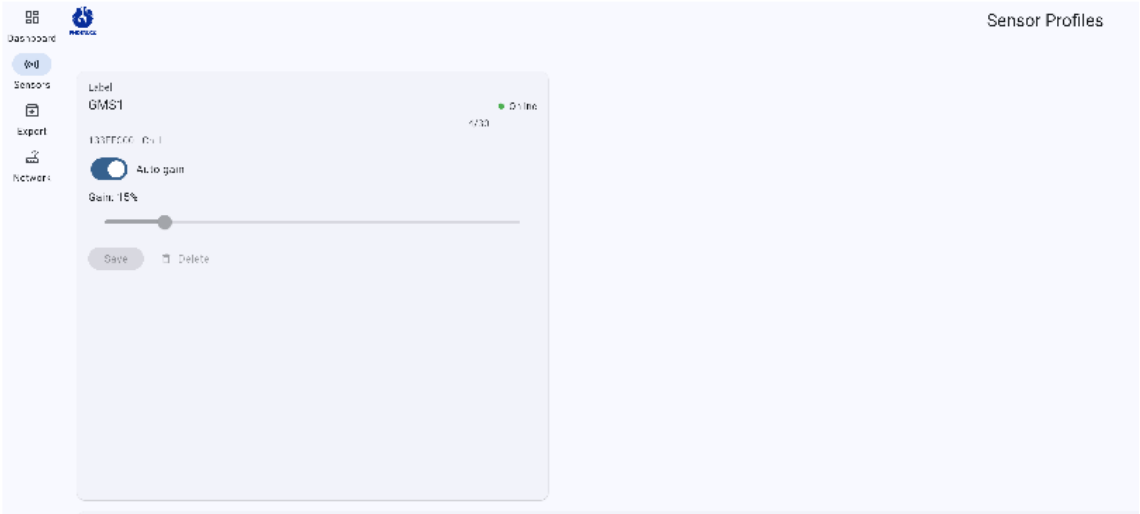


To export data:

1. Open **Export menu**
2. Select GMS
3. Select sensor(s)
4. Select:
    - Data values
    - Warning limits
    - Trip limits
5. Select time range
6. Download file

Output format: CSV (Excel compatible)

7. Photodetector Gain Adjustment (Important)



Gain must be adjusted depending on fibre conditions.

When to adjust:

- Weak signal (long fibre / losses)
- Strong signal (risk of saturation)

Recommended operation:

- Use **Automatic mode** during normal operation
- Use **Manual mode** only for diagnostics

8. Alarm System

The interface supports three states:

- Normal
- Warning
- Trip

Visual behaviour:

Condition	Dashboard	Sensor Page
Normal	Green	Normal
Warning	Value turns red	Highlighted
Trip	Frame turns red	Critical

9. Data Logging

All data is continuously recorded.

Storage:

- Micro-SD card in RTU

Logged data:

- Sensor readings
- Alarm events
- Calibration events
- System status

10. Calibration (via mobile APP in mobile device)

Calibration can be monitored and partially controlled via APP only.

Includes:

- Zero calibration
- Span calibration
- Response time calibration
- Threshold adjustment
- Sampling rate configuration
- Setting Worning and Tripping limits

All actions are:

Time-stamped
Logged

11. SCADA Integration

The RTU outputs data via Ethernet.

Supports:

- SCADA systems
- Industrial control systems

12. Troubleshooting

Problem	Cause	Solution
No data	No RTU connection	Check network
GMS missing	Offline	Check fibre
Incorrect readings	Calibration drift	Recalibrate
No history	Logging issue	Check SD card