Installation and User manual

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1. Introduction

The Configuration Software SWCX1 provides a PC user interface for X1 series modules that allows the user to:

- Read and Write configuration parameters from and to the unit (via RS485, USB-C or Ethernet port);
- Restore data to and from local hard drive for backup;
- Monitor Input values (via RS485, USB-C or Ethernet port);
- Gateway firmware update via USB-C

1.1 Obtaining the SWCX1

The SWCX1 is absolutely free-of-charge and can be freely downloaded from Software.

1.2 Configurable models

G.M. International models that can be configured via SWCX1 software are:

- Analog input: X1-IS-AI-01-S, X1-IS-AI-02-S, X1-NIS-AI-01-S, X1-NIS-AI-02-S.
- Analog output: X1-IS-AO-01-S, X1-IS-AO-02-S, X1-NIS-AO-01-S, X1-NIS-AO-02-S.
- Universal module: X1-IS-UNI-01-S, X1-NIS-UNI-01-S.
- Digital input: X1-IS-DI-02-S, X1-NIS-DI-02-S.
- Digital output: X1-IS-DO-01-S, X1-NIS-DO-01-S, X1-IS-DO-02-S, X1-NIS-DO-02-S.
- Relay Output: X1-NIS-RLO/SS-04-S, X1-NIS-RLO/SS-05-S, X1-NIS-RLO/EM-04-S, X1-NIS-RLO/EM-05-S.
- Temperature Converter: X1-IS-TMP-01-S, X1-NIS-TMP-01-S.
- Gateway : X1-GW-01.

1.3 Hardware Requirements

The Configuration Software has to be installed on a machine with the following minimum requirements:

- Processor: min. 500MHz;
- Working memory: min. 256 MB;
- Hard disk space: min. 200 MB;
- graphic resolution: 1024 x 768 with 100% screen resizing;
- USB port;
- LAN port

2. SWCX1 Main Window

When launched, the SWCX1 configuration software loads a main window and displays the communication settings window (see Figure 1).

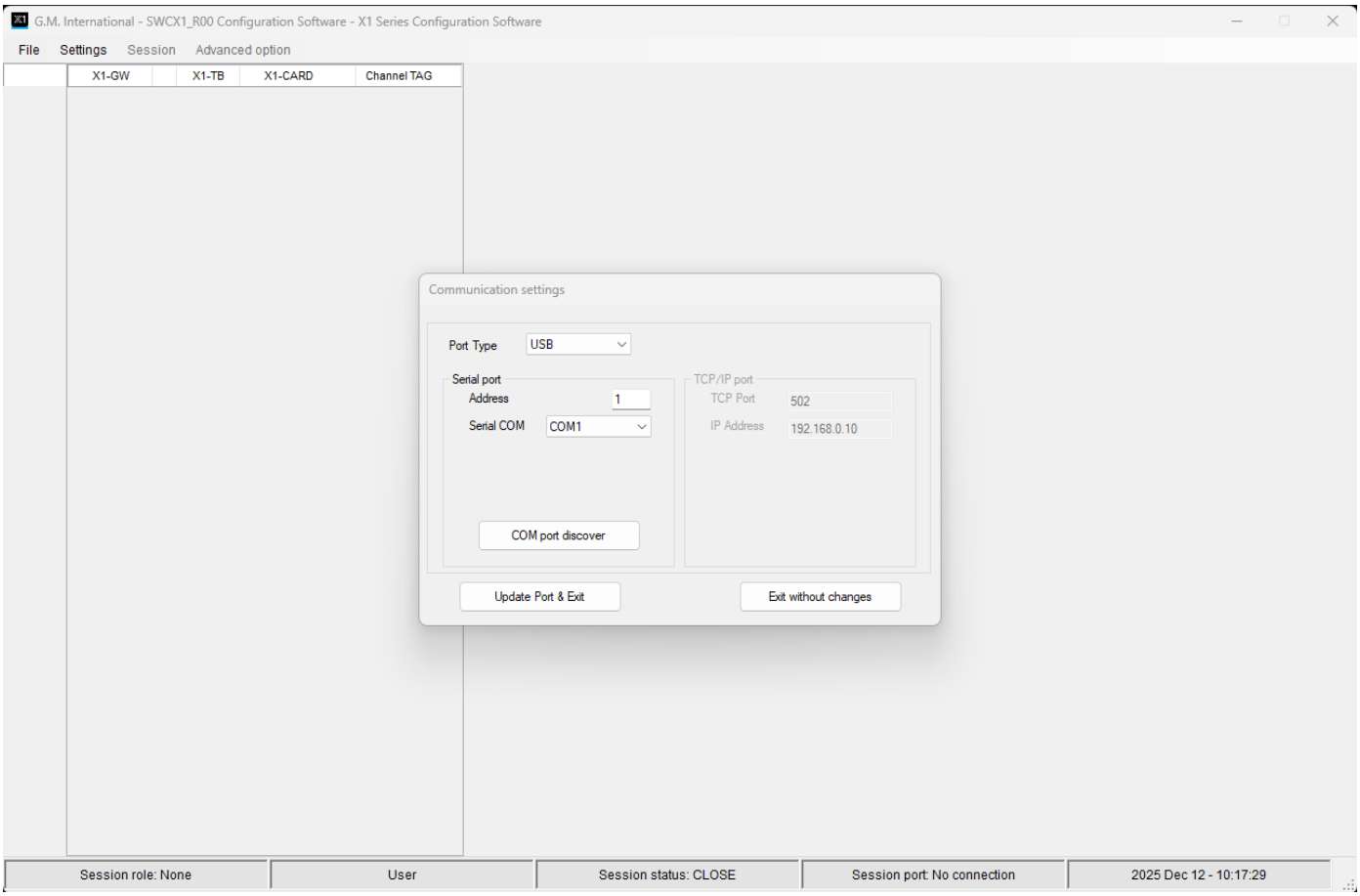

Figure 1: Main Menu

2.1 Communication settings

In the **Communication settings** window (see figure 2) the user can choose the COM Serial Port, RS485 or the TCP-IP Port to communicate with X1-GW-01.

When USB port type is selected a **"COM port discover"** button is available. This option may be initiated at any time by the user in order to search for a valid unit that connects via USB-C port.

Finally, the communication port can be updated by pressing the **"Update Port & Exit"** button or left unchanged by pressing the **"Exit without changes"** button.

If the USB port is connected to the gateway at startup, communication begins automatically without the need for manual selection.

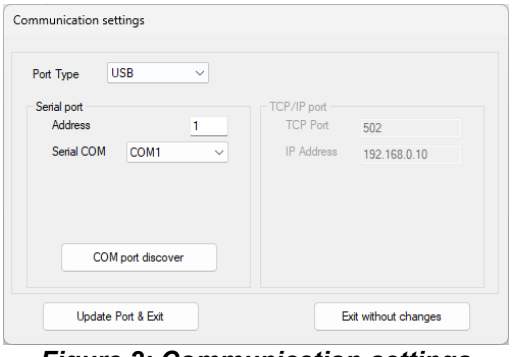

Figure 2: Communication settings

2.2 Menu

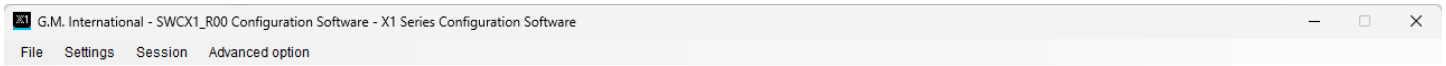

Figure 3: Top Menu.

The menu at the top of the Main Window (see Figure 3) is divided into the following entries:

- **"File"**
  - **Open:** load configuration data from local hard drive backup;
  - **Save:** save configuration data to the present local hard drive backup;
  - **Save as…:** save configuration data to a different local hard drive backup;
  - **Exit:** exit from the configuration software.
- **"Settings"**
  - **Com port :** Configure communication port. *Refer to paragraph 2.1 Communication settings*.
  - **Advanced settings:** Available when the access user role is Administrator.
    - **User administration**: Activate and change Maintenance and Administrator passwords
    - **Timer:** Synchronize the internal real-time clock.
    - **Firmware update:** An external boot loader allows firmware revision upgrade.

    Available when access role is Administrator.
- **"Session"**
  - **Login:** User can login according to three alternative roles:
    - **Observer**: can perform only read operations. No password is required;
    - **Maintenance**: can perform read and application-oriented write operations. Password can be required (by Administrator);
    - **Administrator**: can perform all the read and write operations carried out by Maintenance. Password can be required (by Administrator himself). Additionally, the role can:
      - Activate and change Maintenance and Administrator passwords.
      - Write Communication and Cyber Security related parameters.
      - Synchronize the internal real-time clock (especially for logging purposes).
    - **Factory**: can perform Read and Write MODBUS operations and data access rights are extended compared to Maintenance/Administrator roles. Password is always required after the first login. **This profile is necessary during routine tests and debug performed by GMI personnel.**
  - **Close:** Close the active session and log out the user.
  - **Test connection:** Check the connection to the Gateway.
  - **Scan Enable:** The Gateway scans all the populated channels, in turn, to verify the presence and the status of each module, while copying the main monitor information to a specific memory location. The user can then access this memory section at full speed to gather all meaningful field data at once. *(Available when the access user role is not Observer)*
    - **OFF**
    - **ON**
- **"Advanced Option"**
  - **Diagnostic:** this panel allows user to check and reset the Device malfunction and the configuration change flag.
  - **T-proof:** this panel allows user to perform the t-proof test on the relay output modules. *(Available when the access user role is Administrator)*
  - **Scan panel:** this panel allows user to activate the gateway scan mode and monitor the field data. *(Available when the access user role is not Observer)*
  - **Module identification:** this panel allows user to read the identification parameters (serial number, hardware revision, software revision and product code) of the available X1 modules.

2.3 Bottom Bar

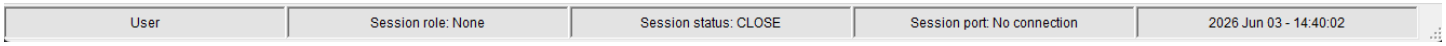

Figure 4: Bottom Bar.

The Bottom Bar (see Figure 4) includes a username, session role, session status, session port and the current date & time.

3. Application Windows

The center of the SWCX1 Configuration Software window is filled with the Application Window, which is different for each module. In the Application Window the user can read the field data, configure the data ranges and so on.

3.1 X1-IS-AI-01-S, X1-IS-AI-02-S, X1-NIS-AI-01-S, X1-NIS-AI-02-S

The current repeater power supply module is a high integrity analog input interface suitable for applications requiring SIL 3 level in safety related systems for high-risk industries.

- **Configuration**
- **Monitor**

3.1.1 Configuration

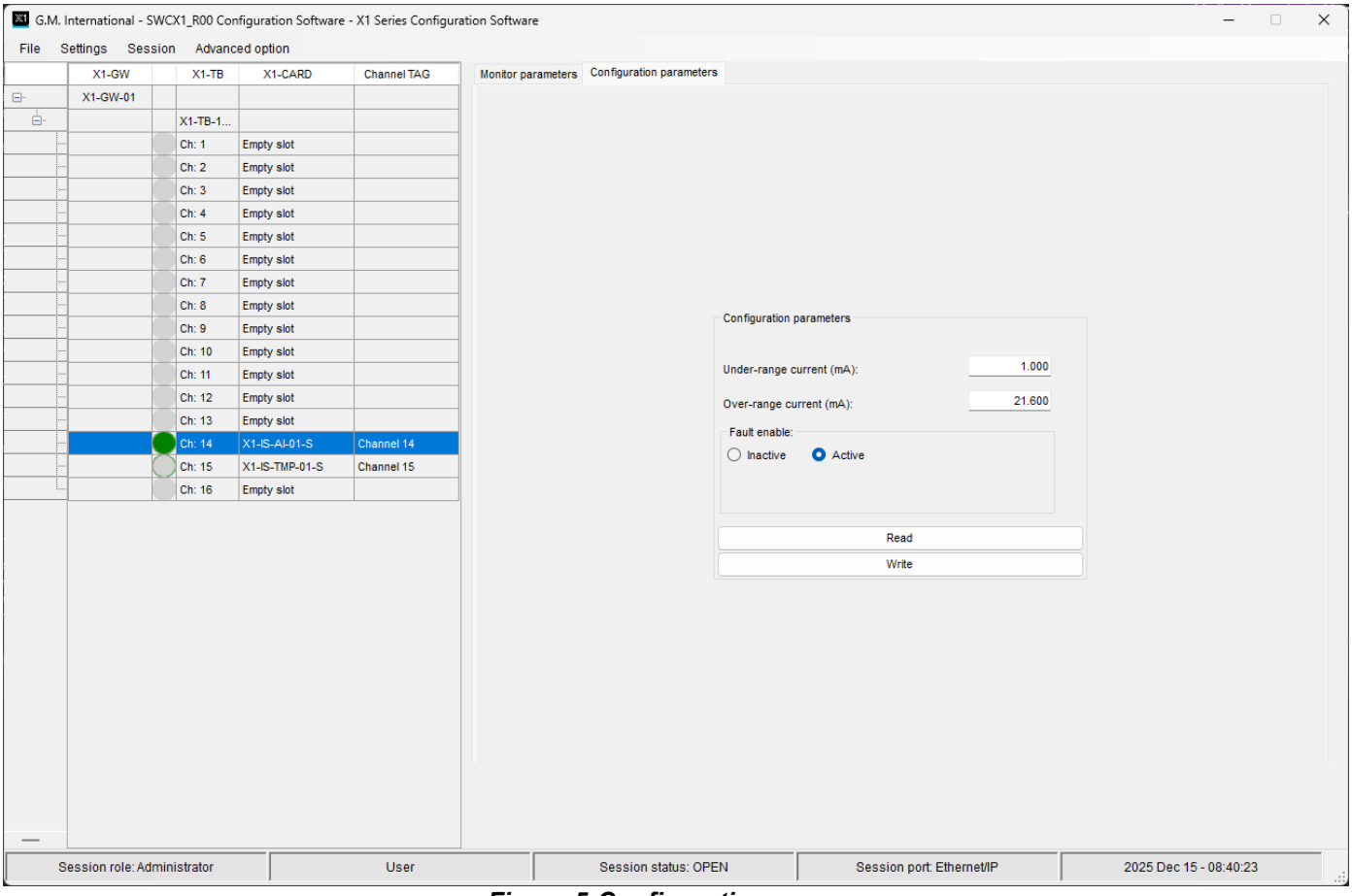

Figure 5:Configuration screen.

CONFIGURATION PARAMETERS

- **Fault enable:** (Out of range fault)
  - Inactive: fault condition is not triggered;

  - Active: fault condition is triggered.
- **Under-range current (mA):**
  - Low threshold for out-of-range fault issue.
- **Over-Range Current (mA):**
  - High threshold for out-of-range fault issue.

3.1.2 Monitor

The SWCX1 is able to continuously scan the module and display real-time values on screen.
Note that while the module is being monitored, configuration screens are disabled.

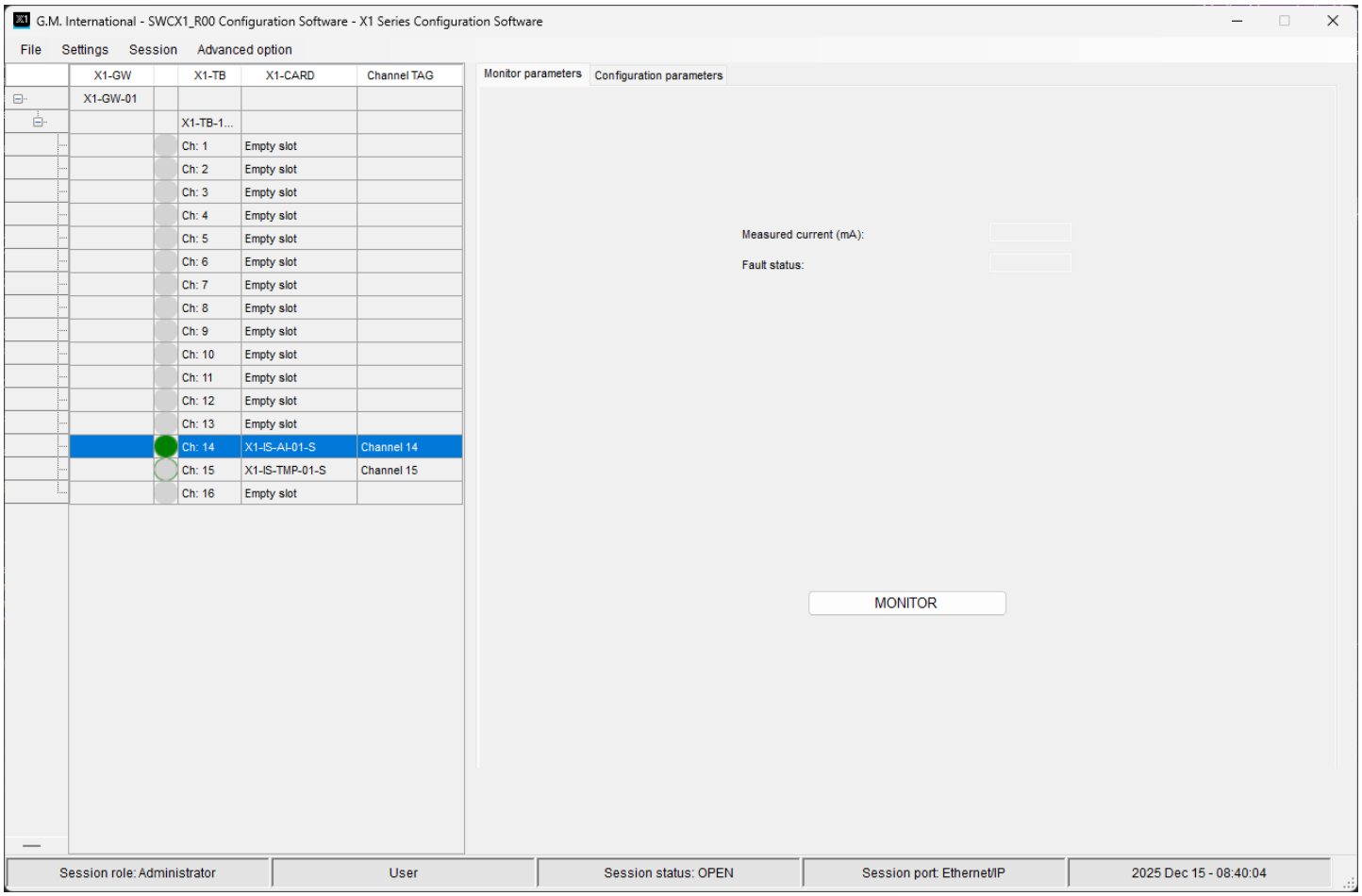

Figure 6: Monitor screen.

MONITOR PARAMETERS

- **Measured current:** Output current to the system AI card.
- **Fault status:** Status of the out-of-range fault.

3.2 X1-IS-UNI-01-S, X1-NIS-UNI-01-S

The Universal X1-IS-UNI-01-S module is a high integrity interface suitable for applications requiring up to SIL 3 (AI, DI, DO) or SIL 2 (AO) in safety related systems for high-risk industries.

- **Configuration**
- **Monitor**

3.2.1 Configuration

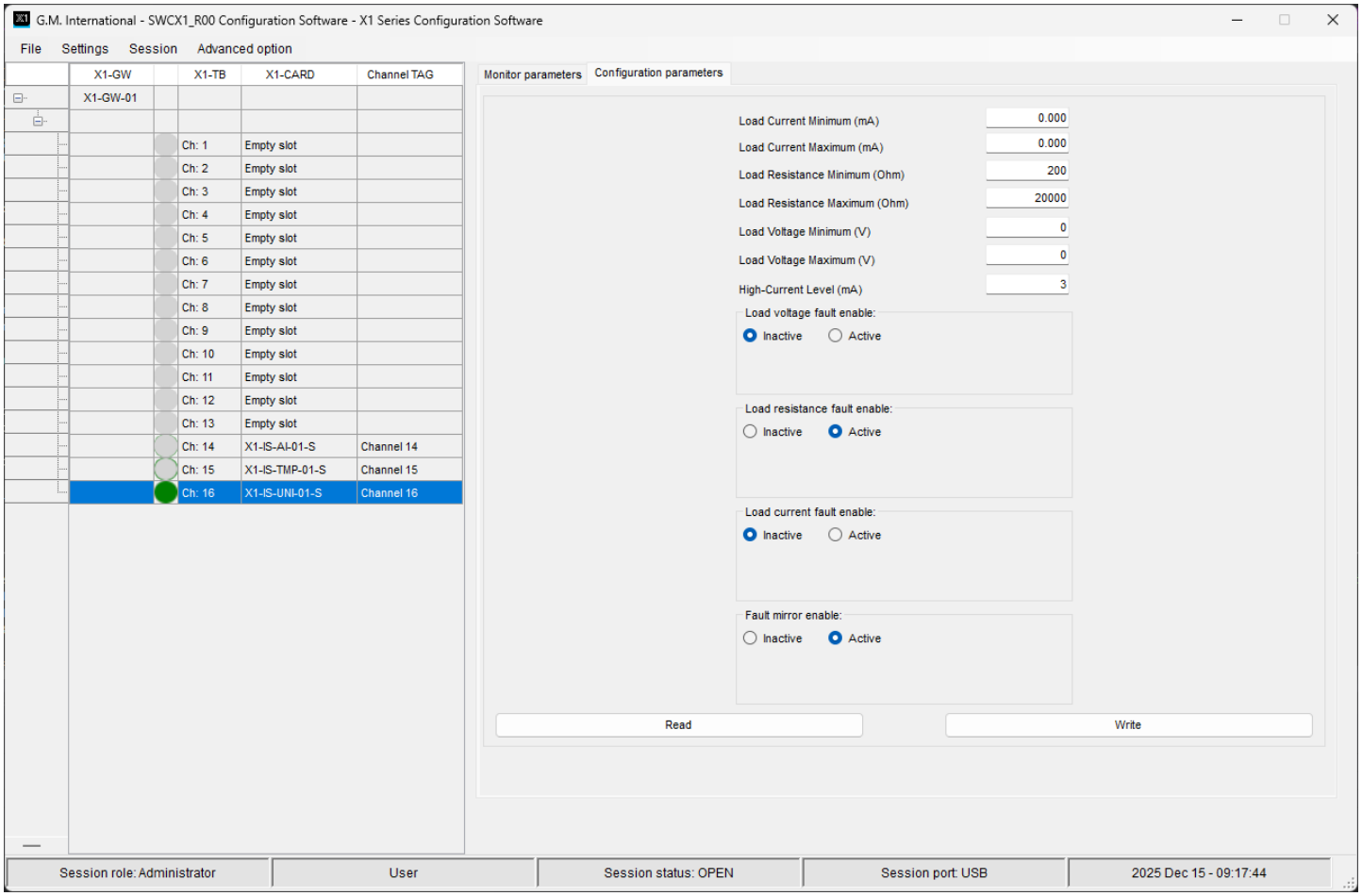

Figure 7:Configuration screen.

CONFIGURATION PARAMETERS

- **Load current minimum:** Load current minimum threshold (mA).
- **Load current maximum:** Load current maximum threshold (mA).
- **Load resistance minimum:** Load resistance minimum threshold (Ω).
- **Load resistance maximum:** Load resistance maximum threshold (Ω).
- **Load voltage minimum:** Load voltage minimum threshold (V).
- **Load voltage maximum:** Load voltage maximum threshold (V).
- **High current level:** System-side current (mA) associated to a field current above approximately 25 mA.
- **Load voltage fault enable:**
  - Inactive: fault condition is not triggered;
  - Active: fault condition is triggered.

- **Load resistance fault enable:**
  - Inactive: fault condition is not triggered;
  - Active: fault condition is triggered.
- **Load current fault enable:**
  - Inactive: fault condition is not triggered;
  - Active: fault condition is triggered.
- **Fault mirror enable:** The presence of the field fault can be mirrored to the I/O Card. When activated, the module transforms into high impedance towards the system.
  - Inactive: fault condition is not triggered;
  - Active: fault condition is triggered.

3.2.2 Monitor

The SWCX1 is able to continuously scan the module and display real-time values on screen.
Note that while the module is being monitored, configuration screens are disabled.

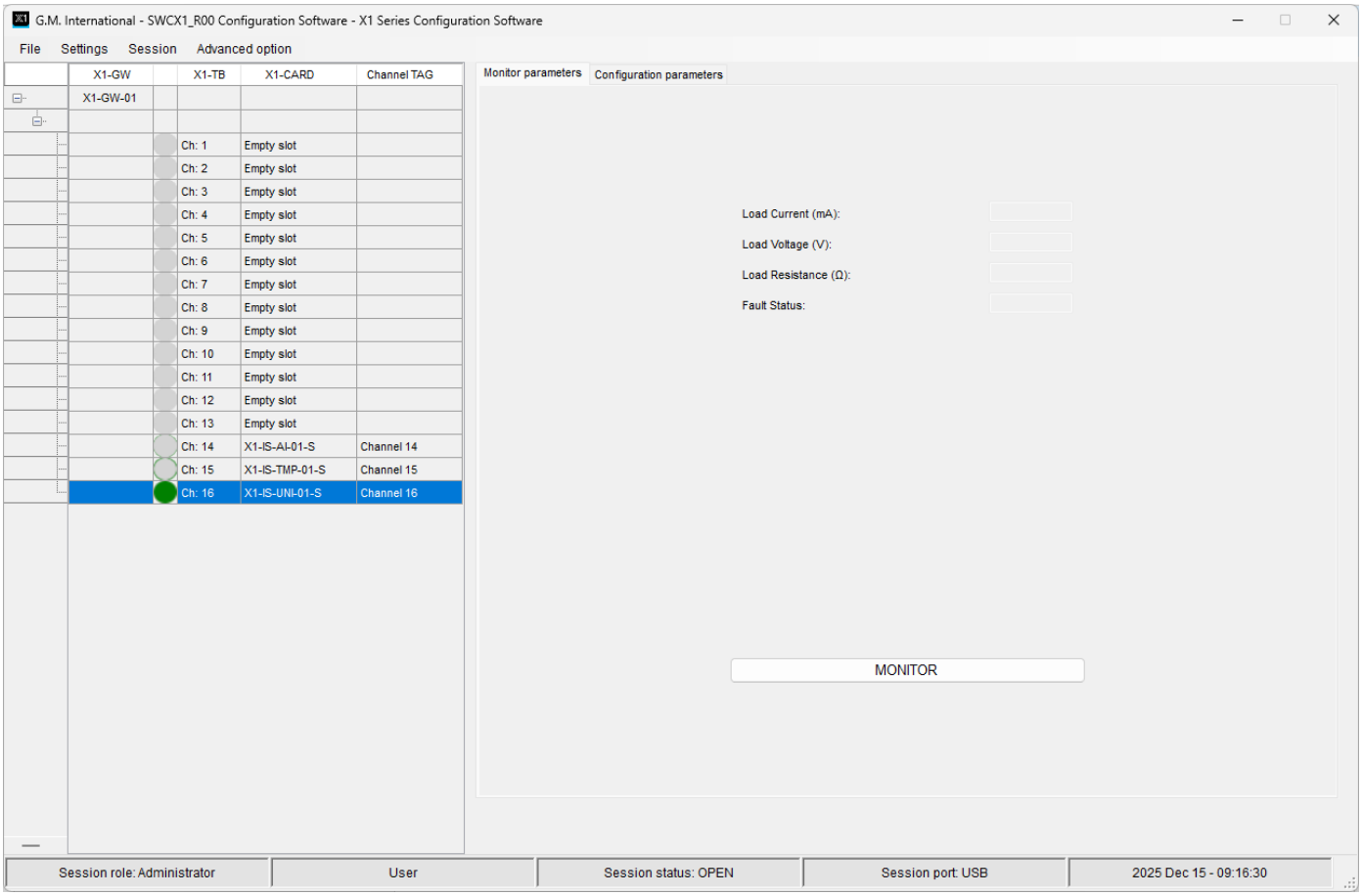

Figure 8: Monitor screen.

MONITOR PARAMETERS

- **Load current:** Load current (mA);
- **Load voltage:** Load voltage (V);
- **Load resistance**: Load resistance (Ω);
- **Fault status:** Current fault status.

3.3 X1-IS-AO-01-S, X1-IS-AO-02-S, X1-NIS-AO-01-S, X1-NIS-AO-02-S

The isolating driver module is a high integrity analog output interface suitable for applications requiring SIL 2 or SIL3 level in safety related level in safety related systems for high-risk industries.

- **Configuration**
- **Monitor**

3.3.1 Configuration

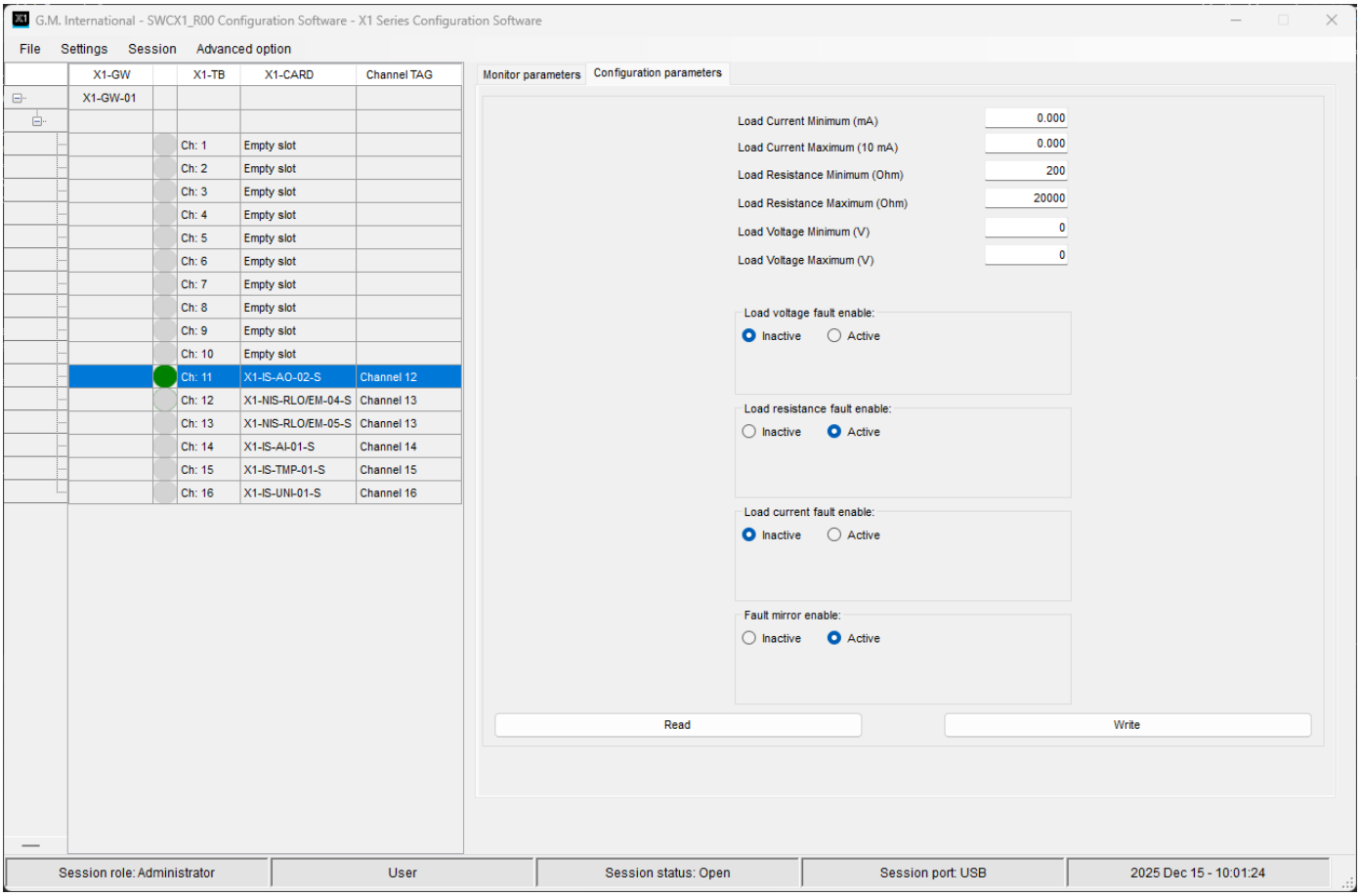

Figure 9:Configuration screen.

CONFIGURATION PARAMETERS

- **Load current minimum:** Load current minimum threshold (mA).
- **Load current maximum:** Load current maximum threshold (mA).
- **Load resistance minimum:** Load resistance minimum threshold (Ω).
- **Load resistance maximum:** Load resistance maximum threshold (Ω).
- **Load voltage minimum:** Load voltage minimum threshold (V).
- **Load voltage maximum:** Load voltage maximum threshold (V).
- **Load voltage fault enable:**
  - Inactive: fault condition is not triggered;
  - Active: fault condition is triggered.

- **Load resistance fault enable:**
  - Inactive: fault condition is not triggered;
  - Active: fault condition is triggered.
- **Load current fault enable:**
  - Inactive: fault condition is not triggered;
  - Active: fault condition is triggered.
- **Fault mirror enable:** The presence of the field fault can be mirrored to the I/O Card. When activated, the module transforms into high impedance towards the system.
  - Inactive: fault condition is not triggered;
  - Active: fault condition is triggered.

3.3.2 Monitor

The SWCX1 is able to continuously scan the module and display real-time values on screen.
Note that while the module is being monitored, configuration screens are disabled.

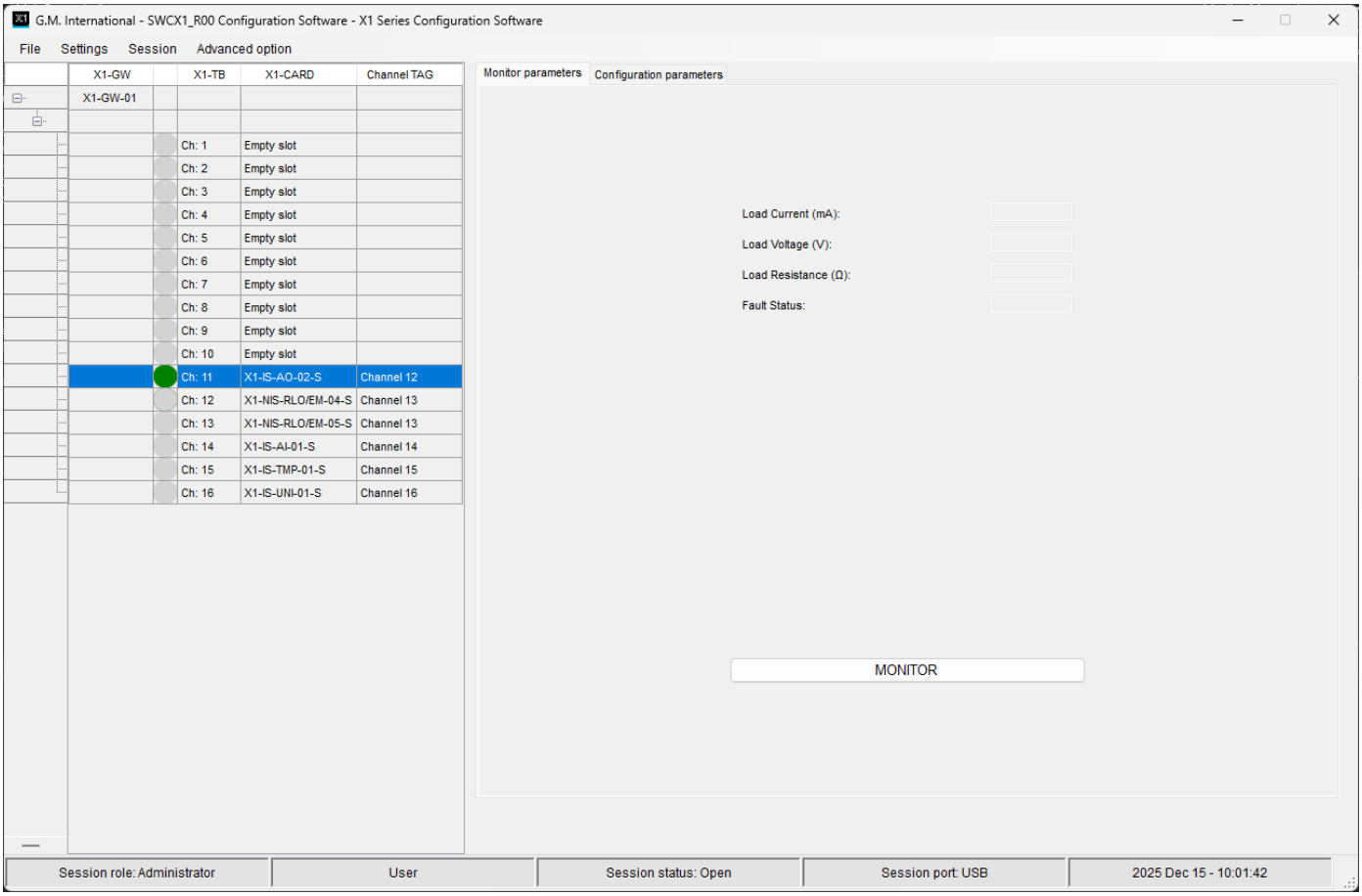

Figure 10: Monitor screen.

MONITOR PARAMETERS

- **Load current:** Load current (mA);
- **Load voltage:** Load voltage (V);
- **Load resistance**: Load resistance (Ω);
- **Fault status:** Current fault status.

3.4 X1-NIS-RLO/xx-04-S, X1-NIS-RLO/xx-05-S

The X1-NIS-RLO/EM-XX electro-magnetic (or X1-NIS-RLO/SS-XX solid-state) relay module is suitable for switching safety related circuits, up to SIL 3 level, for high-risk industries.

- **Configuration**
- **Monitor**

3.4.1 Configuration

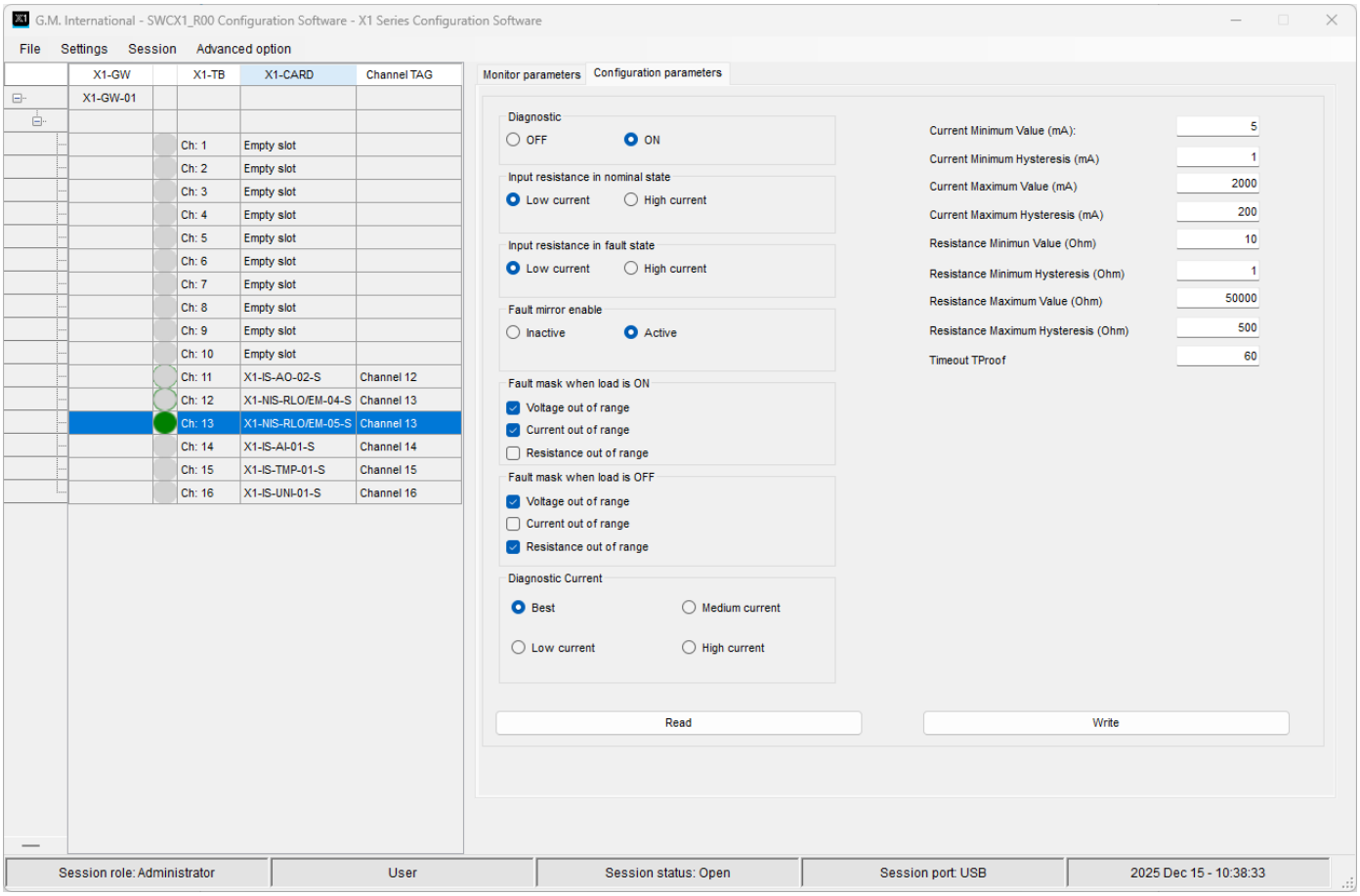

Figure 11:Configuration screen.

CONFIGURATION PARAMETERS

- **Diagnostic:**
  - OFF: Field diagnostic disable;
  - ON: Field diagnostic enable
- **Input resistance in nominal state:**
  - Low current;
  - High current.
- **Input resistance in fault state:**
  - Low current;
  - High current.

- **Fault mirror enable:** The presence of the field fault can be mirrored to the I/O Card. When activated, the module transforms into high impedance towards the system.
  - Inactive;
  - Active.
- **Fault mask when fault is ON:**
  - Voltage out of range;
  - Current out of range;
  - Resistance out of range.
- **Fault mask when fault is OFF:**
  - Voltage out of range;
  - Current out of range;
  - Resistance out of range.
- **Diagnostic current** (Diagnostics current forced by the relay module to the load in OFF state can be changed):
  - Best;
  - Low current;
  - Medium current;
  - High current
- **Current minimum value:** Load current minimum threshold value (mA).
- **Current minimum hysteresis:** Load current minimum threshold hysteresis (mA).
- **Current maximum value:** Load current maximum threshold value (mA).
- **Current maximum hysteresis:** Load current maximum threshold hysteresis (mA).
- **Resistance minimum value:** Load resistance minimum threshold value (Ω).
- **Resistance minimum hysteresis:** Load resistance minimum threshold hysteresis (Ω).
- **Resistance maximum value:** Load resistance maximum threshold value (Ω).
- **Resistance maximum hysteresis:** Load resistance maximum threshold hysteresis (Ω).
- **Time out T-proof:** When the t-proof automatic test procedure is activated and no operation is performed, the module automatically exits the procedure when the timeout period expires.

3.4.2 Monitor

The SWCX1 is able to continuously scan the module and display real-time values on screen.
Note that while the module is being monitored, configuration screens are disabled.

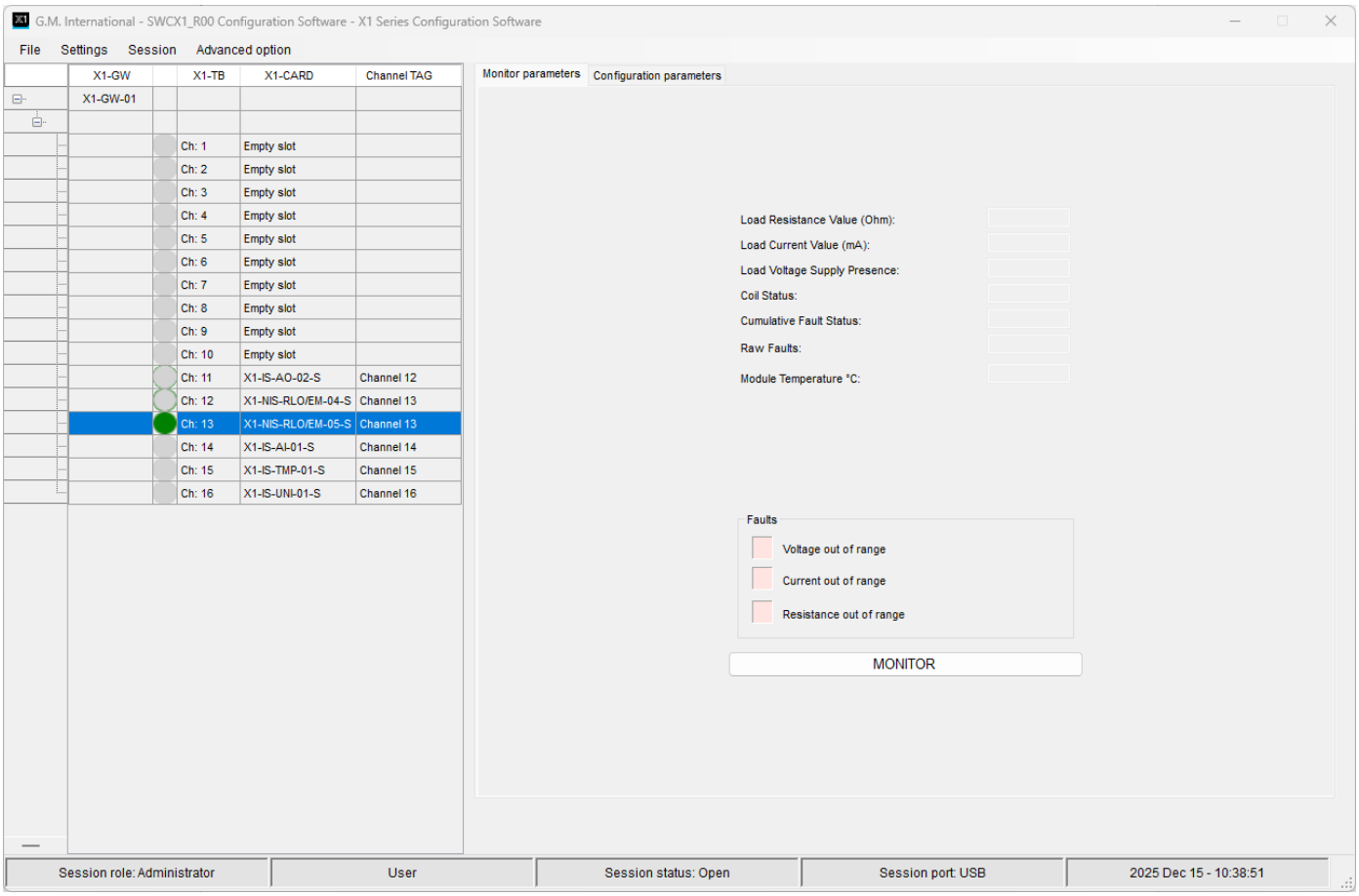

Figure 12: Monitor screen.

MONITOR PARAMETERS

- **Load resistance value:** Load resistance (Ω);
- **Load current value:** Current on the load (mA);
- **Load voltage presence supply**: Presence of voltage in the field (V);
- **Coil status:** Status of the input driver;
- **Cumulative fault status:** Presence of a fault in the field;
- **Raw faults** (Specific origin of the fault):
  - 1: Voltage out of range;
  - 2: Current out of range;
  - 4: Resistance out of range.
- **Module temperature:** Temperature measured inside the module (°C);
- **Fault** (Raw Faults crosschecked towards the configured Fault Masks):
  - Voltage out of range;
  - Current out of range;
  - Resistance out of range.

3.4.3 Proof test procedure

The automatic proof test is available only for models X1-NIS-RLO/SS-04-S and X1-NIS-RLO/SS-05-S, when the access role is administrator.

3.4.3.1 X1-NIS-RLO/SS-04-S module with input to output direct signal transfer and input line fault detection enabled.

Step 1:
The module requires a X1 Series Termination Board (X1-TB) to operate and to connect to field device and to safety-related PLC system. In addition, X1 Gateway module (X1-GW) must be present to X1-TB and it must be connected to Workstation/PC by (USB or Ethernet or Modbus RS485) to configure and monitor the RLO module under test by SWCX1 software installed on Workstation/PC.
By Safety PLC, take appropriate action to avoid detection of a malfunctioning on the SIF where RLO module is operating.
Change the field load with an equivalent one (in terms of resistance and voltage / current / power operating)

- **Step 2:**
Considering that equivalent field load is normally energized (because Safety PLC energizes system input loop to RLO module), on SWCX1 main window choose “Advanced options” entry, then “T-proof” selection to start the Proof test by pressing “Test” button of related RLO module.
The T-proof procedure tests independently both solid state relay contacts and it releases a T-proof test report with PASS or FAIL result as test validation.
With PASS result, RLO module operates correctly and passes step 2 of Proof test.
Instead, with FAIL result, RLO module is not correctly operating according to a demand from the process (presence of dangerous failure) and it must be changed with a new RLO module.
- **Step 3:**
If RLO module passes the step 2 of Proof test, disconnect the equivalent field load and restore normal field load.
By Safety PLC, re-establish normal operation (including detection of malfunctioning) on the SIF where RLO module is operating.

3.4.3.2 X1-NIS-RLO/SS-05-S module with input to output direct signal transfer and input line fault detection enabled.

- **Step 1:**
The module requires a X1 Series Termination Board (X1-TB) to operate and to connect to field device and to safety-related PLC system. In addition, X1 Gateway module (X1-GW) must be present to X1-TB and it must be connected to Workstation/PC by (USB or Ethernet or Modbus RS485) to configure and monitor the RLO module under test by SWCX1 software installed on Workstation/PC.
By Safety PLC, take appropriate action to avoid detection of a malfunctioning on the SIF where RLO module is operating.
Change the field load with an equivalent one (in terms of resistance and voltage / current / power operating).
- **Step 2:**
Considering that equivalent field load is normally de-energized (because Safety PLC de-energizes system input loop to RLO module), on SWCX1 main window choose “Advanced options” entry, then “T-proof” selection to start the Proof test by pressing “Test” button of related RLO module.
The T-proof procedure tests independently all solid state relay contacts and it releases a T-proof test report with PASS or FAIL result as test validation.
With PASS result, RLO module operates correctly and passes step 2 of Proof test.
Instead, with FAIL result, RLO module is not correctly operating according to a demand from the process (presence of dangerous failure) and it must be changed with a new RLO module.
- **Step 3:**
If RLO module passes the step 2 of Proof test, disconnect the equivalent field load and restore normal field load. By Safety PLC, re-establish normal operation (including detection of malfunctioning) on the SIF where RLO module is operating.

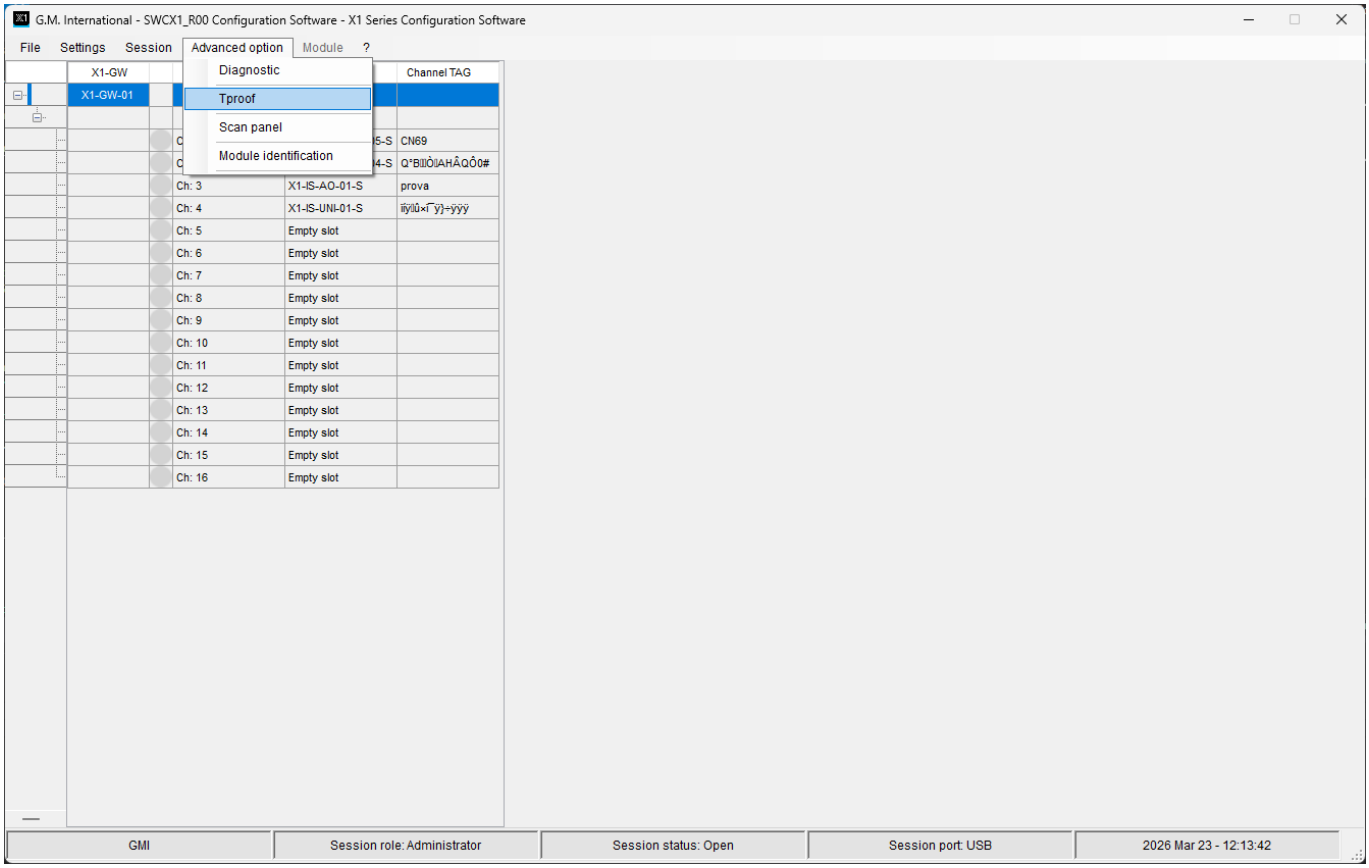

Figure 13: Advanced option

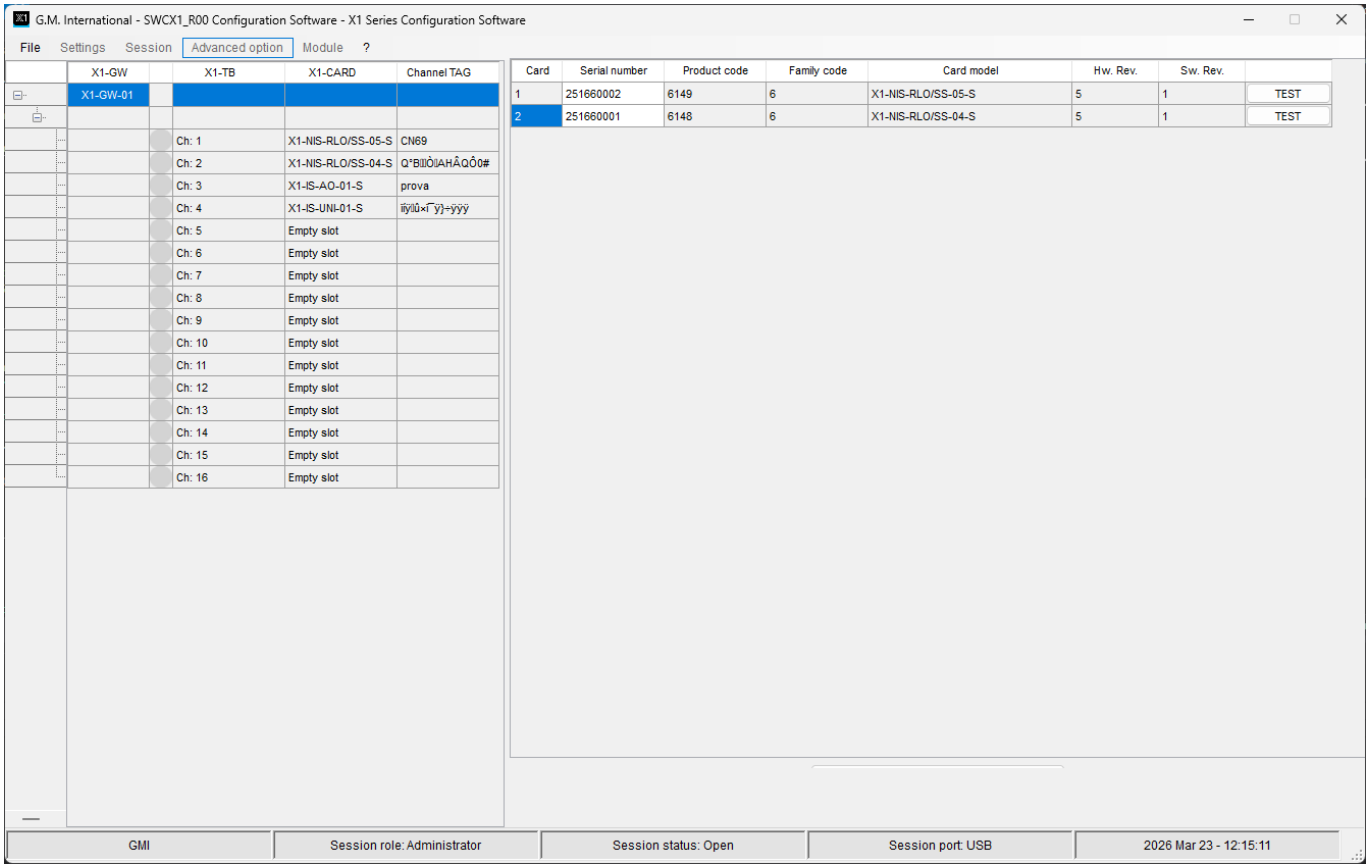

Figure 14: Proof test module selection

3.5 X1-IS-DI-02-S, X1-NIS-DI-02-S

The Switch/Proximity detector repeater is a module suitable for applications requiring SIL 2 level in safety related systems for high-risk industries.

- **Configuration**
- **Monitor**

3.5.1 Configuration

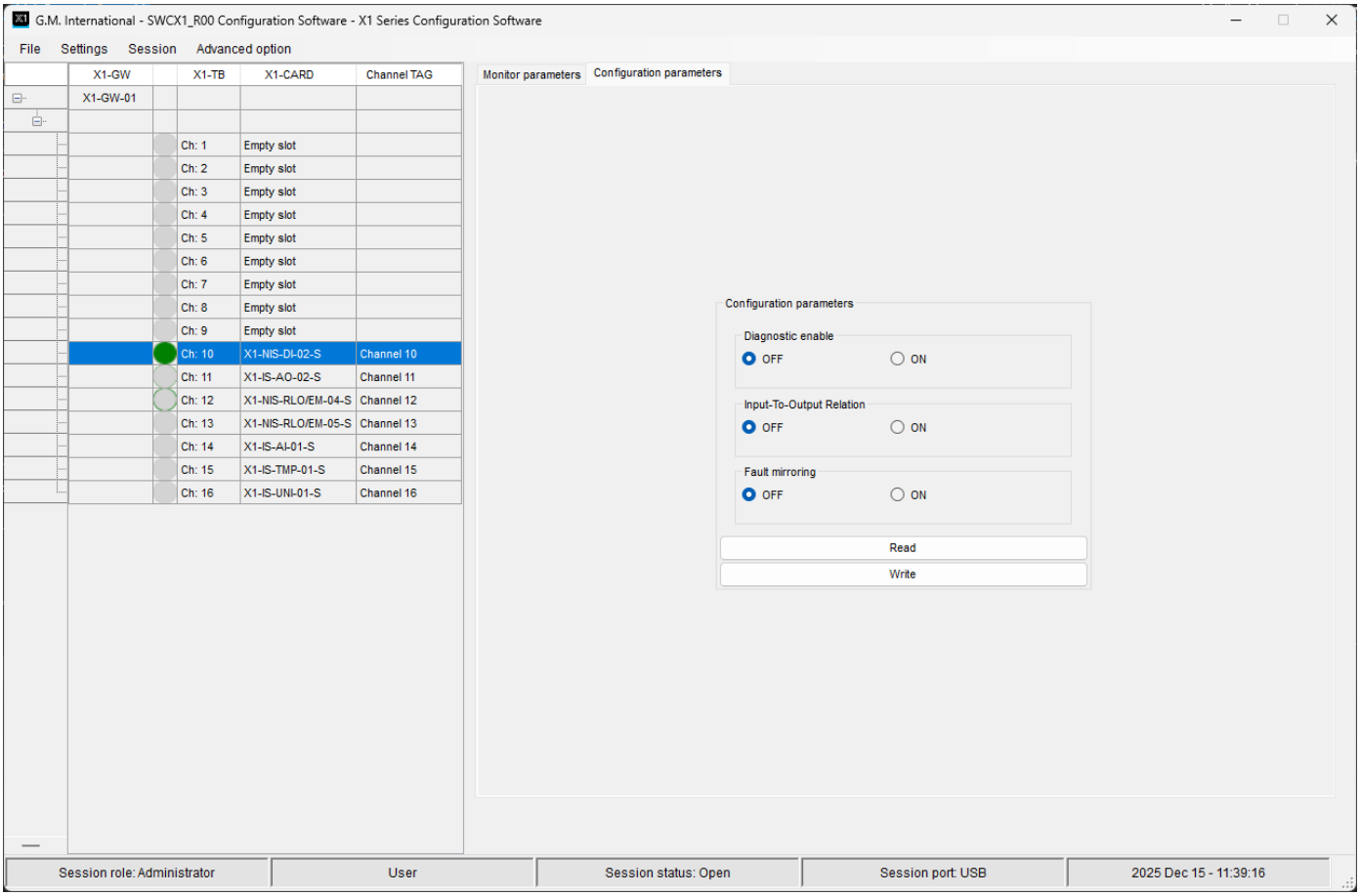

Figure 15:Configuration screen.

CONFIGURATION PARAMETERS

- **Diagnostic enable:**
  - OFF: Field diagnostic disable;
  - ON: Field diagnostic enable
- **Input to output relation** (Correspondence between input and output state):
  - OFF: Direct relation;
  - ON: Inverse relation.
- **Fault mirroring:** (Output fault in case of fault)
  - OFF: No fault mirroring;
  - ON: Output open in case of fault

3.5.2 Monitor

The SWCX1 is able to continuously scan the module and display real-time values on screen.
Note that while the module is being monitored, configuration screens are disabled.

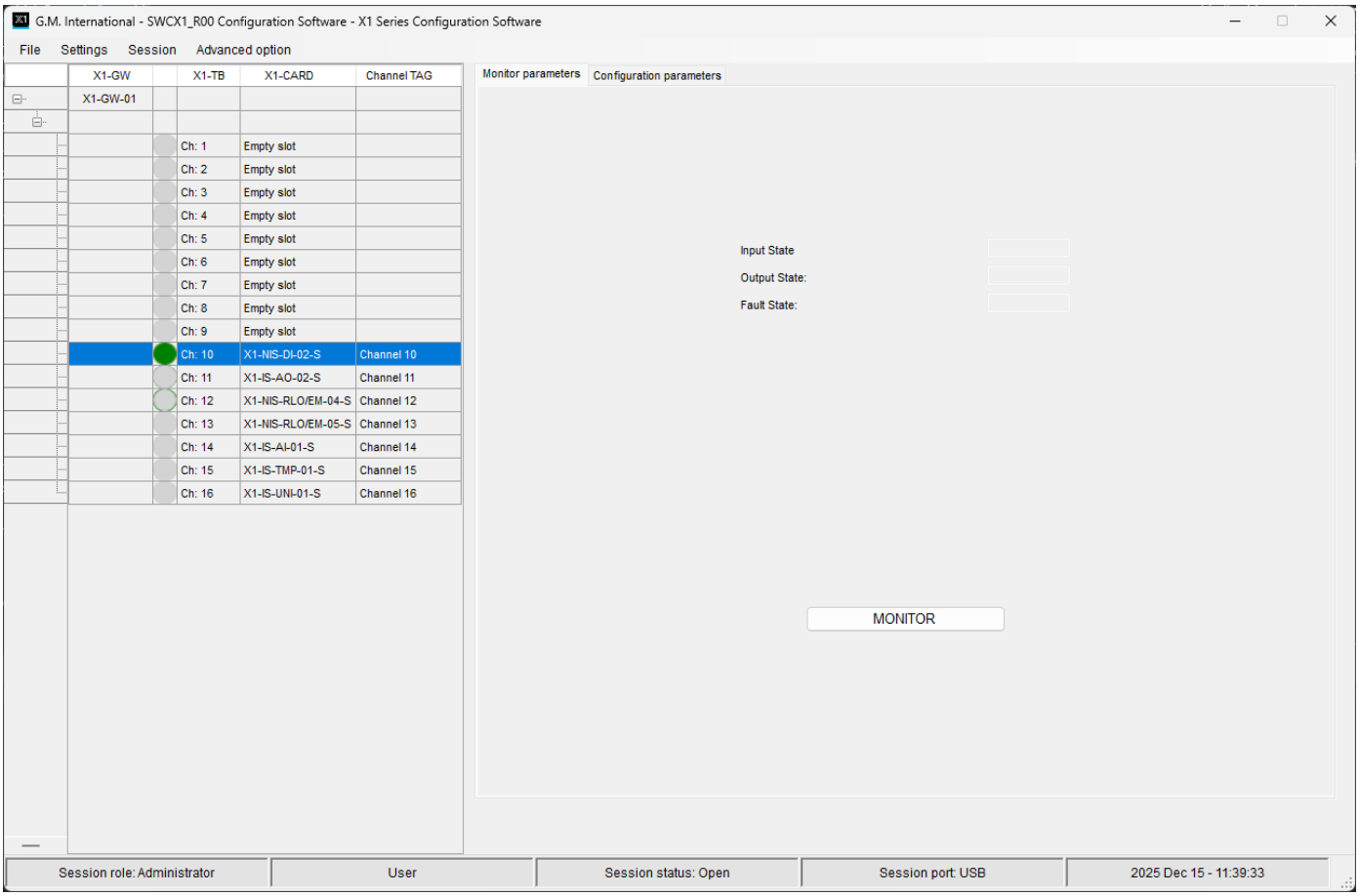

Figure 16: Monitor screen.

MONITOR PARAMETERS

- **Input state:**
  - 0: Open circuit;
  - 1: Low current;
  - 2: High current;
  - 3: Short circuit.
- **Output state:**
  - 0: Closed;
  - 1: Open.
- **Fault state:**
  - 0: Fault active;
  - 1: Fault inactive.

3.6 X1-IS-DO-01-S, X1-NIS-DO-01-S

The Digital output driver module is suitable for energizing safety related circuits, up to SIL 3 level, for high-risk industries.

- **Monitor**

3.6.1 Monitor

The SWCX1 is able to continuously scan the module and display real-time values on screen.
Note that while the module is being monitored, configuration screens are disabled.

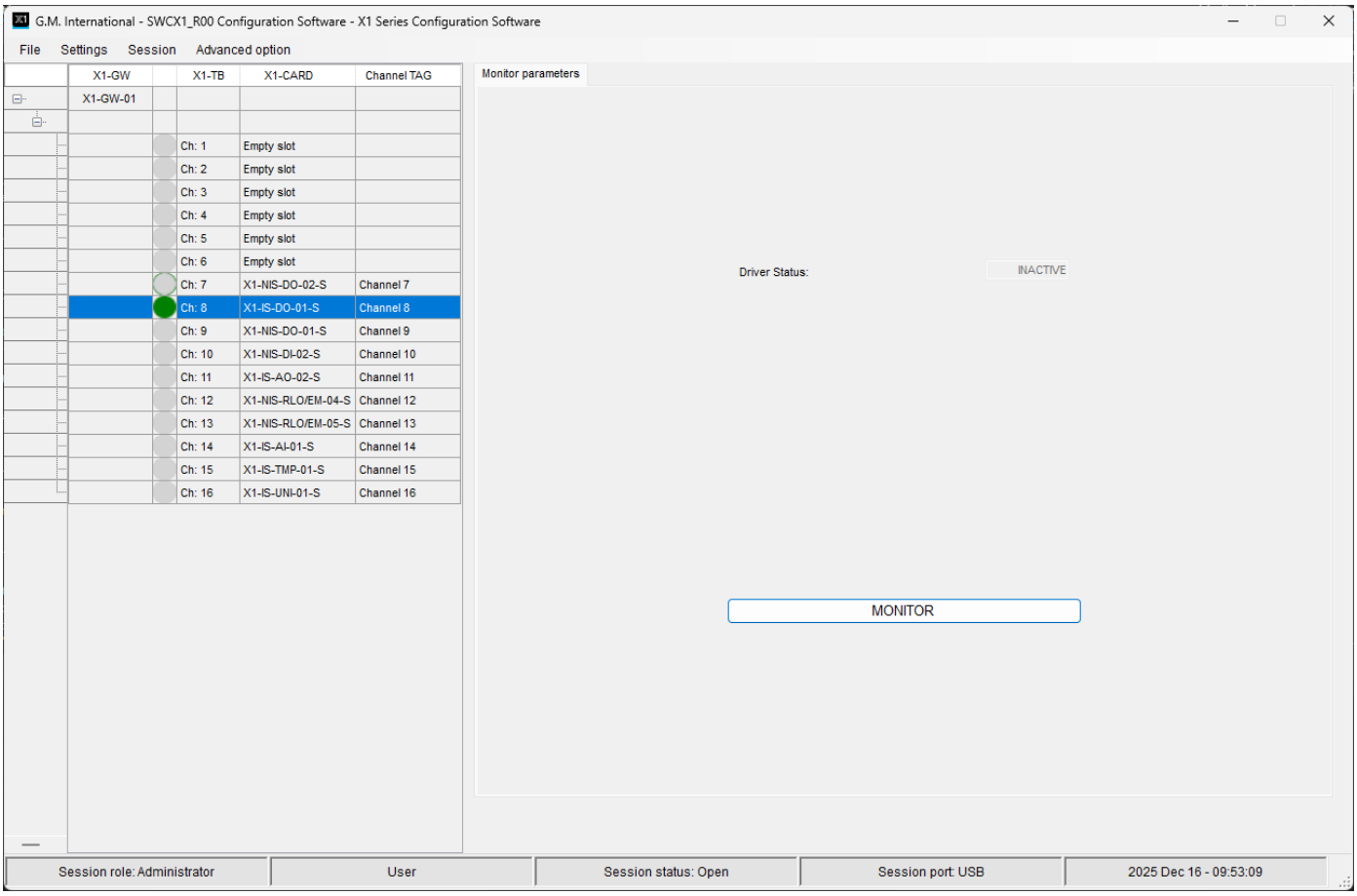

Figure 17:Monitor screen.

CONFIGURATION PARAMETERS

- **Driver status**: Status of the input driver.

3.7 X1-IS-DO-02-S, X1-NIS-DO-02-S

The Digital output driver module is suitable for energizing safety-related circuits, up to SIL 3 level, for high-risk industries.

- **Configuration**
- **Monitor**

3.7.1 Configuration

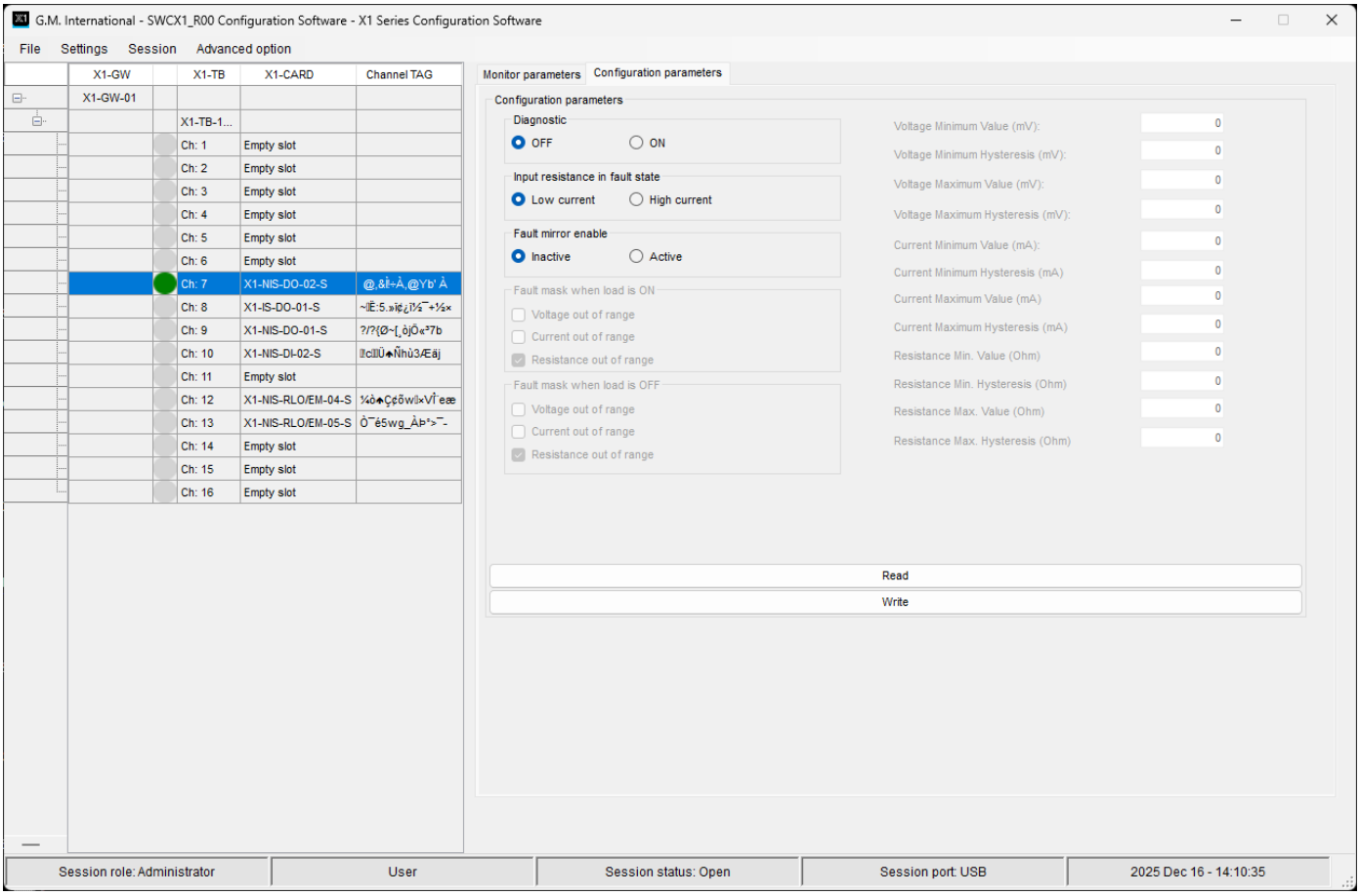

Figure 18:Configuration screen.

CONFIGURATION PARAMETERS (for modules X1-IS-DO-02 and X1-NIS-DO-02)

- **Diagnostic enable:**
  - OFF: Field diagnostic disable;
  - ON: Field diagnostic enable.
- **Input resistance in fault state** (Correspondence between input and output state):
  - LOW CURRENT: Input resistance value set to 50 kΩ;
  - HIGH CURRENT: Input resistance value set to 3.5 kΩ.
- **Fault mirror enable:** The presence of the field fault can be mirrored to the I/O Card. When activated, in case of fault the module transforms into high impedance (see Input Resistance in Fault State) towards the system:
  - INACTIVE;
  - ACTIVE.

CONFIGURATION PARAMETERS (only for the X1-IS-DO-02 module)

- **Fault mask when load is ON:**
  - Voltage out of range;
  - Current out of range;
  - Resistance out of range.
- **Fault mask when load is OFF:**
  - Voltage out of range;
  - Current out of range;
  - Resistance out of range.
- **Voltage minimum value:** Load voltage minimum threshold value (mV).
- **Voltage minimum hysteresis:** Load voltage minimum threshold hysteresis (mV).
- **Voltage maximum value:** Load voltage maximum threshold value (mV).
- **Voltage maximum hysteresis:** Load voltage maximum threshold hysteresis (mV).
- **Current minimum value:** Load current minimum threshold value (mA).
- **Current minimum hysteresis:** Load current minimum threshold hysteresis (mA).
- **Current maximum value:** Load current maximum threshold value (mA).
- **Current maximum hysteresis:** Load current maximum threshold hysteresis (mA).
- **Resistance minimum value:** Load resistance minimum threshold value (Ω).
- **Resistance minimum hysteresis:** Load resistance minimum threshold hysteresis (Ω).
- **Resistance maximum value:** Load resistance maximum threshold value (Ω).
- **Resistance maximum hysteresis:** Load resistance maximum threshold hysteresis (Ω).

3.7.2 Monitor

The SWCX1 is able to continuously scan the module and display real-time values on screen.
Note that while the module is being monitored, configuration screens are disabled.

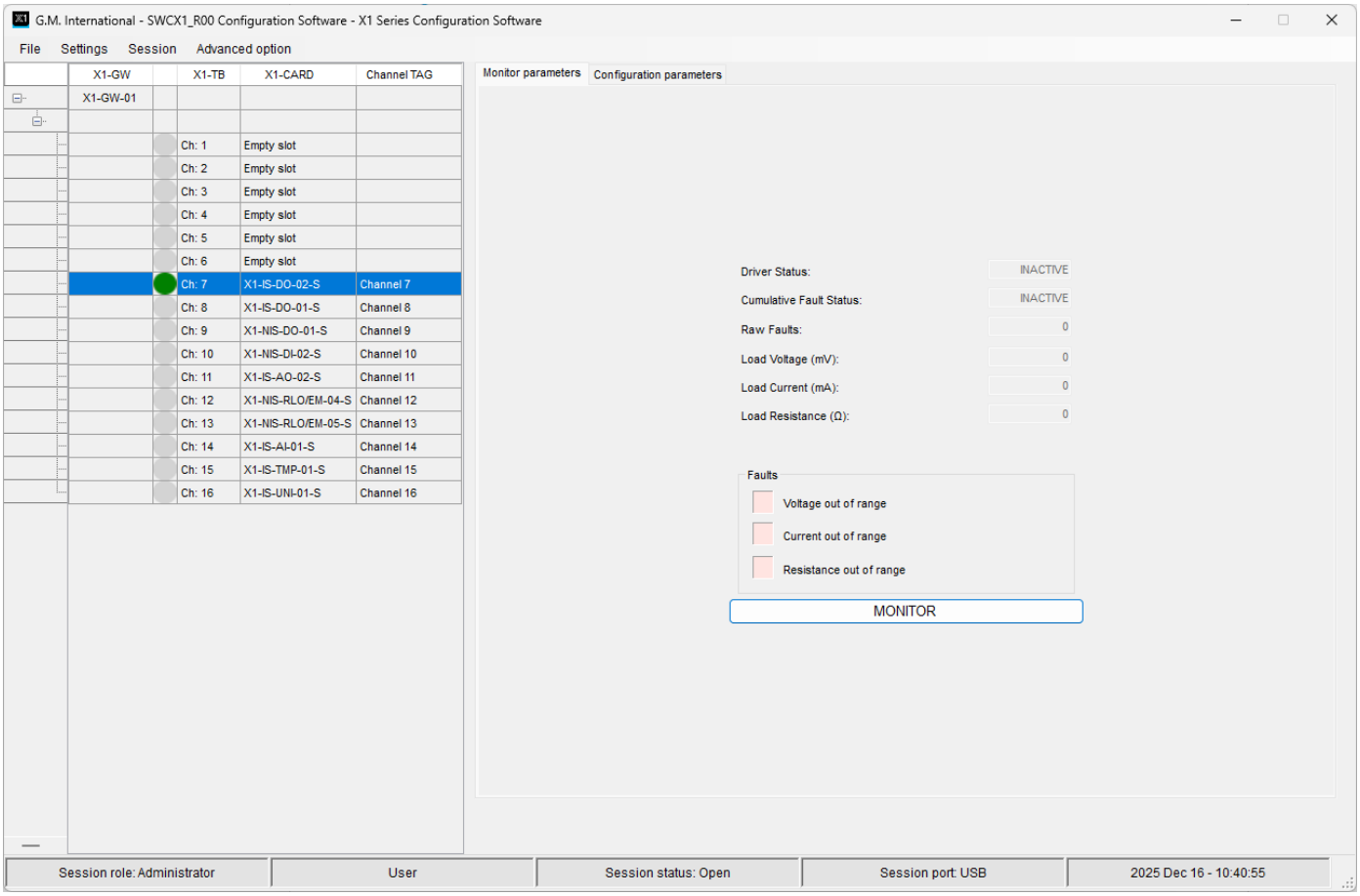

Figure 19: Monitor screen.

MONITOR PARAMETERS (for modules X1-IS-DO-02 and X1-NIS-DO-02)

- **Driver status:** Status of the input driver;
- **Cumulative faults:** Presence of a fault in the field.

MONITOR PARAMETERS (only for the X1-IS-DO-02 module)

- **Raw faults** (Specific origin of the fault):
  - 1: Voltage out of range;
  - 2: Current out of range;
  - 4: Resistance out of range.
- **Load voltage:** Voltage on the load (mV);
- **Load current:** Current on the load (mA);
- **Load resistance:** Load resistance (Ω);
- **Fault** (Raw Faults crosschecked towards the configured Fault Masks):
  - Voltage out of range;
  - Current out of range;
  - Resistance out of range.

3.8 X1-IS-TMP-01-S, X1-NIS-TMP-01-S

The Temperature Converter module accepts a low level dc signal from millivolt, thermocouple or 2/3/4-wire resistance/RTD or transmitting potentiometer sensor, located in Hazardous Area.

- **Configuration**
- **Monitor**

3.8.1 Configuration

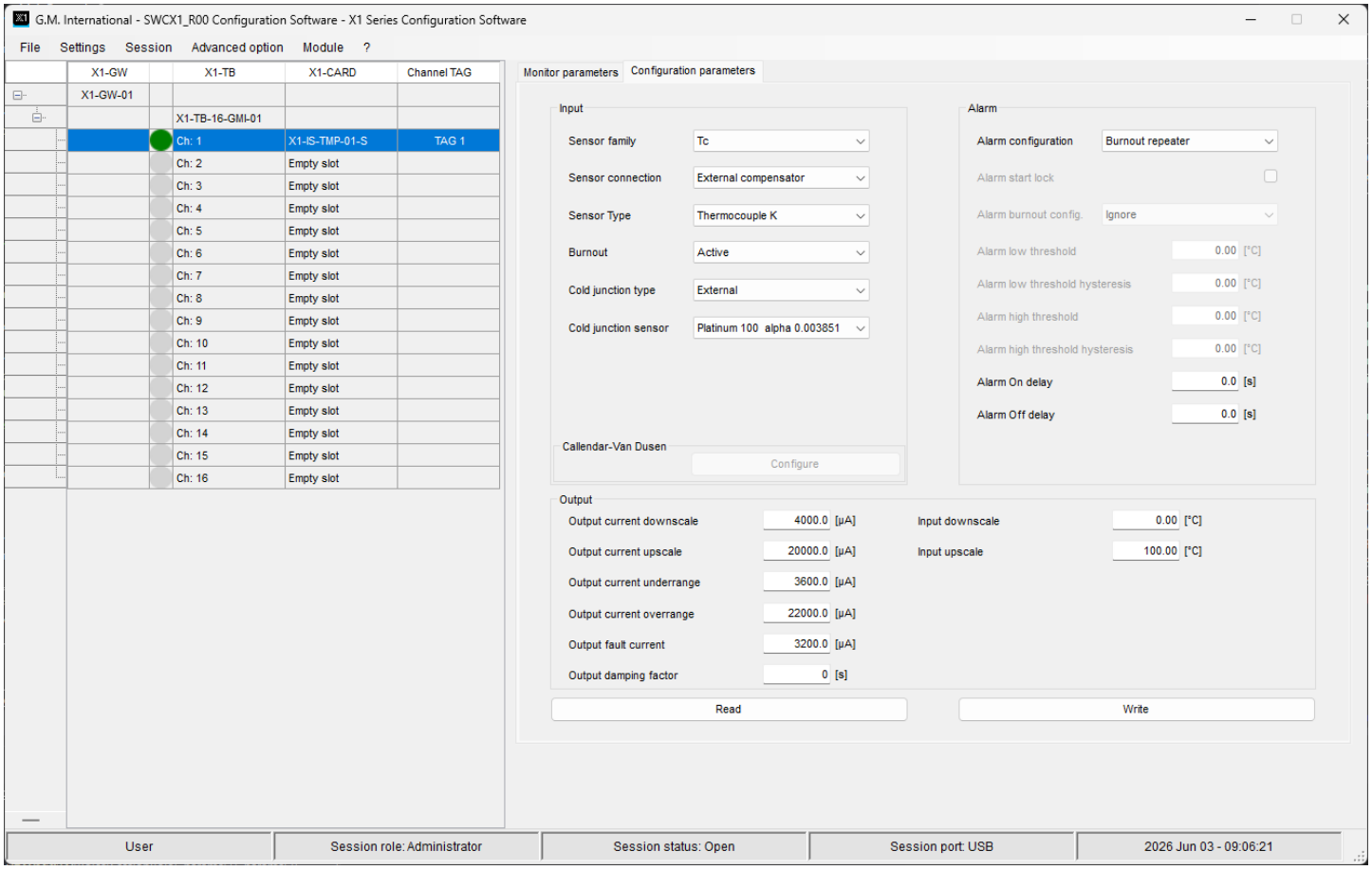

Figure 20:Configuration screen.

CONFIGURATION PARAMETERS
INPUT

- **Sensor family:**
  - Tc;
  - RTD;
  - Voltage;
  - Resistance;
  - Potentiometer.
- **Sensor connection**
  - 2 wires selection or External compensator for Tc input;
  - 2,3,4 wires selection for RTD/Resistance inputs;
  - 2 wires selection for Voltage input;
  - 3 wires selection for Potentiometer input.

- **Sensor Type:** list of available input sensors.
- **Burnout:**
  - **Active:** when selected burnout fault condition is triggered;
  - **Inactive:** when selected burnout fault condition is not triggered.
- **Cold junction type:** reference junction compensation type (thermocouple only)
  - **Off:** via internal compensator;
  - **Fixed:** programmable temperature compensation at fixed temperature;
  - **External:** available when the selected *Sensor Type* is “External compensator”.
- **Cold junction sensor:** list of available external sensors. (Available when the selected *Sensor Type* is “External compensator”.)
- **Cold junction fixed value:** cold junction temperature in 0.01°C to be used only when the Cold Junction Type is fixed.
- **Callendar-Van Dusen:** equation that describes the relationship between resistance (R) and temperature (T) of RTD. (Available when selecting the RTD Sensor Family and the Callendar-Van Dusen Sensor Type.)
- **Two-wire cable resistance:** cable resistance in mΩ to be subtracted from the measure. Used only when the selected input sensor is an RTD or a RESISTANCE sensor configured for a two-wire connection.
- **Multiplier:** a multiplicative value to be applied to the RTD measure before converting it to temperature.

OUTPUT

- **Output Current Downscale:** output current value (100 nA) corresponding to the Input Downscale value.
- **Output Current Upscale:** output current value (100 nA) corresponding to the Input Upscale value.
- **Output Current Underrange:** minimum output current value (100 nA) below the downscale.
- **Output Current Overrange:** maximum output current value (100 nA) above the upscale.
- **Output Fault Current**: output current value (100 nA) in case of fault.
- **Output Damping Factor:** damping factor (1st order filter) on the output current, expressed in second
- **Input Downscale:** input value, expressed in 0.01 °C, 100 nV, mΩ, ppm depending on sensor and configuration, corresponding to the Output Current Downscale, typically 4 mA.
- **Input Upscale:** input value, expressed in 0.01 °C, 100 nV, mΩ, ppm depending on sensor and configuration, corresponding to the Output Current Upscale, typically 20 mA.

ALARM

- **Alarm Configuration:** the alarm can be configured as:
  - **None:** alarm is disabled;
  - **Low:** alarm is triggered when source descends below “Low Threshold”;
  - **High:** alarm is triggered when source ascends above “High Threshold”;
  - **Window:** alarm is triggered below “Low Threshold” and above “High Threshold”;
  - **Burnout repeater:** alarm is triggered each time the burnout condition is present.
- **Alarm Start Lock:** alarm is inhibited until source ascends over “Low Threshold or descends below “High Threshold, and then it behaves as a standard “Low” or “High” configuration.
- **Alarm Burnout Configuration:** in case of input burnout:
  - **Ignore:** alarm is not affected;
  - **Lock:** remains in the same status as it was before Fault occurred;
  - **Alarm active:** alarm is triggered;
  - **Alarm inactive:** alarm is not triggered.

- **Alarm Low Threshold:** input value, expressed in 0.01 °C, 100 nV, mΩ, ppm depending on sensor and configuration, below which the alarm should be asserted.
- **Alarm Low Threshold Hysteresis:** hysteresis, expressed in 0.01 °C, 100 nV, mΩ, ppm depending on sensor and configuration, to be applied to the Alarm Low Threshold before removing the alarm.
- **Alarm High Threshold:** input value, expressed in 0.01 °C, 100 nV, mΩ, ppm depending on sensor and configuration, above which the alarm should be asserted.
- **Alarm High Threshold Hysteresis:** hysteresis, expressed in 0.01 °C, 100 nV, mΩ, ppm depending on sensor and configuration, to be applied to the Alarm High Threshold before removing the alarm.
- **Alarm ON Delay:** delay expressed in 100ms step from the alarm trigger to the actual alarm execution. Note that, if the alarm triggers before the full delay has elapsed, the alarm must not pop up.
- **Alarm OFF Delay:** delay expressed in 100ms step from the alarm trigger disappearance to the actual alarm switch off. Note that, if the alarm trigger disappears before the full delay has elapsed, the alarm must not fail.

3.8.2 Monitor

The SWCX1 is able to continuously scan the module and display real-time values on screen.
Note that while the module is being monitored, configuration screens are disabled.

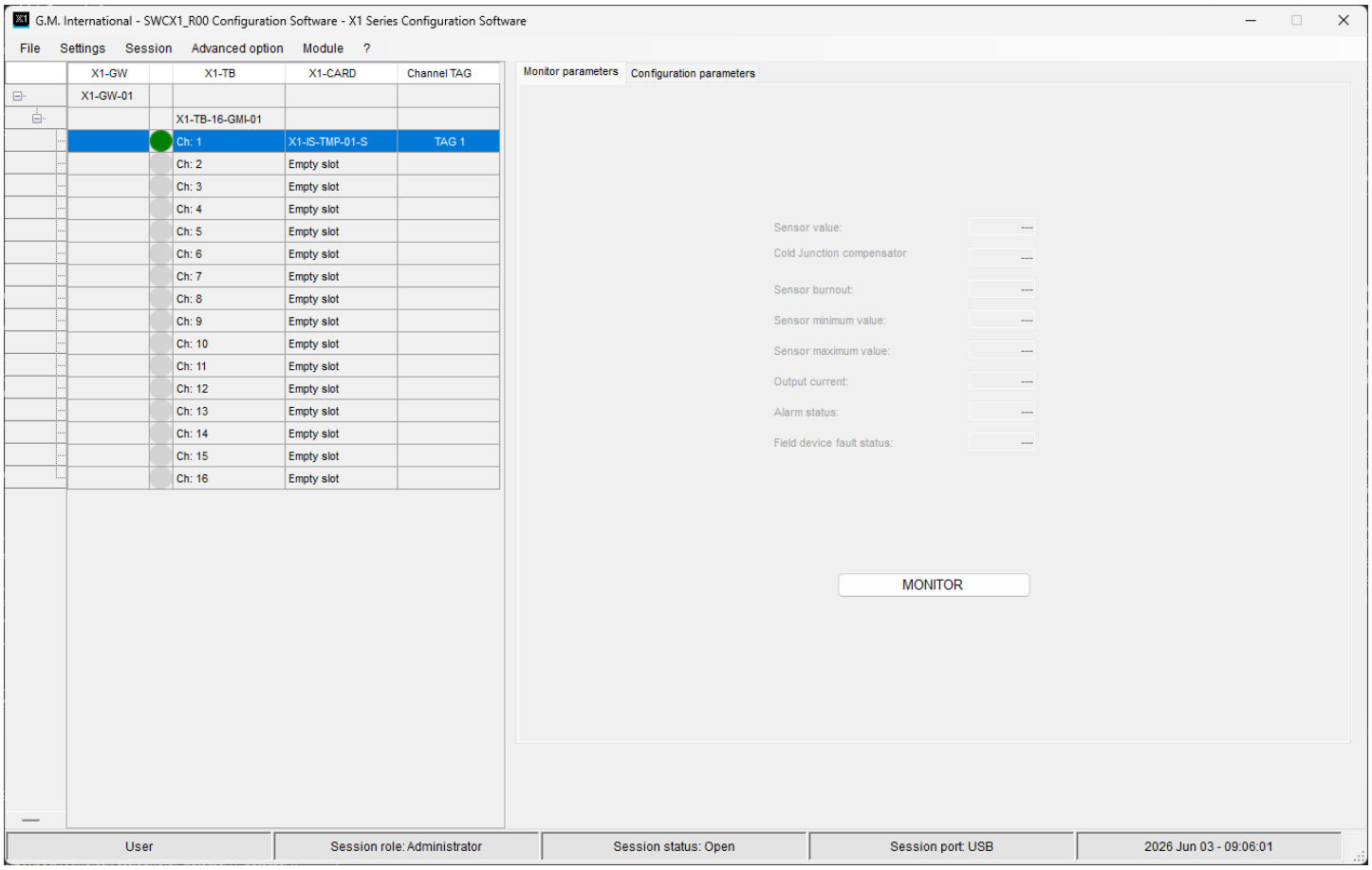

Figure 21: Monitor screen.

MONITOR PARAMETERS

The module allows monitoring of the following parameters

- **Sensor Value:** expressed in 0.01 °C (tc, RTD), 100 nV (mV), mΩ (res), ppm (pot).
- **Cold Junction Compensator:** expressed in 0.01 °C.
- **Sensor Burnout:** sensor burnout on any wire (0: absent, 1: present).
- **Sensor Minimum Value**: input sensor minimum value since last reset.
- **Sensor Maximum Value:** input sensor maximum value since last reset.
- **Output Current:** output current expressed in 100 nA.
- **Alarm status:** alarm condition (0: absent, 1: present).
- **Field Device Fault Status**: Fault status (0: no fault, 1: fault).

4. Installation and quick start

After having checked the requirements at Section 1.2, it is possible to proceed with the installation.

4.1 Installing the SWCX1 Configuration Software

In case a previous version of the SWCX1 Configuration Software was installed on the system, it is preferable to uninstall it before continuing.

Launch the installer Setup.exe and follow the instructions.

An icon (SWCX1) will be added to the program startup menu and to the Desktop at the end of the process.

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