

SWC5090

D5000 Series Configuration Software



Installation and user manual

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1 Introduction

The Configuration Software SWC5090 provides a PC user interface for D5000 series modules that allows the user to:

- ❑ Read and Write configuration parameters from and to the unit (via COM port);
- ❑ Restore data to and from local hard drive for backup;
- ❑ Monitor Input values (via COM port).
- ❑ Record monitoring sessions and save data to file.

1.1 Obtaining the SWC5090

The SWC5090 is absolutely free-of-charge and is distributed in each CD included in PPC5092 adapter package. Moreover, the most updated version can always be freely downloaded from www.gmintsr.com

1.2 Configurable models

G.M. International models that can be configured via SWC5090 software are:

- ❑ Smart Solenoid Drivers: D5293S, D5294S.
- ❑ Temperature Converters: D5072S, D5072D, D5273S

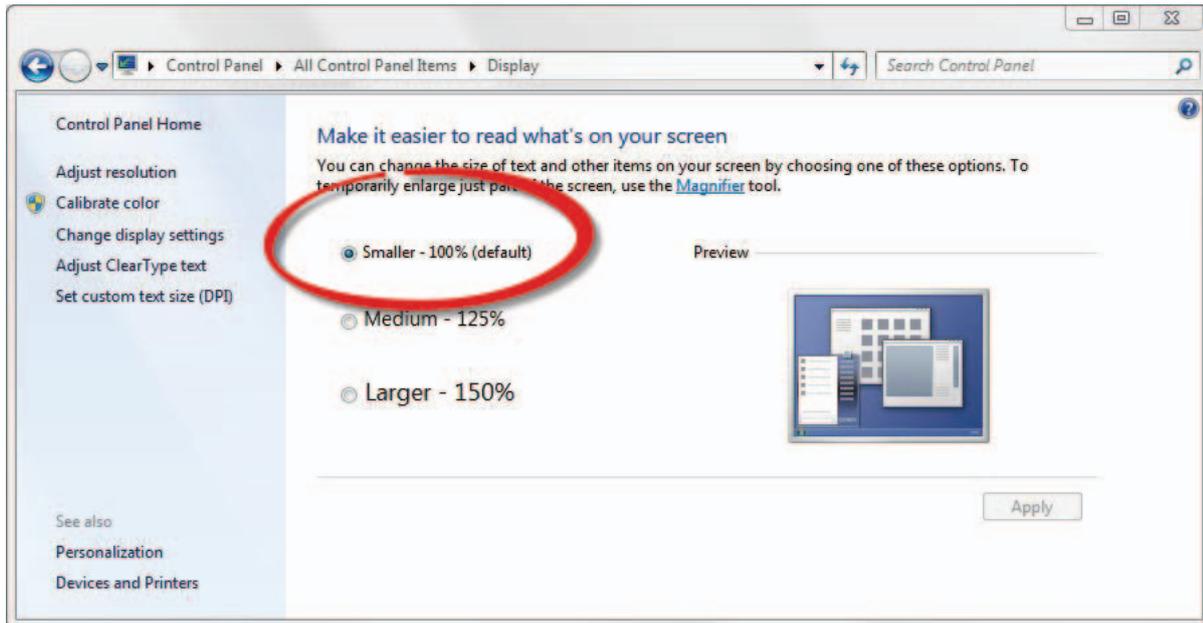


Fig. 1: SWC5090 Main Window.

1.3 Requirements

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

- ❑ Pentium class Processor 200MHz;
- ❑ 800x600 pixels screen resolution;
- ❑ 256 MB RAM;
- ❑ 1 USB port;
- ❑ "Microsoft Windows" operating system with latest updates installed;
- ❑ Windows 7 and 8 users should set text size at 100% (Small) in the Display settings of the Control Panel (see screenshot below)



Furthermore, the following items are required:

- ❑ PPC5092 (USB-to-MiniUSB Adapter) with correct drivers installed (See Section 8.1);
- ❑ MiniUSB-MiniUSB cable (provided with PPC5092).



Fig. 2: PPC5092 Adapter.



Fig. 3: Mini-USB cable included with PPC5092.

2 SWC5090 Main Window

At start-up, the SWC5090 Configuration Software loads a Main Window, which is the same for all D5000 Series modules. The Main Window is basically a frame with a menu at the top and a bottom bar.

In case the module is already connected to the PC correctly, the SWC5090 detects it and asks the user if he wishes to Read parameters from module directly. COM port is automatically set in the configuration file for future sessions.

Instead, if the module is not connected at startup, the user can:

- decide to work offline by selecting the desired model from the "Module" entry in the Menu
- read offline parameters saved to file by going to "File -> Open file" entry in the Menu

If the module is connected after startup of the SWC5090, the user has to manually read parameters by pressing the dedicated button on the top right of the screen.

2.1 Main Menu



Fig. 4: Menu.

The menu at the top of the Main Window (see Fig. 4) 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;
 - **Print Preview:** screen preview of the configuration report to be printed;
 - **Print:** configuration report print on paper;
 - **Exit:** exit from the configuration software.

- **“Settings”**

- **Serial**

- In the COM Port Setup window (see Fig. 5) the user can choose the COM Port of the PPC5092 in the drop-down menu at the top. The connection to the module can be tested by pressing the **“Test Port COM#”** button. Finally the COM Port can be updated by pressing the **“Update Com Port & Exit”** button or left unchanged by pressing the **“Exit without changes”** button.

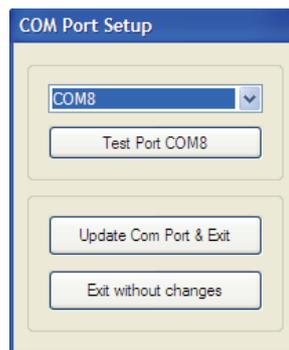


Fig. 5: COM Port Setup window

- **Modbus**

- In the Module Modbus Setup window (see Fig. 6) the user can introduce the Modbus address of the module (from 1 to 247), the Modbus Baud Rate (selectable among 4800, 9600, 19200, 38400, 57600 and 115200 bps) and the Modbus Format (no parity 1 stop bit, even parity 1 stop bit, odd parity 1 stop bit).

- The changes are saved by pressing the **“Ok”** button, while they are discarded by pressing **“Cancel”**.

- Note that the **“Write to Module”** button on the menu bar must be pressed to make the Modbus settings effective. Moreover, the module must be power cycled.

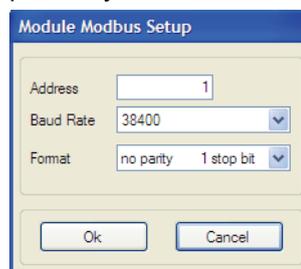


Fig. 6: Modbus Setup window.

- **Temperature Scale (only available with models D5072S, D5072D, D5273S)**

- Choose between °C and °F. The setting is stored into the configuration file for future uses.

- **“Module”**
 - **Select Model:** during off-line operations, select the module window among supported ones;
 - **Show Identification:** show the instrument and option code, and the software and hardware release. Identification is only available after that a read operation from module has been successfully completed.
 - **Load Factory Settings:** loads default parameters to configurator screen, for the selected module.
- **“?”**
 - **Show EULA:** The End User License Agreement is displayed and a copy can be saved;
 - **Help:** Opens this document in pdf format;
 - **About SWC5090:** Shows the release of the current SWC5090 Configuration Software.
 - **Updates:** In the Update Manager window (see Fig. 7) the user can automatically check the **“Running Version”** against the **“Last released Version”** from G.M. International database. The Configuration Software can be updated by pressing the **“Update”** button or left unchanged by pressing the **“Exit”** button.

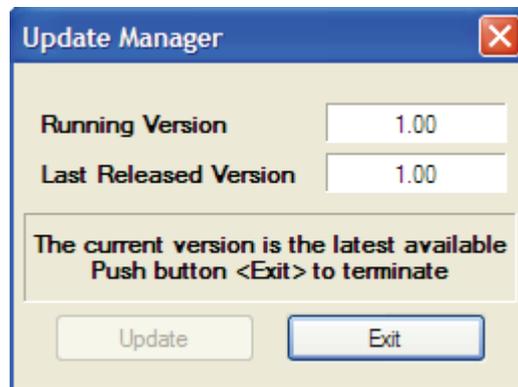


Fig. 7: Update Manager window.

On the right of the menu, two quick buttons are available: **“Read from Module”**, **“Write to Module”**. By pressing the first one, the configuration settings, the Modbus settings and the Tag currently stored in the Module are read from the module and displayed. Since this operation overwrites the settings on the screen, the user is asked for confirmation. The **“Write to Module”** button allows the storage to the Module of the configuration settings, the Modbus settings and the Tag, which are currently displayed on the Configuration window. By doing so, the previous settings saved on the Module are overwritten.

Note that all configuration functions are available only when offline (Monitor or Data Logger are inactive). In particular, the **“Write to Module”** button is activated only when configuration data was successfully read from the Module or loaded from a backup file.

2.2 Bottom Bar

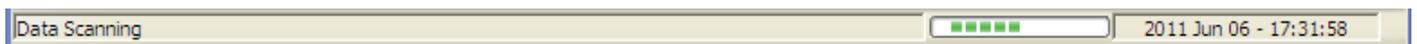


Fig. 8: Bottom Bar.

The Bottom Bar (see Fig. 8) includes a status bar, a progress bar that indicates that the operation is in progress, and the current date & time.

3 Application Windows

The center of the SWC5090 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 D5072S, D5072D, D5273S (up to v. 1.2.4)



D5072S, D5072D, D5273S are Universal Converters and share the same screens, except for the number of input, output and alarm channels.

The Application Window user interface is organized into the following areas:

- Configuration**
 - Input**
 - Output**
 - Alarm**
- Monitor**
- Data Logger**

3.1.1 Configuration

3.1.1.1 Input

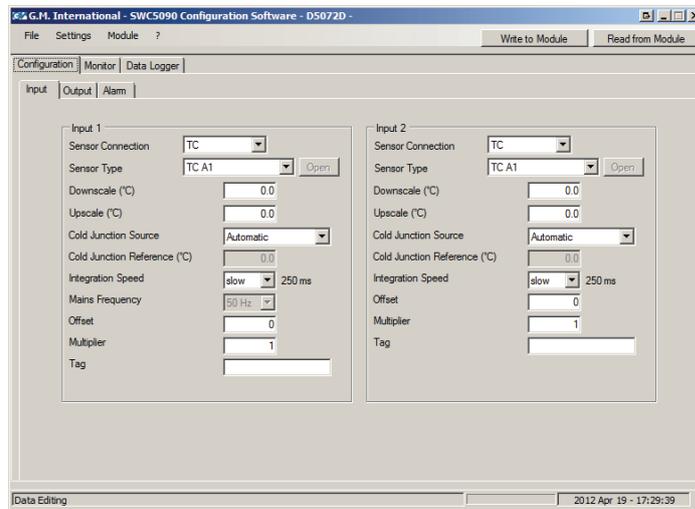


Fig. 9: D5072D Input configuration screen

INPUT

Sensor Connection:

- TC
- RTD
- Potentiometer
- Voltage
- Resistance

Sensor Type: input sensor type (see list in section “Input specifications”)
possibility of configuring a completely customized input curve (TC/RTD)

Wires: 2, 3, 4 wires selection for RTD/Resistance inputs

Downscale: input value of measuring range corresponding to defined low output value.

Upscale: input value of measuring range corresponding to defined high output value.

Cold Junction Source: reference junction compensation type (thermocouple only)

- Automatic via internal compensator (1 for each channel)
- Fixed programmable temperature compensation at fixed temperature
- Other Input remote compensation using RTD on remaining channel

Cold Junction Reference:

fixed temperature compensation value (Cold Junction type Fixed only), range from -60 to +100 °C.

Integration speed:

- Slow 250 ms (mV/TC, 2 wire RTD); 375 ms (Pot.), 500 ms (3,4 wire RTD)
- Fast 50 ms (mV/TC, 2 wire RTD); 75 ms (Pot.), 100 ms (3,4 wire RTD)

Mains Frequency:

- 50 Hz
- 60 Hz only available with fast integration speed

Offset: value to be added/subtracted to input (μV or $\text{m}\Omega$ depending on input sensor);

Multiplier: input multiplication value;

Tag: 16 alphanumeric characters

Note: Downscale and Upscale settings should follow Minimum Span requirements stated in the data sheet, in order to avoid negative impacts on Output resolution.

3.1.1.2 Output

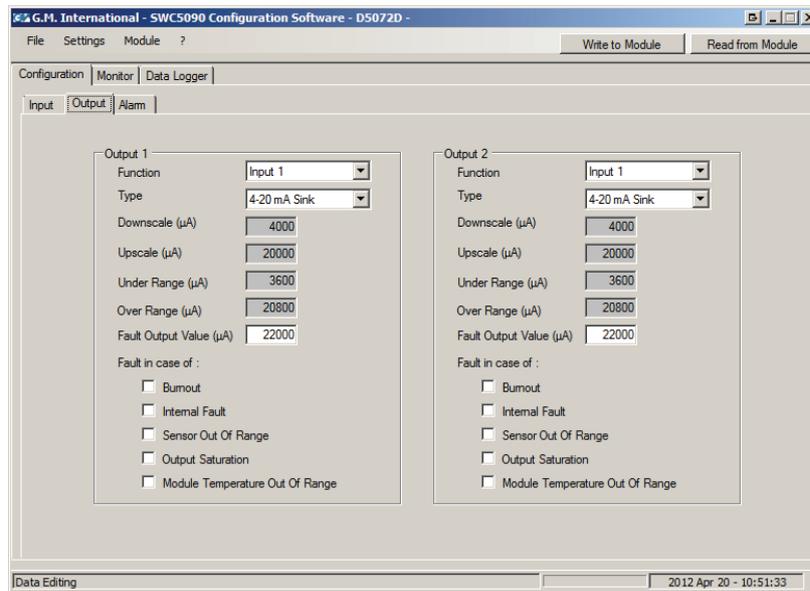


Fig. 10: D5072D Output configuration screen

OUTPUT

Function:

- Input 1 analog output represents input of first channel,
- Input 2 analog output represents input of second channel,
- Input 1 + 2 analog output represents the sum of the two input channels,
- Input 1 - 2 analog output represents the subtraction of the two input ch.,
- Min(Input 1, Input 2) analog output represents the lower of the two input ch.,
- Max(Input 1, Input 2) analog output represents the higher of the two input ch.

Type:

- 0-20 mA Sink
- 4-20 mA Sink
- Custom Sink All Output parameters are fully customizable.
- 0-20 mA Source
- 4-20 mA Source
- Custom Source All Output parameters are fully customizable.

Downscale: analog output downscale in normal working condition (range 0 to 24 mA)

Upscale: analog output downscale in normal working condition (range 0 to 24 mA)

Underrange: analog output downscale in underrange condition (range 0 to 24 mA)

Overrange: analog output downscale in overrange condition (range 0 to 24 mA)

Fault Output Value: analog output value in case of fault condition (range 0 to 24 mA)

Fault in case of: analog output is forced to "Fault Output Value" in case of:

- Burnout input sensor interruption,
- Internal fault module internal fault,
- Sensor out of range input sensor out of configured input range,
- Output Saturation output is below Underrange or above Overrange,
- Module Temp. Out of range internal module temperature under or over specified module operating temperature limits.

3.1.1.3 Alarm

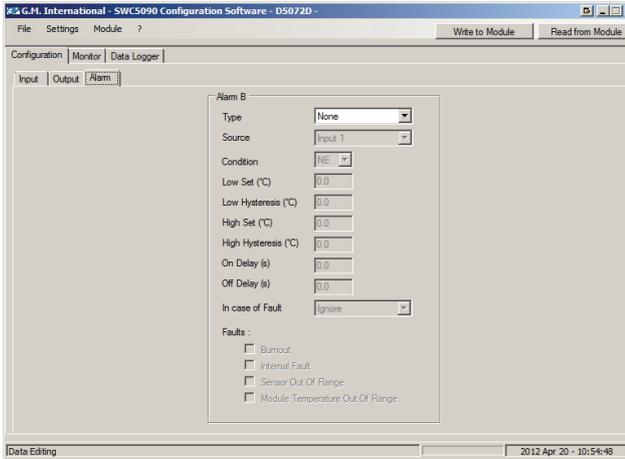


Fig. 11: D5072D Alarm configuration screen

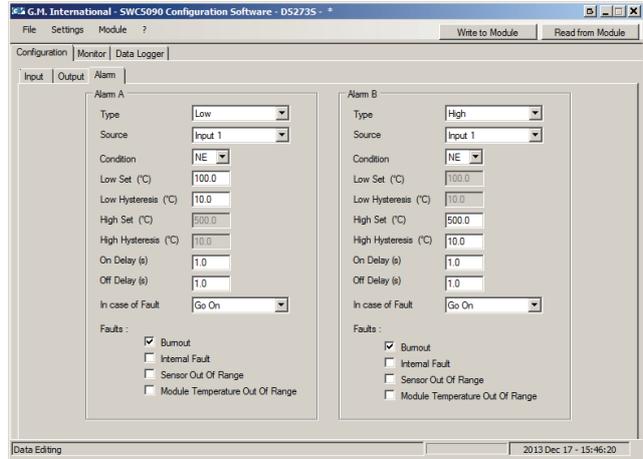


Fig. 12: D5273S Alarm configuration screen

ALARM

Type:

- None alarm is disabled,
- Low alarm is triggered when source descends below “Low Set”,
- LowLock alarm is inhibited until source ascends over “Low Set”, and then, it behaves as a standard “Low” configuration,
- High alarm is triggered when source ascends over “High Set”,
- HighLock alarm is inhibited until source descends below “High Set”, and then, it behaves as a standard “High” configuration,
- Window alarm is triggered below “Low Set” and above “High Set”,
- Fault Repeater alarm output reflects selected (one or more) Fault status.

Source: reference value for alarm triggering

- Input 1 input of first channel,
- Input 2 input of second channel,
- Input 1 + 2 sum of the two input channels,
- Input 1 - 2 subtraction of the two input channels,
- Min(Input 1, Input 2) lower of the two input channels,
- Max(Input 1, Input 2) higher of the two input channels.

Condition:

- NE alarm output is normally energized when deactivated,
- ND alarm output is normally de-energized when deactivated.

Low Set: source value at which the alarm is triggered (in Low, LowLock, Window)

Low Hysteresys: triggered Low alarm deactivates when source value reaches
Low Set + Low Hysteresys (0-500 °C, 0-50 mV, 0-50 %)

High Set: source value at which the alarm is triggered (in High, HighLock, Window)

High Hysteresys: triggered High alarm deactivates when source value reaches
High Set - High Hysteresys (0-500 °C, 0-50 mV, 0-50 %)

On Delay: time for which the source variable has to be in alarm condition before the alarm output is triggered; configurable from 0 to 1000 seconds in steps of 100 ms

Off Delay: time for which the source variable has to be in normal condition before the alarm output is deactivated; configurable from 0 to 1000 seconds in steps of 100 ms

In case of fault:

- Ignore alarm is not affected
- Lock status alarm remains in the same status as it was before Fault occurred
- Go On alarm is triggered,
- Go Off alarm is deactivated

Faults: if “Type” is set to “Fault repeater” select which faults will be repeated by alarm output; if “In case of fault” is different from “Ignore”, select which faults should influence alarm output behaviour.

3.1.2 Monitor

The SWC5090 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.

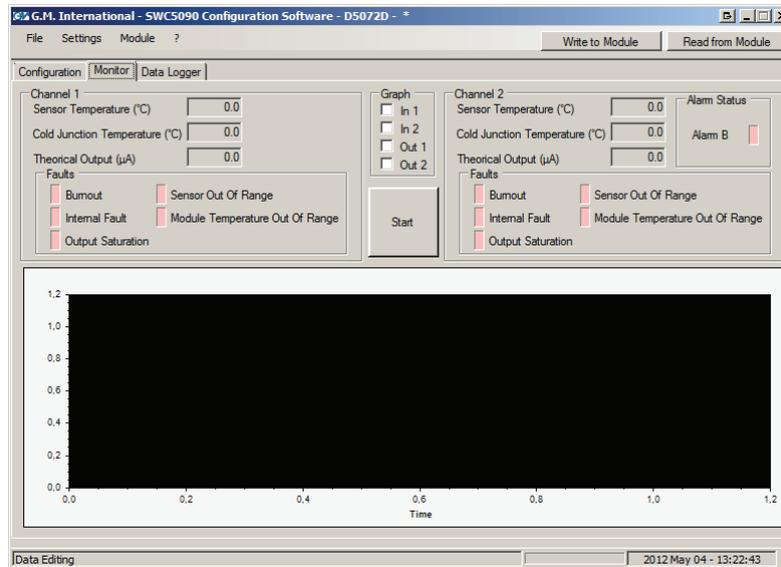


Fig. 13: D5072D Monitor screen

The display shows Input and Theoretical Output values, fault and alarm status and a graph of chosen variable.

3.1.2.1 Input

Input variable is shown as it is detected by the module, after having applied configured calculations (Offset, Multiplier) and conversions.

Cold Junction Temperature shows the value of the internal Cold Junction; this value will influence the Output measure when Cold Junction configuration is set to "Automatic".

3.1.2.2 Output

This value represents the theoretical output. During certain conditions, this value may differ from the measured value at output terminal blocks.

3.1.2.3 Alarm status

Alarm status is represented by a LED, which is RED when activated. The LED status reflects the status of the Alarm exactly as configured.

3.1.2.4 Faults

Each Fault status is represented by a LED, which is RED when activated.

Note that the LED status does not take into account the current module configuration, therefore it only indicates the existence of the fault condition, independently from any configured behavior in case of fault.

3.1.2.5 Graph

The graph can show only one variable that must be chosen from the checkboxes above.

3.1.3 Data Logger

The SWC5090 can monitor and record data from the module at constant configurable time intervals. By changing the parameters, the user can decide the duration of the recording period and the frequency of readings. After pressing “Start” button, the SWC5090 will prompt for a filename where the values will be stored in .CSV format. Note that while the module is being recorded, Configuration screens are disabled, while Monitoring remains active.

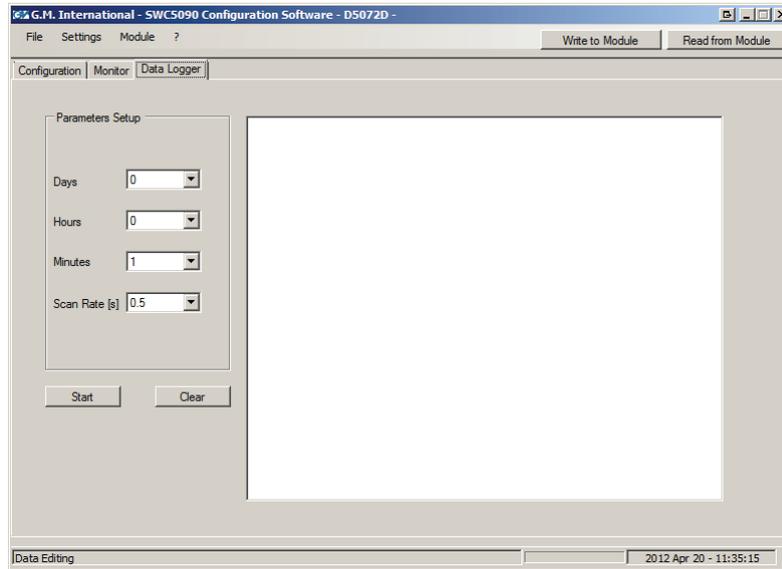
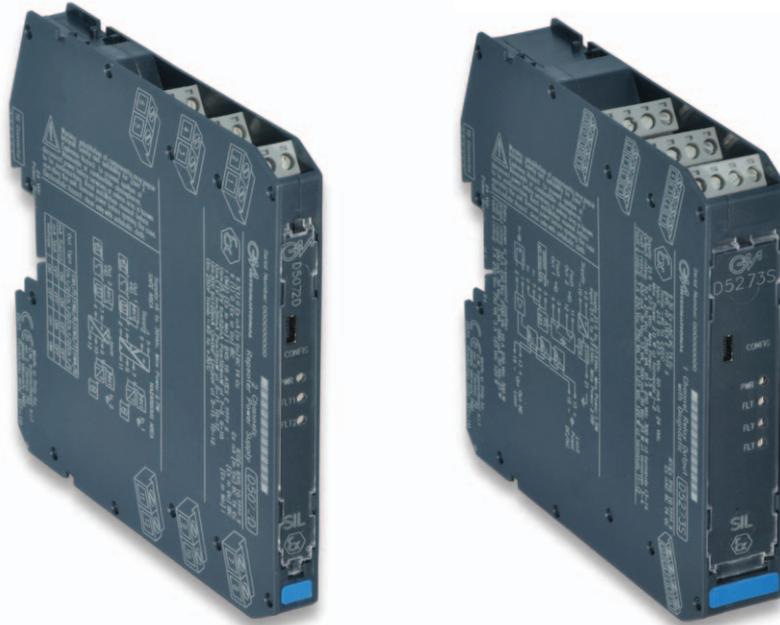


Fig. 14: Data Logger screen

3.2 D5072S, D5072D, D5273S (from v. 1.2.5)



D5072S, D5072D, D5273S are Universal Converters and share the same screens, except for the number of input, output and alarm channels.

The Application Window user interface is organized into the following areas:

- Configuration**
 - Input**
 - Output**
 - Alarm**
- Monitor**
- Data Logger**

3.2.1 Configuration

3.2.1.1 Input

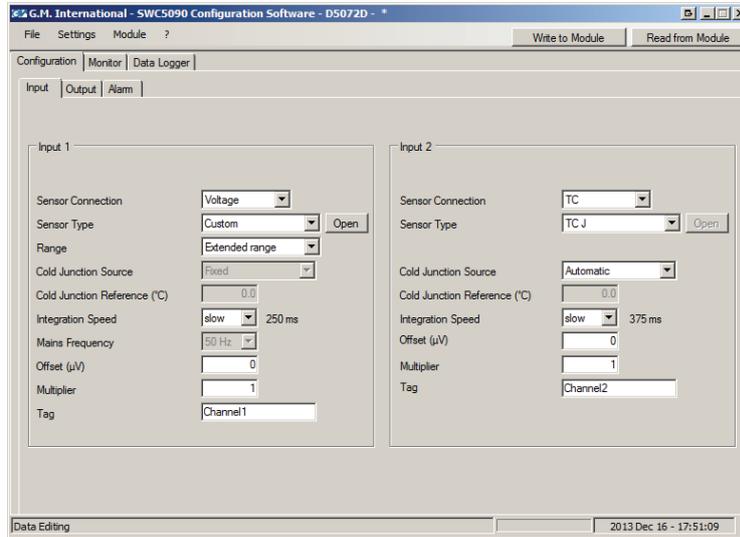


Fig. 15: D5072D Input configuration screen

INPUT

Sensor Connection:

- TC
- RTD
- Potentiometer
- Voltage
- Resistance

Sensor Type:

if Sensor is TC or RTD, choose type from list in section “Input specifications”, plus possibility of configuring a completely customized input curve

If Sensor is Potentiometer, Voltage, or Resistance, choose between

- Linear relation Input is linearly converted into Output;
- Custom Allows the total characterization of Input/Output curve. Click “Open” button to proceed.

Sensor Range:

- Standard range (from -50 mV to +80 mV)
- Extended range (from -550 mV to +550 mV)

Wires: 2, 3, 4 wires selection for RTD/Resistance inputs

Cold Junction Source: reference junction compensation type (thermocouple only)

- Automatic via internal compensator (1 for each channel)
- Fixed programmable temperature compensation at fixed temperature
- Other Input remote compensation using RTD on remaining channel

Cold Junction Reference:

fixed temperature compensation value (Cold Junction type Fixed only), range from –60 to +100 °C.

Integration speed:

- Slow 250 ms (mV/TC,2 wire RTD); 375 ms (Pot.), 500 ms (3,4 wire RTD)
- Fast 50 ms (mV/TC,2 wire RTD); 75 ms (Pot.), 100 ms (3,4 wire RTD)

Mains Frequency:

- 50 Hz
- 60 Hz only available with fast integration speed

Offset: value to be added/subtracted to input (μV or mΩ depending on input sensor);

Multiplier: input multiplication value;

Tag: 16 alphanumeric characters

3.2.1.2 Output

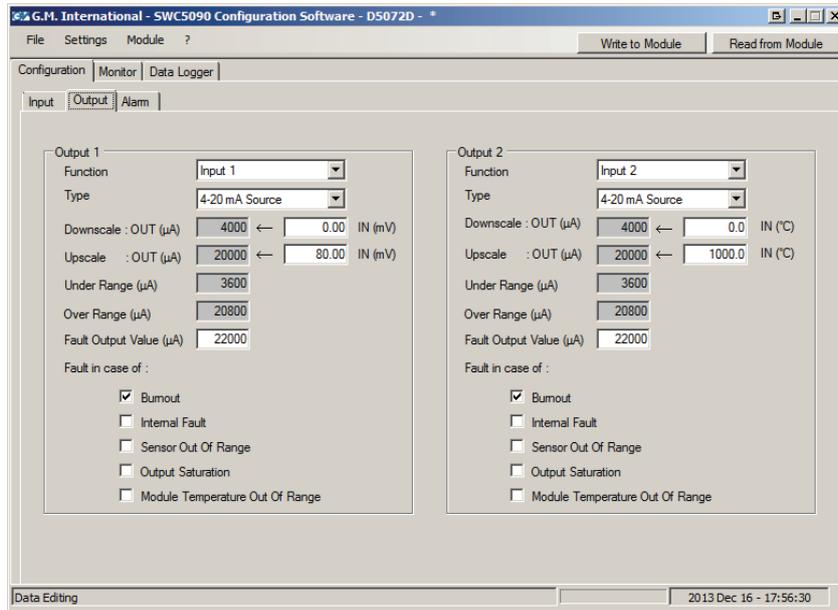


Fig. 16: D5072D Output configuration screen

OUTPUT

Function:

- Input 1 analog output represents input of first channel,
- Input 2 analog output represents input of second channel,
- Input 1 + 2 analog output represents the sum of the two input channels,
- Input 1 - 2 analog output represents the subtraction of the two input ch.,
- Min(Input 1, Input 2) analog output represents the lower of the two input ch.,
- Max(Input 1, Input 2) analog output represents the higher of the two input ch.

Type:

- 0-20 mA Sink
- 4-20 mA Sink
- Custom Sink All Output parameters are fully customizable.
- 0-20 mA Source
- 4-20 mA Source
- Custom Source All Output parameters are fully customizable.

Downscale: analog output downscale in normal working condition (range 0 to 24 mA)

Upscale: analog output downscale in normal working condition (range 0 to 24 mA)

Underrange: analog output downscale in underrange condition (range 0 to 24 mA)

Overrange: analog output downscale in overrange condition (range 0 to 24 mA)

Fault Output Value: analog output value in case of fault condition (range 0 to 24 mA)

Fault in case of: analog output is forced to "Fault Output Value" in case of:

- Burnout input sensor interruption,
- Internal fault module internal fault,
- Sensor out of range input sensor out of configured input range,
- Output Saturation output is below Underrange or above Overrange,
- Module Temp. Out of range internal module temperature under or over specified module operating temperature limits.

Note: Downscale and Upscale settings should follow Minimum Span requirements stated in the data sheet, in order to avoid negative impacts on Output resolution.

3.2.1.3 Alarm

See section 3.1.1.3 at page 12.

3.2.2 Monitor

See section 3.1.2 at page 13.

3.2.3 Data Logger

See section 3.1.3 at page 14.

3.3 D5072S-088, D5072D-088



D5072S-088, D5072D-088 Universal Converters and share the same screens, except for the number of input and outputs. Input sensor is fixed to “Current Sensor”.

The Application Window user interface is organized into the following areas:

- Configuration**
 - Input**
 - Output**
 - Alarm**
- Monitor**
- Data Logger**

3.3.1 Configuration

3.3.1.1 Input

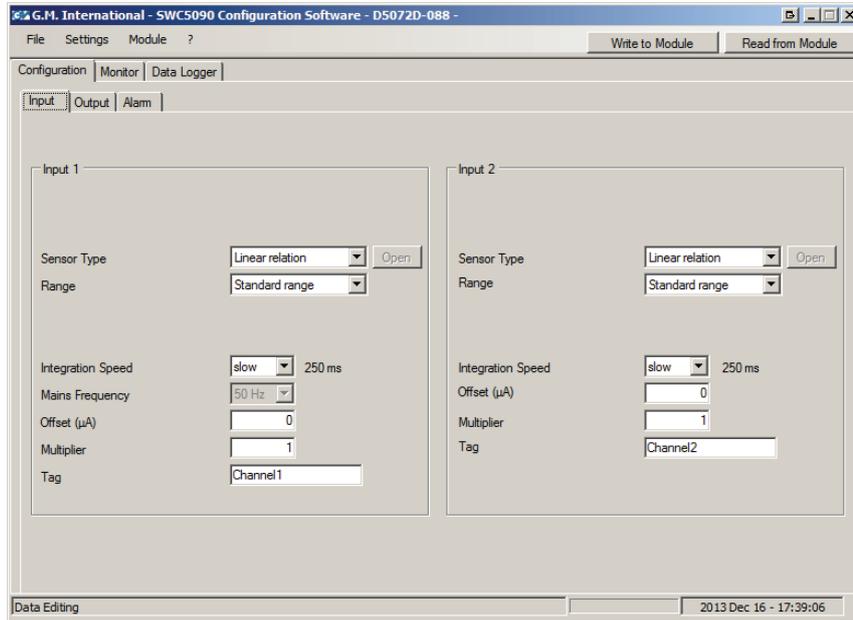


Fig. 17: D5072D-088 Input configuration screen

INPUT

Sensor Connection: fixed to “Current Sensor” (see data sheet)

Sensor Type:

- Linear relation Input is linearly converted into Output;
- Custom Allows the total characterization of Input/Output curve. Click “Open” button to proceed.

Sensor Range:

- Standard range (from -5 mA to +5 mA)
- Extended range (from -25 mA to +25 mA)

Integration speed:

- Slow 250 ms
- Fast 50 ms

Mains Frequency:

- 50 Hz
- 60 Hz only available with fast integration speed

Offset: value to be added/subtracted to input (µA);

Multiplier: input multiplication value;

Tag: 16 alphanumeric characters

3.3.1.2 Output

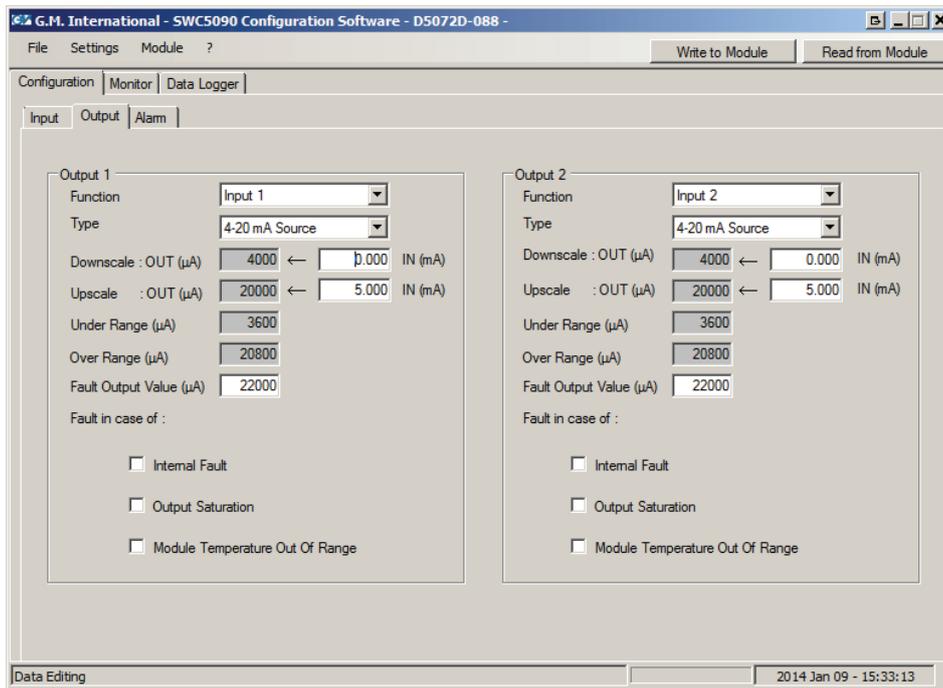


Fig. 18: D5072D-088 Output configuration screen

OUTPUT

Function:

- Input 1 analog output represents input of first channel,
- Input 2 analog output represents input of second channel,
- Input 1 + 2 analog output represents the sum of the two input channels,
- Input 1 - 2 analog output represents the subtraction of the two input ch.,
- Min(Input 1, Input 2) analog output represents the lower of the two input ch.,
- Max(Input 1, Input 2) analog output represents the higher of the two input ch.

Type:

- 0-20 mA Sink
- 4-20 mA Sink
- Custom Sink All Output parameters are fully customizable.
- 0-20 mA Source
- 4-20 mA Source
- Custom Source All Output parameters are fully customizable.

Downscale: analog output downscale in normal working condition (range 0 to 24 mA)

Upscale: analog output downscale in normal working condition (range 0 to 24 mA)

Underrange: analog output downscale in underrange condition (range 0 to 24 mA)

Overrange: analog output downscale in overrange condition (range 0 to 24 mA)

Fault Output Value: analog output value in case of fault condition (range 0 to 24 mA)

Fault in case of: analog output is forced to "Fault Output Value" in case of:

- Internal fault module internal fault,
- Output Saturation output is below Underrange or above Overrange,
- Module Temp. Out of range internal module temperature under or over specified module operating temperature limits.

Note: Downscale and Upscale settings should follow Minimum Span requirements stated in the data sheet, in order to avoid negative impacts on Output resolution.

3.3.1.3 Alarm

See section 3.1.1.3 at page 12.

3.3.2 Monitor

The SWC5090 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.

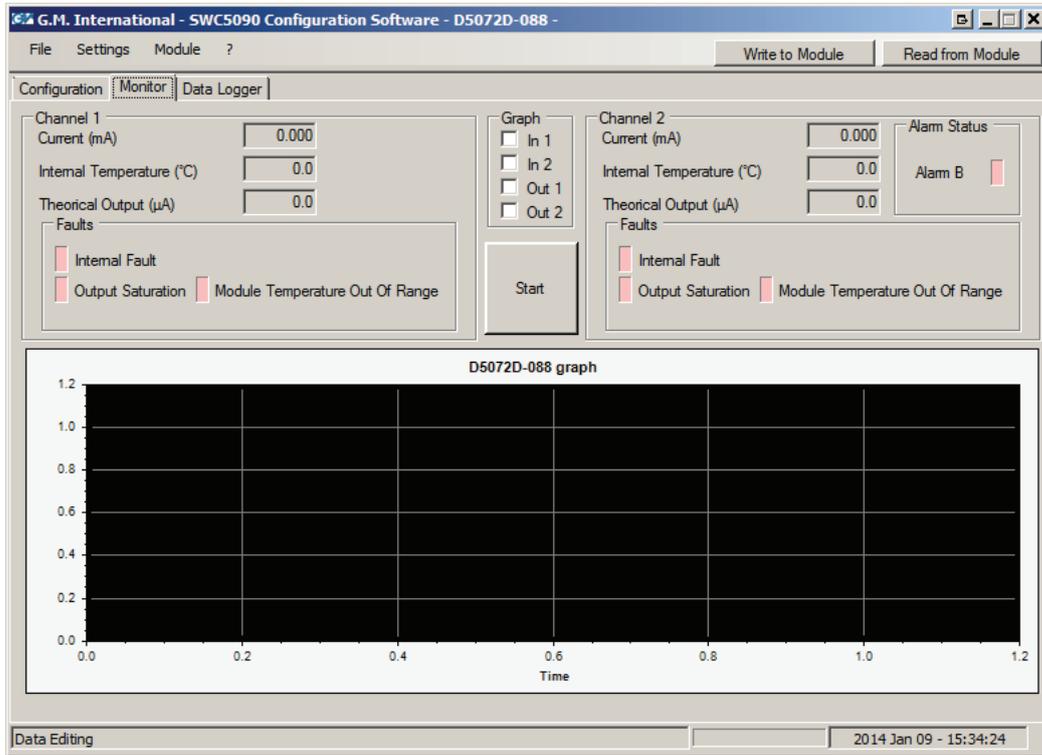


Fig. 19: D5072D-088 Monitor screen

The display shows Input and Theoretical Output values, fault and alarm status and a graph of chosen variable.

3.3.2.1 Input

Input variable is shown as it is detected by the module, after having applied configured calculations (Offset, Multiplier) and conversions.

3.3.2.2 Output

This value represents the theoretical output. During certain conditions, this value may differ from the measured value at output terminal blocks.

3.3.2.3 Alarm status

Alarm status is represented by a LED, which is RED when activated. The LED status reflects the status of the Alarm exactly as configured.

3.3.2.4 Faults

Each Fault status is represented by a LED, which is RED when activated.

Note that the LED status does not take into account the current module configuration, therefore it only indicates the existence of the fault condition, independently from any configured behavior in case of fault.

3.3.2.5 Graph

The graph can show only one variable that must be chosen from the checkboxes above.

3.3.3 Data Logger

See section 3.1.3 at page 14.

3.4 D5072S-089, D5072D-089



D5072S-089, D5072D-089, are Universal Converters and share the same screens, except for the number of input and output channels. Voltage Output.

The Application Window user interface is organized into the following areas:

- Configuration**
 - Input**
 - Output**
- Monitor**
- Data Logger**

3.4.1 Configuration

3.4.1.1 Input

See section 3.2.1.1 at page 16

3.4.1.2 Output

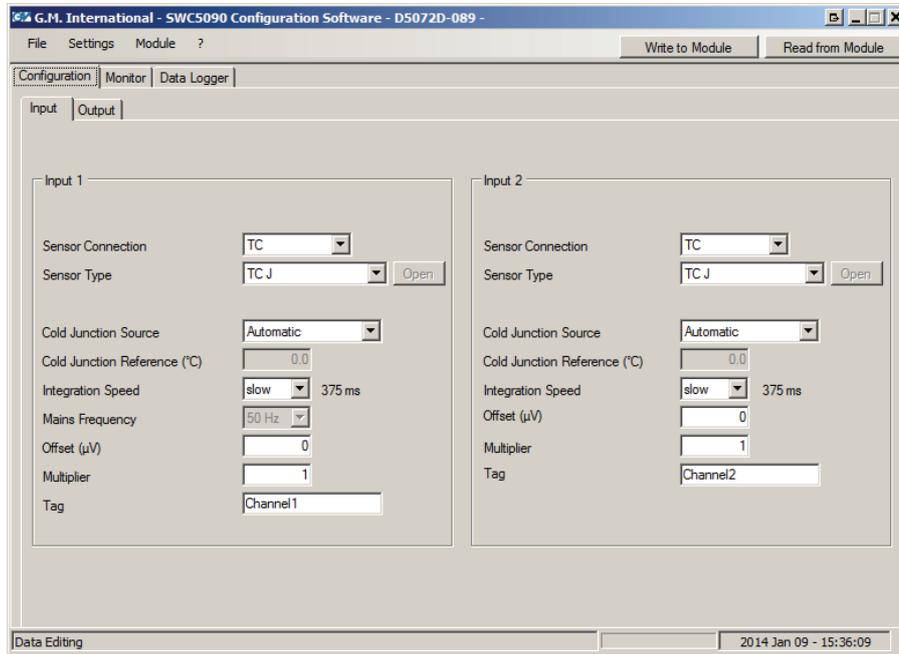


Fig. 20: D5072D-089 Output configuration screen

OUTPUT

Function:

- Input 1 analog output represents input of first channel,
- Input 2 analog output represents input of second channel,
- Input 1 + 2 analog output represents the sum of the two input channels,
- Input 1 - 2 analog output represents the subtraction of the two input ch.,
- Min(Input 1, Input 2) analog output represents the lower of the two input ch.,
- Max(Input 1, Input 2) analog output represents the higher of the two input ch.

Type:

- 1-5 V Source
- 0-5 V Source
- Custom Source All Output parameters are fully customizable.

Downscale: analog output downscale in normal working condition (range 0 to 6000 mV)

Upscale: analog output downscale in normal working condition (range 0 to 6000 mV)

Underrange: analog output downscale in underrange condition (range 0 to 6000 mV)

Overrange: analog output downscale in overrange condition (range 0 to 6000 mV)

Fault Output Value: analog output value in case of fault condition (range 0 to 6000 mV)

Fault in case of: analog output is forced to "Fault Output Value" in case of:

- Burnout input sensor interruption,
- Internal fault module internal fault,
- Sensor out of range input sensor out of configured input range,
- Output Saturation output is below Underrange or above Overrange,
- Module Temp. Out of range internal module temperature under or over specified module operating temperature limits.

Note: Downscale and Upscale settings should follow Minimum Span requirements stated in the data sheet, in order to avoid negative impacts on Output resolution.

3.4.2 Monitor

The SWC5090 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.

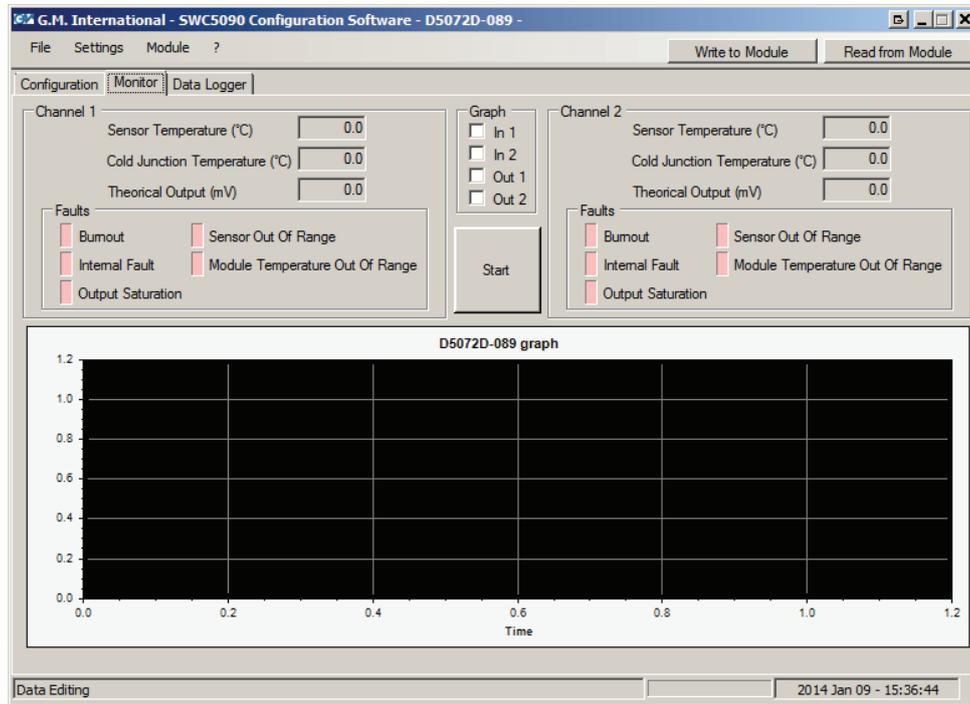


Fig. 21: D5072D-089 Monitor screen

The display shows Input and Theoretical Output values, fault and alarm status and a graph of chosen variable.

3.4.2.1 Input

Input variable is shown as it is detected by the module, after having applied configured calculations (Offset, Multiplier) and conversions.

3.4.2.2 Output

This value represents the theoretical output. During certain conditions, this value may differ from the measured value at output terminal blocks.

3.4.2.3 Faults

Each Fault status is represented by a LED, which is RED when activated.

Note that the LED status does not take into account the current module configuration, therefore it only indicates the existence of the fault condition, independently from any configured behavior in case of fault.

3.4.2.4 Graph

The graph can show only one variable that must be chosen from the checkboxes above.

3.4.3 Data Logger

See section 3.1.3 at page 14.

3.5 D5231E



Fig. 22: D5231E

D5231E is an intrinsically safe eight channel Switch/Proximity detector repeater interface. Modbus RTU RS-485 output is available on Bus connector.

The Application Window user interface is organized into the following areas:

- Configuration**
- Monitor**
- Data Logger**

3.5.1 Configuration

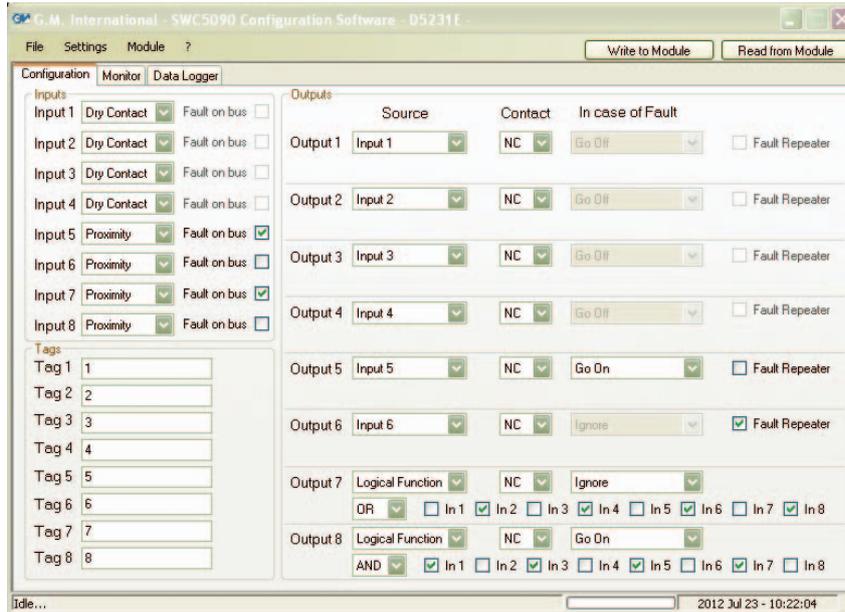


Fig. 23: D5231E Configuration screen

Configuration parameters can be read and written from the module or from saved file. It is also possible to reset the module configuration to factory default settings. A report sheet containing complete configuration can be printed.

INPUTS 1 to 8:

Sensor Type:

- Proximity
- Voltage free contact

Note: To enable line diagnostic on Voltage free contacts, follow instructions in Section "Operation" of Instruction Manual ISM0172 and configure sensor as "Proximity".

TAGS 1 to 8:

16 alphanumerical characters

OUTPUTS 1 to 8:

Source:

- Input 1 Output represents Input 1,
- Input 2 Output represents Input 2,
- Input 3 Output represents Input 3,
- Input 4 Output represents Input 4,
- Input 5 Output represents Input 5,
- Input 6 Output represents Input 6,
- Input 7 Output represents Input 7,
- Input 8 Output represents Input 8,
- Logical function Output represents AND/OR function of selected inputs.

Contact: normal condition of output contact

- NC Normally Closed,
- NO Normally Open.

In case of fault: Output behaviour when Input fault is detected

- Ignore Ignore,
- Go On Switch to ON status,
- Go Off Switch to OFF status.

Fault repeater: Output represents Input Fault status

Logical Function: visible only when selected in "Output source"

Allows the logical binding of 2 or more (up to 8) Inputs.

- AND Output represents AND logical function of selected Inputs,
- OR Output represents OR logical function of selected Inputs.

3.5.2 Monitor

The SWC5090 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.

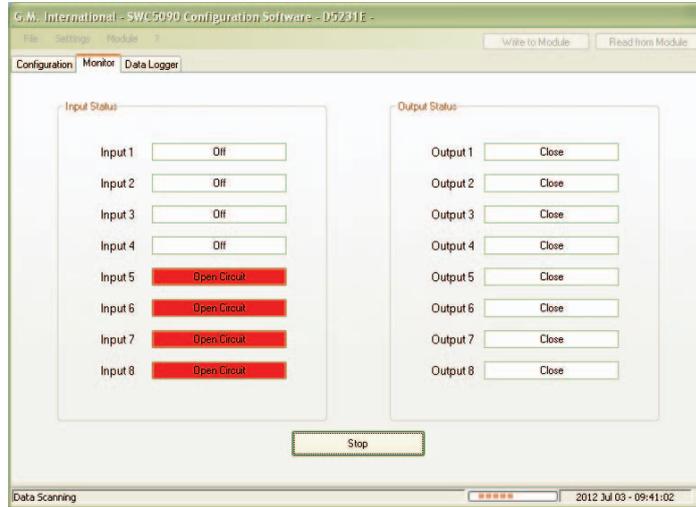


Fig. 24: D5072D Monitor screen

INPUT STATUS:

The status of each input is shown

- Open circuit Open circuit fault (only for Proximity Inputs),
- Off Off,
- On On,
- Short circuit Short circuit fault (only for Proximity Inputs).

OUTPUT STATUS:

The status of each output contact is shown

- Open
- Closed

3.5.3 Data Logger

The SWC5090 can monitor and record data from the module at constant configurable time intervals. By changing the parameters, the user can decide the duration of the recording period and the frequency of readings. After pressing “Start” button, the SWC5090 will prompt for a filename where the values will be stored in .CSV format. Note that while the module is being recorded, Configuration screens are disabled, while Monitoring remains active.

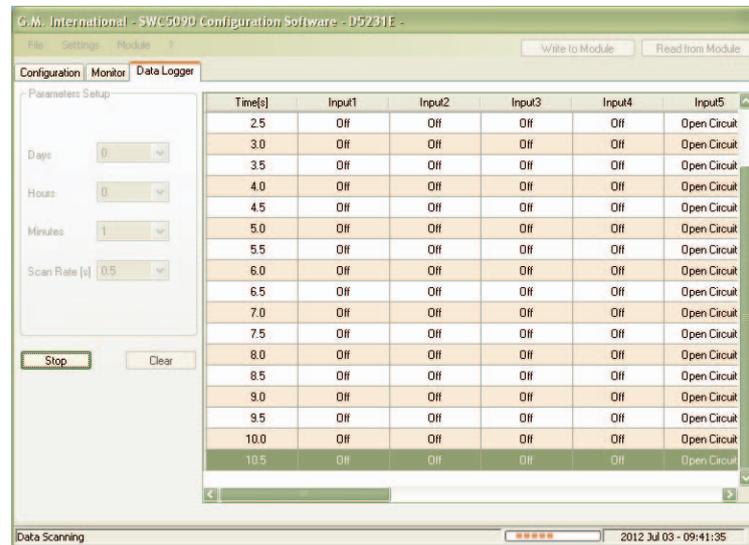


Fig. 25: Data Logger screen

PARAMETERS SETUP:

- Days:** Number of days to acquire
- Hours:** Number of hours to acquire
- Minutes:** Number of minutes to acquire
- Scan rate:** Frequency interval for acquisitions

3.6 D5293S and D5294S



The D5293S-D5294S Application Window user interface is organized into three Tabs:

- ❑ **Configuration**
 - ❑ User Manual Settings
 - ❑ Fault Conditions Monitoring
 - ❑ Tag
 - ❑ Acquire Functions
 - ❑ Continuous Scan
- ❑ **Monitor**
 - ❑ Measured Values
 - ❑ Graph
- ❑ **Data Logger**

3.6.1 Configuration

3.6.1.1 Continuous Scan

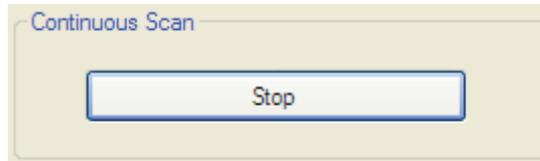


Fig. 26: Continuous Scan box.

By pressing the “**Start**” button in the **Continuous Scan** box (see Fig. 26), the module starts acquiring the data field (in the **Measured Values**) periodically. To interrupt data acquisition press the same button – this time the label will be “**Stop**” – shall be pressed.

3.6.1.2 Tag



Fig. 27: Tag box.

The **Tag** (see Fig. 27) provides a label that can be associated to the specific loop.

3.6.1.3 User Manual Settings

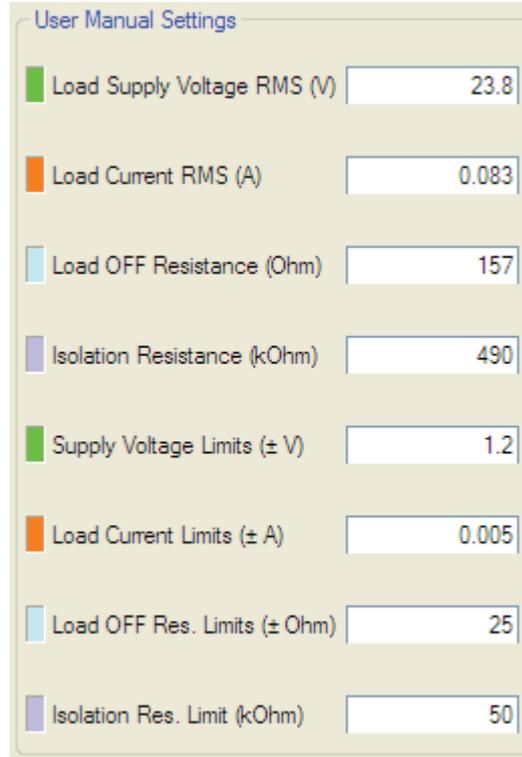


Fig. 28: User Manual Settings box.

User Manual Settings (see Fig. 28) can partially be acquired through the **Acquire Functions** and/or changed manually before being written to the D5293S/D5294S module through the **“Write to Module”** button on the Menu Bar.

User Manual Settings include:

- ❑ **Load Supply Voltage RMS (V)**
indicates the RMS voltage that is actually applied (in ON State, load energized) or that will be applied (in OFF State, load de-energized) to the load.
- ❑ **Load Current RMS (A)**
represents the RMS current that is flowing through the load (hence it will be zero in OFF state).
- ❑ **Load OFF Resistance (Ω)**
is the load resistance measured in OFF State. In ON State, this value will remain at the saturation value (5 kΩ)
- ❑ **Isolation Resistance (kΩ)**
shows the leakage resistance to earth. Also the Isolation Resistance is measured only in OFF State; during ON State, it goes to the saturation value of 3 MΩ
- ❑ **Coil Integrity**
monitors the status of the relay coil in ON State: “FAIL” indicates that a relay coil is in short-circuit
- ❑ **Driver Status**
indicates whether the load has been energized (“ON”) or not (“OFF”)

User Manual Settings specify nominal values and limits that will activate the fault indication (red LED and two fault relay contacts). See Section 3.6.1.4 for more details.

Remember that only after pressing the **“Write to Module”** button on the Menu Bar **User Manual Settings** and **Fault Conditions Monitoring** become effective.

See Section 3.6.1.4 for an explanation of the color indicators on the left.

3.6.1.4 Fault Conditions Monitoring

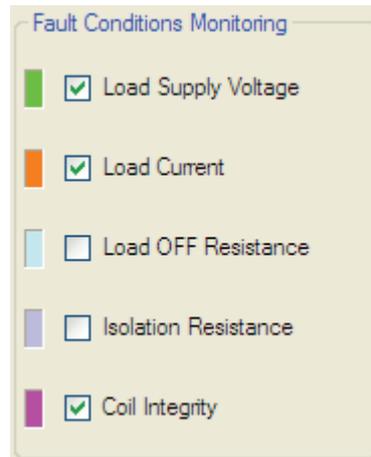


Fig. 29: Fault Conditions Monitoring box.

Fault Conditions Monitoring (see Fig. 29) indicate which subset of the **User Manual Settings** shall activate the fault. Therefore:

- ❑ *If Load Supply Voltage is enabled,*
a measured *Load Supply Voltage RMS* outside the specified limits will activate the fault.
- ❑ *If Load Current is enabled,*
a measured *Load Current RMS* outside the specified limits will activate the fault.
- ❑ *If Load OFF Resistance is enabled,*
a measured *Load OFF Resistance* outside the specified limits shall activate the fault.
- ❑ *If Isolation Resistance is enabled,*
only a measured *Isolation Resistance* below the specified limit shall activate the fault.
- ❑ *If Coil Integrity is enabled,*
a coil short circuit in ON state shall activate the fault.

Note that, by activating the monitoring of a fault condition, the related color indicator on the left side becomes brighter together with the corresponding measured value and user manual settings. This color policy allows a fast identification of the quantities that contribute to the fault activation.

Fault Conditions Monitoring are combined with the **Driver Status**. While the *Load Supply Voltage RMS* can always be effective, the *Load Current RMS* and *Coil Integrity* can be active only during the ON State, whereas the *Load OFF Resistance* and the *Isolation Resistance* only during the OFF State.

Note also that only after pressing the “**Write to Module**” button on the Menu Bar the **User Manual Settings** and the **Fault Conditions Monitoring** will be saved onto the module, hence becoming effective.

3.6.1.5 Fault Activation

The fault is activated if at least one of the following conditions are met:

- ❑ *Load Supply Voltage* Monitoring is enabled AND
 $((\text{Load Supply Voltage RMS} < \text{Load Supply Voltage RMS Nominal} - \text{Supply Voltage Limits}) \text{ OR } (\text{Load Supply Voltage RMS} > \text{Load Supply Voltage RMS Nominal} + \text{Supply Voltage Limits}))$
- ❑ *Load Current* Monitoring is enabled AND the load is Activated AND
 $((\text{Load Current RMS} < \text{Load Current RMS Nominal} - \text{Load Current Limits}) \text{ OR } (\text{Load Current RMS} > \text{Load Current RMS Nominal} + \text{Load Current Limits}))$
- ❑ *Load OFF Resistance* Monitoring is enabled AND the load is De-activated AND
 $((\text{Load OFF Resistance} < \text{Load OFF Resistance Nominal} - \text{Load OFF Resistance Limits}) \text{ OR } (\text{Load OFF Resistance} > \text{Load OFF Resistance Nominal} + \text{Load OFF Resistance Limits}))$
- ❑ *Isolation Resistance* Monitoring is enabled AND the load is De-activated AND
 $(\text{Isolation Resistance} < \text{Isolation Resistance Nominal} - \text{Isolation Resistance Limit})$
- ❑ *Coil Integrity* Monitoring is enabled AND the load is Activated AND
Coil Integrity is FAIL.

Active Monitoring	Driver Status					
	OFF State			ON State		
Load Supply Voltage	$V_{meas} < V_{nom} - V_{lim}$	$V_{nom} - V_{lim} \leq V_{meas}$ or $V_{meas} \leq V_{nom} + V_{lim}$	$V_{nom} + V_{lim} < V_{meas}$	$V_{meas} < V_{nom} - V_{lim}$	$V_{nom} - V_{lim} \leq V_{meas}$ or $V_{meas} \leq V_{nom} + V_{lim}$	$V_{nom} + V_{lim} < V_{meas}$
Load Current	<u>Not applicable</u>			$I_{meas} < I_{nom} - I_{lim}$	$I_{nom} - I_{lim} \leq I_{meas}$ or $I_{meas} \leq I_{nom} + I_{lim}$	$I_{nom} + I_{lim} < I_{meas}$
Load OFF Resistance	$R_{meas} < R_{nom} - R_{lim}$	$R_{nom} - R_{lim} \leq R_{meas}$ or $R_{meas} \leq R_{nom} + R_{lim}$	$R_{nom} + R_{lim} < R_{meas}$	<u>Not applicable</u>		
Isolation Resistance	$R_{meas} < R_{nom} - R_{lim}$	$R_{nom} - R_{lim} \leq R_{meas}$		<u>Not applicable</u>		
Coil Integrity	<u>Not applicable</u>			FAIL	OK	

Table 1: Combination of Monitoring functions activation with Driver Status.

Table 1 shows how the activation of the various Monitoring functions combines with the Driver Status: a red cell indicates that the fault can be activated, while a green cell indicates that the fault cannot be activated.

Note again that only after pressing the “**Write to Module**” button on the Menu Bar, the **User Manual Settings** and **Fault Conditions Monitoring** will be exported to the module, hence becoming effective.

When the fault is activated, the red LED is lighted and the two fault relays open. On the Application Window the **Measured Values** that caused the fault turn red.

3.6.1.6 Acquire Functions

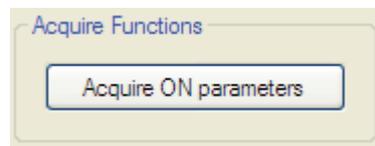


Fig. 30: Acquire Functions box.

The **Acquire Functions** (see Fig. 30) allows the user to acquire the **Measured Values** to the **User Manual Settings**. These functions ease the user’s task, while avoiding that the technical details (supply voltage, load current, load resistance, etc.) of the application are necessary for the module configuration. If the load is de-energized (OFF State), the “**Acquire OFF parameters**” button will copy the *Load Supply Voltage RMS* and the *Load OFF Resistance* to the corresponding **User Manual Settings**. If the load is energized (ON State), the “**Acquire ON parameters**” button will copy the *Load Supply Voltage RMS* and the *Load Current RMS* to the corresponding **User Manual Settings**.

Note that the data acquisition button can be pressed only when the continuous scan is active, hence avoiding to acquire outdated field values.

3.6.2 Monitor

3.6.2.1 Measured Values

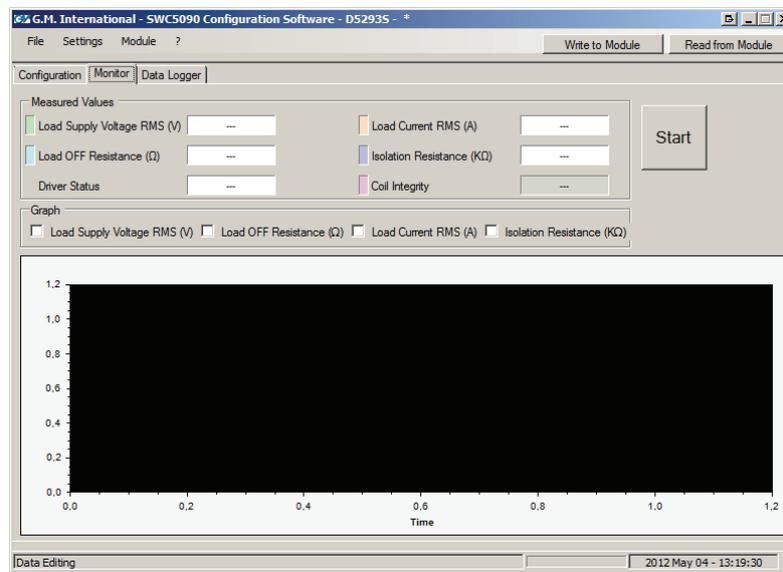


Fig. 31: Monitor Tab.

Measured Values (see Fig. 31) are periodically acquired from the field, when the Start/Stop is activated (odometer running in the Bottom Bar). When the Start/Stop button is deactivated, the **Measured Values** remain frozen to the last field acquisition value.

Measured Values include:

- ❑ **Load Supply Voltage RMS (V)**
indicates the RMS voltage that is actually applied (in ON State, load energized) or that will be applied (in OFF State, load de-energized) to the load.
- ❑ **Load Current RMS (A)**
represents the RMS current that is flowing through the load (hence it will be zero in OFF state).
- ❑ **Load OFF Resistance (Ω)**
is the load resistance measured in OFF State. In ON State, this value will remain at the saturation value (5 kΩ)
- ❑ **Isolation Resistance (kΩ)**
shows the leakage resistance to earth. Also the Isolation Resistance is measured only in OFF State; during ON State, it goes to the saturation value of 3 MΩ
- ❑ **Coil Integrity**
monitors the status of the relay coil in ON State: "FAIL" indicates that a relay coil is in short-circuit
- ❑ **Driver Status**
indicates whether the load has been energized ("ON") or not ("OFF")

See Section 3.6.1.4 for the explanation of the color indicators on the left.

3.6.2.2 Graph

It is possible to show the value of a variable on a graph. To do so, start acquisition by pressing the Start button and then select the desired variable by checking the corresponding checkbox.

Note that only one variable can be seen at a time.

3.6.3 Examples and Applications

Detailed examples of D5293S and D5294S configurations and applications can be found in a dedicated application note APN0036 which can be found on our website www.gmintsr.com

4 Monitor

The SWC5090 is able to continuously scan the module and display real-time values on screen. A graph of the chosen variable (Input or Output) can also be displayed.

Please refer to modules specific chapters for more details on this feature.

5 Data Logger

The SWC5090 can monitor and record data from them module at constant time intervals.

Data is stored on a Comma Separated Value file (.CSV).

Please refer to modules specific chapters for more details on this feature.

6 Configuration File

Each time the main User Interface window is closed, a configuration file (SWC5090.ini) is saved in the installation directory. The configuration file contains the last COM port used for the configuration and other parameters related to the software.

7 Report sheet

The SWC5090 can print the full configuration set in A4 format. Below an example configuration report.

 Configuration Report	
Model: D5273S	Serial:
Date: 2012 May 04	
Input 1	
Tag	0
Sensor Connection	TC
Sensor Type	TC A1
Downscale (°C)	0.0
Upscale (°C)	0.0
Cold Junction Source	Automatic
Cold Junction Reference (°C)	0.0
Integration Speed	slow
Mains Frequency	50 Hz
Output 1	
Function	Input 1
Type	4-20 mA Sink
Downscale (µA)	4000
Upscale (µA)	20000
Under Range (µA)	3600
Over Range (µA)	20800
Fault Output Value	22000
Faults	
Burnout	Inactive
Internal Fault	Inactive
Sensor Out Of Range	Inactive
Out Saturation	Inactive
Module Out Of Temperature Range	Inactive

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 Configuration Report	
Model: D5273S	Serial:
Date: 2012 May 04	
Alarm A	
Source	Input 1
Type	None
In case of Fault	Ignore
Condition	NE
Low Set (°C)	0.0
High Set (°C)	0.0
High Hysteresis (°C)	0.0
Low Hysteresis (°C)	0.0
Off Delay (s)	0.0
On Delay (s)	0.0
Faults	
Burnout	Inactive
Internal Fault	Inactive
Sensor Out Of Range	Inactive
Module Out Of Temperature Range	Inactive
Alarm B	
Source	Input 1
Type	None
Fault	Ignore
Condition	NE
Low Set (°C)	0.0
High Set (°C)	0.0
High Hysteresis (°C)	0.0
Low Hysteresis (°C)	0.0
Off Delay (s)	0.0
On Delay (s)	0.0
Faults	
Burnout	Inactive
Internal Fault	Inactive
Sensor Out Of Range	Inactive
Module Out Of Temperature Range	Inactive
Notes:	
Configured by:	Configured for
G.M. International srl Via San Fiorano 70 - 20062 Vinasanta (MS) ITALY phone +39 039 2325035 - fax +39 039 2325107 - web: www.gminterni.com	

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Fig. 32: Configuration Report example

8 Installation and quick start

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

8.1 Installing the PPC5092 USB-to-MiniUSB Adapter driver

To install the adapter the user has the choice between:

- running the PPC5092.exe file located in the SWC5090 drivers directory;
- clicking on the “Install PPC5092” link in the “Programs Menu/SWC5090” directory;
- clicking on “Install PPC5092 drivers” voice inside the “?” menu in the SWC5090 software.

Please install PPC5092 drivers before inserting the adapter into an USB port of the PC.

After the installation has completed, insert the adapter in any available USB port.

8.2 Installing the SWC5090 Configuration Software

In case a previous version of the SWC5090 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 (SWC5090) will be added to the program startup menu and to the Desktop at the end of the process.