

Iso-Gard™ Series 6 Line Isolation Monitor

ENGLISH

Instruction Bulletin

MED10110103

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Retain for future use.



Hazard Categories and Special Symbols

Read these instructions carefully and look at the equipment to become familiar with the device before trying to install, operate, service or maintain it. The following special messages may appear throughout this bulletin or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.



The addition of either symbol to a “Danger” or “Warning” safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠ DANGER

DANGER indicates an imminently hazardous situation which, if not avoided, **will result in** death or serious injury.

⚠ WARNING

WARNING indicates a potentially hazardous situation which, if not avoided, **can result in** death or serious injury.

⚠ CAUTION

CAUTION indicates a potentially hazardous situation which, if not avoided, **can result in** minor or moderate injury.

NOTICE

NOTICE is used to address practices not related to physical injury. The safety alert symbol is not used with this signal word.

NOTE: Provides additional information to clarify or simplify a procedure.

Please Note

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

Table of Contents

Introduction	5
Bus Capability	5
Safety Precautions	6
Installation and Connection	7
Screw Mounting the Iso-Gard Series 6 LIM	7
Wiring	8
Connector Plate	9
Terminal RI2 for Remote Annunciation and Testing (for Remotes with No Bus Capability)	10
Wiring Diagrams	10
Iso-Gard Series 6 LIM.....	10
IG2000P and Iso-Gard Series 6 LIM	11
IGR and Iso-Gard Series 6 LIM	12
RS-485 Communication Bus Termination	13
Operation and Settings	14
Front Panel Display—System Normal Condition	14
Front Panel Display—Alarm Condition	15
Displaying Measured Values	16
List of Indicators	16
Procedure for Functional Test of the Iso-Gard Series 6 LIM	16
Factory Settings	17
Navigation Through the Menu	18
Settings Controls	18
How to Access the Main Menu	18
Entering the Password.....	18
Exiting the Menu	18
Menu Settings	20
Main Menu	20
Menu: VALUES.....	20
Menu: HISTORY	21
Menu: DATALOG.....	21
Menu: SETTING	22
Menu: SETTING/GENERAL	22
Menu: SETTING/RELAY	23
Menu: SETTING / BUZZER.....	24
Menu: SETTING / HISTORY	24
Menu: SETTING / DATALOG	25
Menu: SETTING / INTERFACE (bus address).....	25
Menu: SETTING / CLOCK.....	26
Menu: SETTING / PASSWORD	26
Menu: SETTING / FACTORY SETTING	26
Menu: SETTING / SERVICE	26
Menu: CONTROL / TEST (carrying out tests via the menu).....	27
Menu: CONTROL / COMMUNICATION TEST	27
Menu: INFO	27
Periodic Testing	27
Messages from the RS-485 Communication Bus	28
Alarm Messages	28
Operating Status Messages	28
Technical Data	29
Detected Error Codes and Troubleshooting	32
Ordering information	32

List of Figures

Figure 1:	Iso-Gard Series 6 LIM Dimensions and Mounting Holes	7
Figure 2:	Connector Plate Terminals	9
Figure 3:	Iso-Gard Series 6 LIM Wiring Diagram	10
Figure 4:	IG2000P and Iso-Gard Series 6 LIM Wiring Diagram	11
Figure 5:	IGR and Iso-Gard Series 6 LIM Wiring Diagram	12
Figure 6:	RS-485 Termination Switch (factory setting shown)	13
Figure 7:	Bus Device Wiring Schematic	13
Figure 8:	Front Panel Display—Normal Condition	14
Figure 9:	Front Panel Display—Alarm Condition	15

List of Tables

Table 1:	Remote Indicator Cross Reference.....	8
Table 2:	Connector Plate Terminals Description	9
Table 3:	Mute Functions	10
Table 4:	Menu Structure	19
Table 5:	Iso-Gard Series 6 LIM Technical Data.....	29
Table 6:	Connector Plate Technical Data	31

Introduction

The Iso-Gard™ Series 6 Line Isolation Monitor (LIM) from Schneider Electric measures the impedance of a monitored isolated power system to ground. The LIM then uses this value to calculate the maximum Total Hazard Current (THC), which is the calculated maximum fault current passing through a human body if live conductors of the isolated power system were touched. THC is continuously displayed in mA on the front panel of the LIM.

In addition to the continuous digital display, a colored LED bar graph provides indication of THC in the system. Depending on the system condition, the word SAFE or HAZARD is displayed prominently on the face of the LIM, coupled with a green (normal condition) or red (hazard condition) LED.

The Iso-Gard Series 6 LIM is designed to monitor isolated power systems with voltages of 100–240 Vac at 50 Hz or 60 Hz.

Bus Capability

References to devices with “bus capability” will appear throughout this manual. The Iso-Gard Series 6 LIM, as well as some remote indicators, feature a two-way, RS-485 communication system using a proprietary bus protocol. Devices utilizing this bus generally require fewer connections and can communicate more information remotely.

If you are using remote indicators with the Iso-Gard Series 6 LIM, certain instructions may change based on whether the remote does or does not have bus capability. Ensure that you are following the proper instructions when wiring and setting up the device.

- Remotes with no bus capability: IG2000P series (any combination)
- Remote with bus capability: IGR

For more information, refer to the wiring diagram specific to the remote you are using.

Safety Precautions

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E or CSA Z462.
- This equipment must be installed and serviced only by qualified electrical personnel.
- Turn off all power supplying this equipment before working on or inside equipment.
- Always use a properly rated voltage sensing device to confirm power is off.
- Replace all devices, doors, and covers before turning on power to this equipment.

Failure to follow these instructions will result in death or serious injury.

CAUTION

HAZARD OF UNAUTHORIZED MODIFICATIONS

- Do not make modifications to this equipment.
- Only use accessories supplied by or recommended by Schneider Electric with this equipment.

Failure to follow these instructions can result in personal injury or equipment damage.

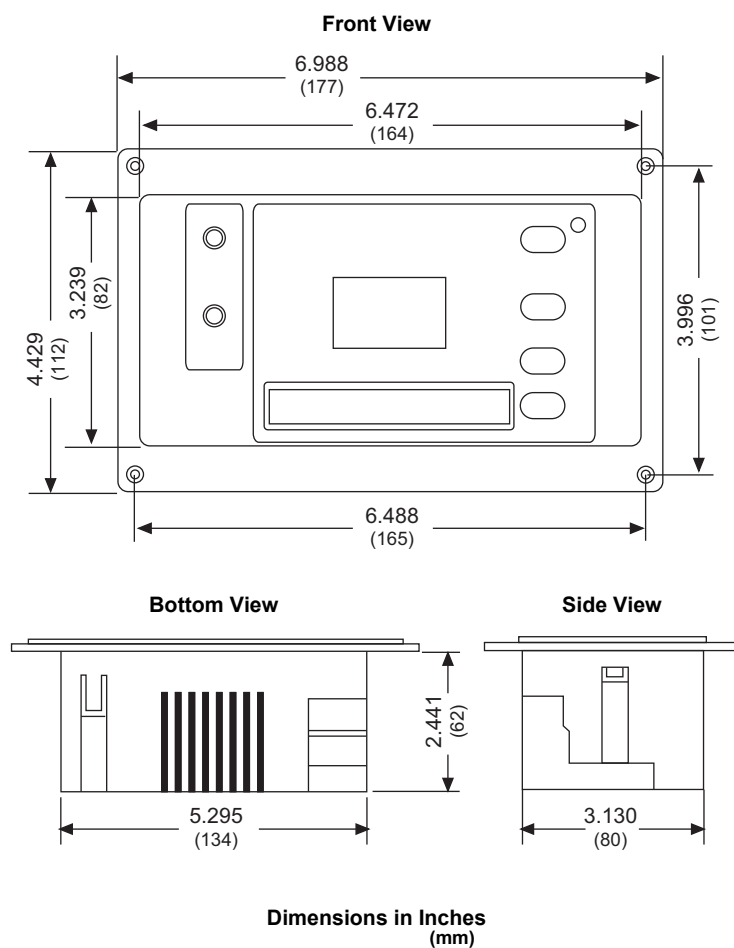
Installation and Connection

Screw Mounting the Iso-Gard Series 6 LIM

The front plate provides four holes for screw mounting.

- Hole diameter is 1/8 in. (3.2 mm)
- Recommended screws are #4-40, oval head, black-oxide finished
- Torque range is 2.8–3.5 lb-in (0.32–0.40 N•m)

Figure 1: Iso-Gard Series 6 LIM Dimensions and Mounting Holes



Wiring

The Iso-Gard Series 6 LIM connects to a connector plate assembly. Follow these instructions to ensure proper connection and installation of the LIM.

Units labeled as having “bus capability” have the ability to connect to the Iso-Gard Series 6 LIM via a two-way RS-485 communication protocol.

The Iso-Gard Series 6 LIM is designed to monitor isolated power systems with voltages of 100–240 Vac at 50 Hz or 60 Hz.

NOTICE

HAZARD OF OVERVOLTAGE DAMAGE

Do not apply a voltage higher than the maximum rated voltage to the Iso-Gard Series 6 LIM.

Failure to follow these instructions can result in equipment damage.

1. Locate the proper wiring diagram from Table 1. Note which remote indicator and connector plate have been supplied. Wiring varies depending on these components.
2. Before mounting the LIM, plug the connector plate into the LIM.
3. Make the connections according to the wiring diagram for the components required.
4. Turn ON power to the LIM. If no error messages are displayed, the LIM is operating properly. See the Operation and Settings section starting on page 14 for more information.

Table 1: Remote Indicator Cross Reference

Device Combination	Bus Compatible	Wiring Diagram
Iso-Gard Series 6 LIM only	No	page 10
Iso-Gard Series 6 LIM + IG2000P	No	page 11
Iso-Gard Series 6 LIM + IGR	Yes	page 12

Connector Plate

Figure 2: Connector Plate Terminals

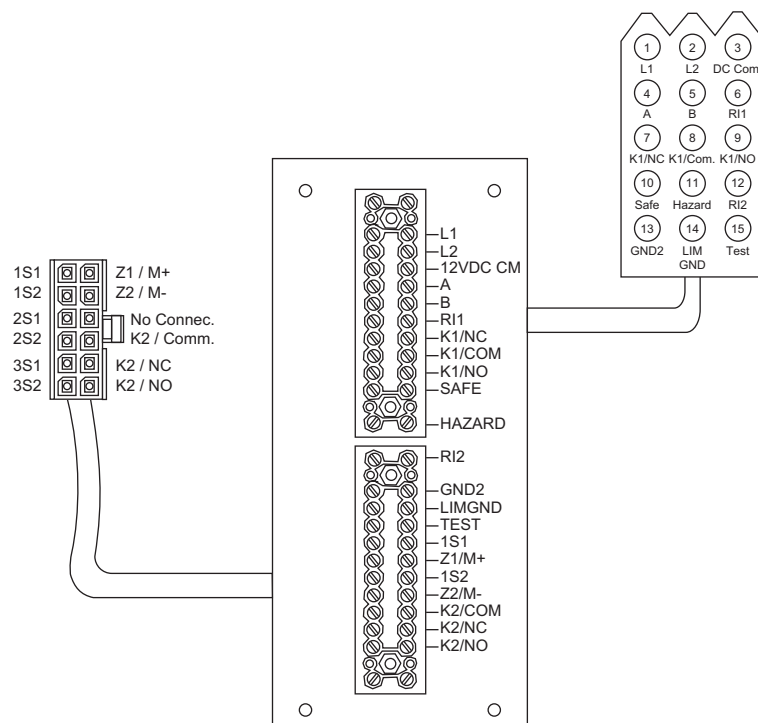


Table 2: Connector Plate Terminals Description

Terminal	Description
L1, L2	Connection to the isolated power system to be monitored.
12V DC CM	Common connection for Iso-Gard alarm indicator and test combinations, up to four (200 mA)
A, B	RS-485 interface, communication bus
RI1	+12 V connection for the Test button of the Iso-Gard alarm indicator and test combination or voltage supply of the IG2000P remote indicator
K1/NC K1/COM K1/NO	N/C contact of alarm relay K1 Common contact of K1 N/O contact of K1
SAFE	System Normal signal for Iso-Gard alarm indicator and test combination that does not have bus compatibility
HAZARD	System Hazard signal for Iso-Gard alarm indicator and test combination that does not have bus compatibility
RI2	Mute function for Iso-Gard alarm indicators that do not have bus compatibility
GND2 LIMGND	Separate connections to ground
TEST	Connection for testing the Iso-Gard Series 6 LIM from any Iso-Gard alarm indicator that does not have bus compatibility
K2/COM K2/NC K2/NO	Common contact of alarm relay K2 N/C contact of K2 N/O contact of K2
Z1/M+, Z2/M-	Connection Z1/Z2 for over-temperature sensor or connection M+/M- for external measuring instrument for the indication of the THC

Terminal RI2 for Remote Annunciation and Testing (for Remotes with No Bus Capability)

Remote indicators that do not have bus capability may be muted collectively by connecting terminals 7 and 8 on the remote to terminal RI2 on the Iso-Gard Series 6 LIM. No matter how the wiring is configured, each respective device is able to mute itself. Wiring between the remote and the LIM will affect whether a particular device will mute more than the device itself. See Table 3 for details.

Table 3: Mute Functions ¹

Iso-Gard Series 6 LIM	IG2000P		Mute Function
	Terminal 7	Terminal 8	
Terminal RI2			
—	—	—	Only the local device will be muted.
X	X	—	LIM Mute button mutes LIM and IG2000P.
X	—	X	IG2000P Mute button mutes LIM and IG2000P.
X	X	X	Both Mute buttons will mute both devices.

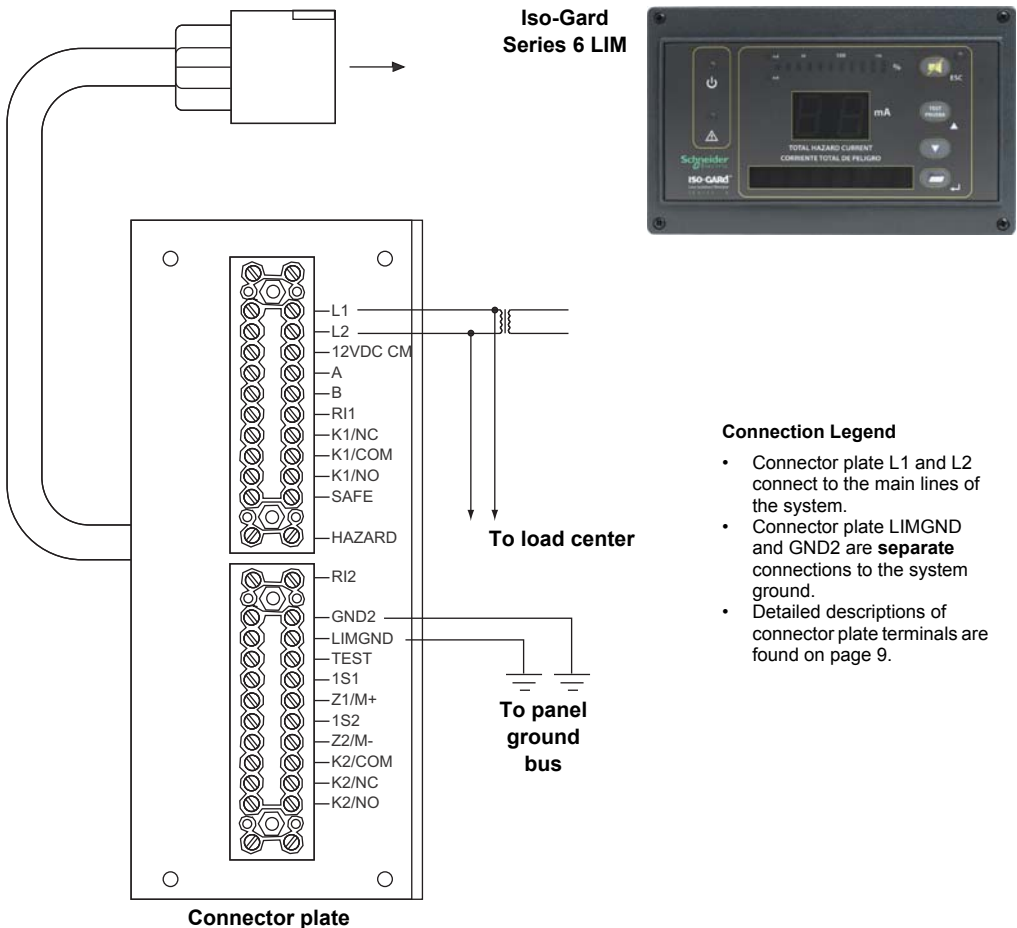
¹ X = terminal connected.

Wiring Diagrams

Iso-Gard Series 6 LIM

No remote indication is provided with this connection method.

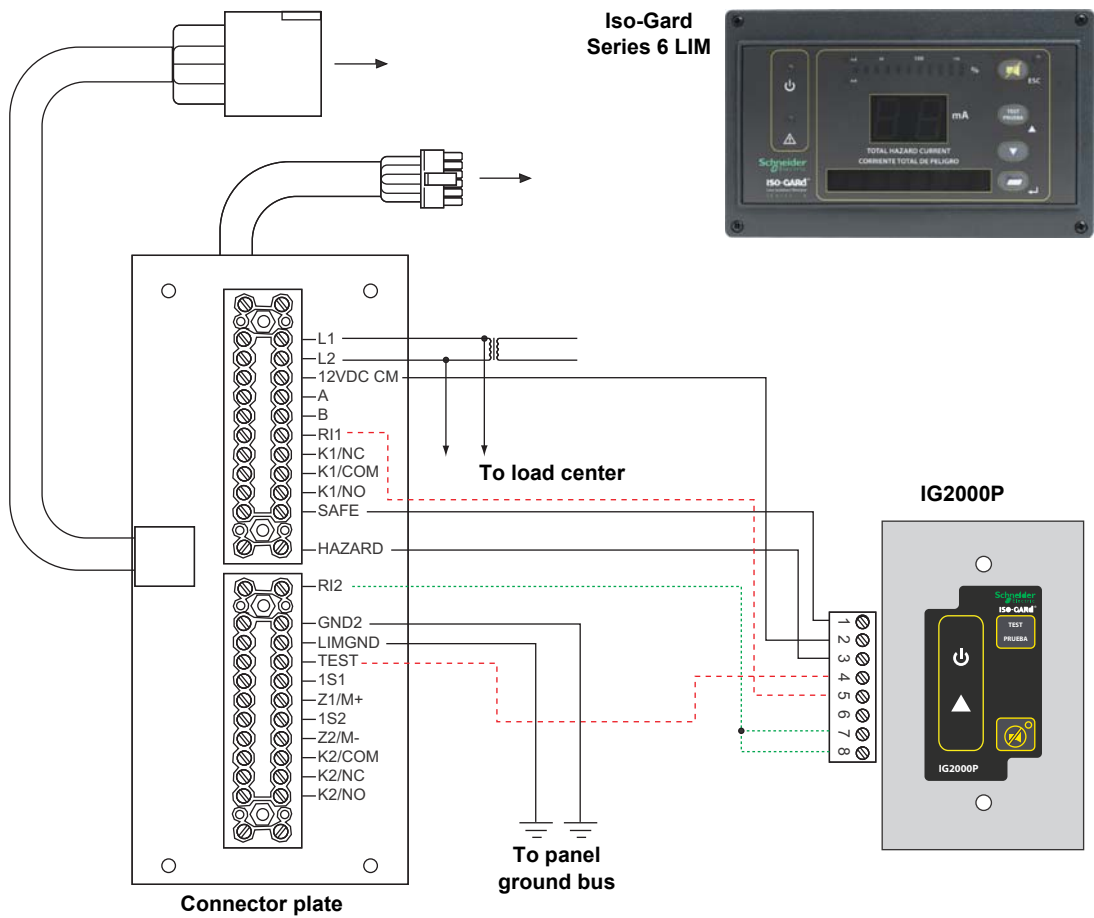
Figure 3: Iso-Gard Series 6 LIM Wiring Diagram



IG2000P and Iso-Gard Series 6 LIM

This remote provides a green LED, a red hazard LED, a Mute button and LED, and a Test button.

Figure 4: IG2000P and Iso-Gard Series 6 LIM Wiring Diagram

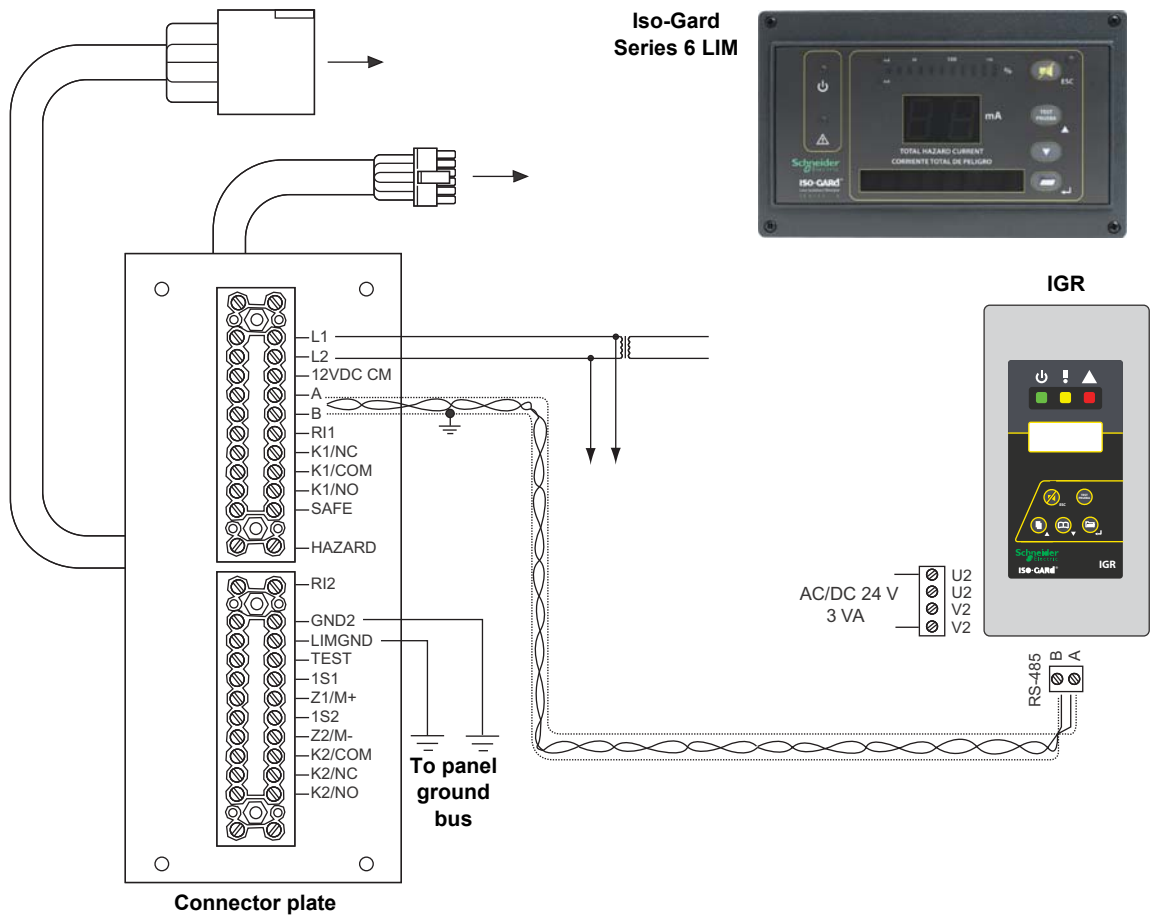


Legend	Description
—	Connections required in systems using IG2000P.
...	Additional connections required for "System Muting" option.
---	Additional connections required for "Test" option.

IGR and Iso-Gard Series 6 LIM

This remote provides a green LED, a red hazard LED, a Mute button and a Test button.

Figure 5: IGR and Iso-Gard Series 6 LIM Wiring Diagram



Legend	Description
—	Connections required in systems using IGR.
Terminals A,B	Refer to termination configuration on page 13.

The terminal designations of the connector plates are described on page 9.

RS-485 Communication Bus Termination

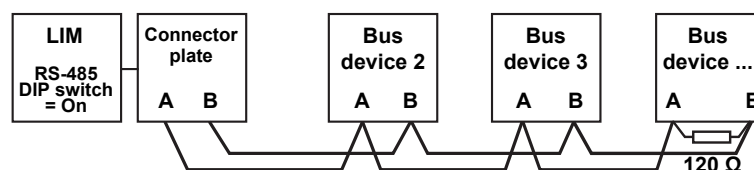
This section only applies when using remote indicators that have bus capability. If there is an Iso-Gard Series 6 LIM at the beginning or the end of a bus, set the RS-485 termination DIP switch on the top of the LIM to “on.” The factory setting is “off.”

Figure 6: RS-485 Termination Switch (factory setting shown)



If several bus devices are connected with each other, the interfaces should be wired according to the schematic shown in Figure 7. Depending on the device, the termination is carried out via the RS-485 DIP switch or a 120 Ω resistor connected in parallel.

Figure 7: Bus Device Wiring Schematic



Operation and Settings

Front Panel Display—System Normal Condition

Figure 8 shows the Iso-Gard Series 6 LIM in the system normal condition, with all possible indications.

Figure 8: Front Panel Display—Normal Condition

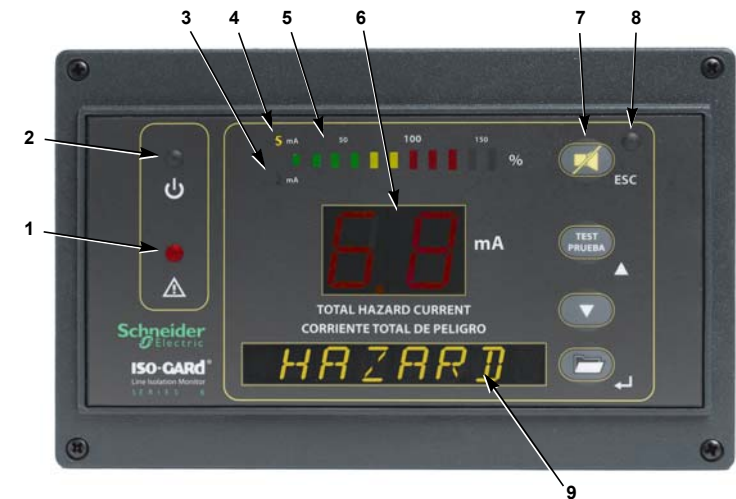


Item	Description
1	Red hazard LED: Not illuminated
2	Green LED: Illuminated. Will be in a system normal condition when the displayed Total Hazard Current is below the response value (2 mA for Canada, 5 mA for USA).
3	Measuring range indicator light (yellow). Illuminates when the 2 mA THC response value (Canada) has been activated.
4	Measuring range indicator light (yellow). Illuminates when the 5 mA THC response value (U.S.) has been activated.
5	LED bar graph: In a system normal condition, only the green bars are illuminated.
6	Seven-segment display of currently read Total Hazard Current: Green in color for a system normal condition.
7	ESC key: Moves to a higher level in the menu
8	Mute LED: Not illuminated in a system normal condition.
9	Test button: Activates self-test. Up key: Moves up in the menu and increases values.
10	Down key: Moves down in the menu and decreases values.
11	Menu button: Enters Menu mode. Enter key: Confirms entries.
12	Digital display: Reads SAFE in a system normal condition. Also displays menu options when in Menu mode.

Front Panel Display—Alarm Condition

When the measured Total Hazard Current exceeds the set response value, the Iso-Gard Series 6 LIM will go into an alarm condition. When this happens, the audible alarm will activate. Pressing the Mute button silences the audible alarms and illuminates the yellow Mute LED. When the detected fault is cleared, the LIM will go back to the system normal condition. Figure 9 shows the Iso-Gard Series 6 LIM in the alarm condition, with all possible indications.

Figure 9: Front Panel Display—Alarm Condition



Item	Description
1	Red hazard LED: Flashes red.
2	Green LED: Not illuminated.
3	Measuring range indicator light (yellow). Illuminates when the 2 mA THC response value (Canada) has been activated.
4	Measuring range indicator light (yellow). Illuminates when the 5 mA THC response value (U.S.) has been activated.
5	LED bar graph: Indicates Total Hazard Current. In a system alarm condition, the red bars will be illuminated.
6	Seven-segment display of currently read Total Hazard Current: Illuminated red in a system alarm condition.
7	Mute button: Pressing the Mute button will silence the audible alarm and activate the yellow Mute LED.
8	Mute LED: Will illuminate yellow after the Mute button has been pressed and the detected fault is still on the system.
9	Digital display: Reads HAZARD.

Displaying Measured Values

The Total Hazard Current is displayed in real-time on the numeric display in the middle of the device. For retrieving other measured values, such as load current or impedance, refer to the menu item "1.VALUES." For details, see page 20.

List of Indicators

The following table lists the various types of alarms available and their corresponding indications.

THC Digital Indication	THC LED Bar Graph Indicator	Text Display	Green LED	Red Hazard LED	Audible Alarm
< 3.6 mA (U.S.) < 1.4 mA (Canada) (system normal condition)	green	SAFE	on	off	off
3.6–4.9 mA (U.S.) 1.4–1.9 mA (Canada) (system normal condition, with caution yellow LED bar graph)	green + yellow	SAFE	on	off	off
≥ 5 mA (U.S.) ≥ 2 mA (Canada) (alarm condition)	green + yellow + red	HAZARD	off	on	on
E.F. (U.S.) E.F. (Canada) (alarm condition) ¹	green + yellow + red	HAZARD	off	on	on

¹ E.F. = extreme fault, that is, the detected leakage current exceeds the maximum display value of 9.9 mA.

Procedure for Functional Test of the Iso-Gard Series 6 LIM

The Iso-Gard Series 6 LIM may be tested while the isolated power system is online. Press the Test button for approximately two seconds to start a functional test. The following will occur:

1. The entire LED bar graph will illuminate.
2. The digital display at the bottom of the front plate will display TEST.
3. The digital indicator will flash.
4. The audible alarm will sound.
5. The red hazard LED will illuminate.
6. If no detected fault exists, the text OK will appear in the text field. The device will then return to the system normal condition. The text SAFE will display on the digital display and the green LED will illuminate.

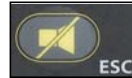
Factory Settings

Parameter Description	Display		Value Range	Factory Setting
Total Hazard Current	GENERAL	THC	2 mA, 5 mA	5 mA
Current Transformer Type	GENERAL	CT	off, STW3, STW4, STWL	off
Maximum Load Current	GENERAL	LOAD	off, 10–200 A	off
Undervoltage	GENERAL	U<	off, 80–300 V	off
Overvoltage	GENERAL	U>	off, 80–300 V	off
Isolation Impedance	GENERAL	Z	off, 10–200 kΩ	off
Isolation Resistance	GENERAL	R	off, 20–200 kΩ	off
Temperature Monitoring	GENERAL	TEMP	off, on	off
Detected Fault Location	GENERAL	F.LOC	off, auto	off
Response Delay t_{on}	GENERAL	T.on	0s–99s	0s
Release Delay t_{off}	GENERAL	T.off	0s–99s	0s
Test Cycle	GENERAL	TEST	1h–24h	1h
Relay 1 Operation	REL. NO. 1		N/O, N/O-T, N/C, N/C-T	N/C-T
Relay 1 Alarm THC	REL. NO. 1	THC	off, on	on
Relay 1 Alarm Overload	REL. NO. 1	LOAD	off, on	off
Relay 1 Alarm Undervoltage	REL. NO. 1	U<	off, on	off
Relay 1 Alarm Overvoltage	REL. NO. 1	U>	off, on	off
Relay 1 Alarm Impedance	REL. NO. 1	Z	off, on	off
Relay 1 Alarm Resistance	REL. NO. 1	R	off, on	off
Relay 1 Alarm Temperature	REL. NO. 1	TEMP	off, on	off
Relay 1 Alarm System	REL. NO. 1	SYS	off, on	off
Relay 2 Operation	REL. NO. 2		N/O, N/O-T, N/C, N/C-T	N/C-T
Relay 2 Alarm THC	REL. NO. 2	THC	off, on	off
Relay 2 Alarm Overload	REL. NO. 2	LOAD	off, on	on
Relay 2 Alarm Undervoltage	REL. NO. 2	U<	off, on	on
Relay 2 Alarm Overvoltage	REL. NO. 2	U>	off, on	on
Relay 2 Alarm Impedance	REL. NO. 2	Z	off, on	on
Relay 2 Alarm Resistance	REL. NO. 2	R	off, on	on
Relay 2 Alarm Temperature	REL. NO. 2	TEMP	off, on	on
Relay 2 Alarm System	REL. NO. 2	SYS	off, on	on
Audible Alarm Volume	BUZZER	VOL	High, Low	High
System Mute	BUZZER	SY.MU	off, on	on
Audible Alarm Overload	BUZZER	LOAD	off, on	on
Audible Alarm Undervoltage	BUZZER	U<	off, on	on
Audible Alarm Overvoltage	BUZZER	U>	off, on	on
Audible Alarm Impedance	BUZZER	Z	off, on	on
Audible Alarm Resistance	BUZZER	R	off, on	on
Audible Alarm Temperature	BUZZER	TEMP	off, on	on
Audible Alarm System	BUZZER	SYS	off, on	on
Data logger Channel THC Change	DATALOG	CHAN.THCH	0–100%	10%
Data logger Channel THC Overwrite	DATALOG	CHAN.THCH	no, yes	no
Data logger Channel U.12 Change	DATALOG	CHAN.U.12	0–100%	10%
Data logger Channel U.12 Overwrite	DATALOG	CHAN.U.12	no, yes	no
Data logger Channel U.1E Change	DATALOG	CHAN.U.1E	0–100%	10%
Data logger Channel U.1E Overwrite	DATALOG	CHAN.U.1E	no, yes	no
Data logger Channel U.2E Change	DATALOG	CHAN.U.2E	0–100%	10%
Data logger Channel U.2E Overwrite	DATALOG	CHAN.U.2E	no, yes	no
Data logger Channel Z Change	DATALOG	CHAN.Z	0–100%	10%
Data logger Channel Z Overwrite	DATALOG	CHAN.Z	no, yes	no
Data logger Channel R Change	DATALOG	CHAN.R	0–100%	10%
Data logger Channel R Overwrite	DATALOG	CHAN.R	no, yes	no
Data logger Channel I.1 Change	DATALOG	CHAN.I.1	0–100%	10%
Data logger Channel I.1 Overwrite	DATALOG	CHAN.I.1	no, yes	no
Data logger Channel I.2 Change	DATALOG	CHAN.I.2	0–100%	10%
Data logger Channel I.2 Overwrite	DATALOG	CHAN.I.2	no, yes	no
Data logger Channel I.3 Change	DATALOG	CHAN.I.3	0–100%	10%
Data logger Channel I.3 Overwrite	DATALOG	CHAN.I.3	no, yes	no
Bus Address	INTRFCE	ADR.	1–90	1 (Master)
Daylight-Saving-Time Change	CLOCK	DST	off, auto	auto
Password	PASSWRD	PSWD***	0–999	807
Password Status (Lock)	PASSWRD	LOCK	off, on	on

Navigation Through the Menu

Settings Controls

Use the following buttons and text display to change menu settings in Menu mode.



ESC key: Jump to a higher level in the menu; discard entries



UP key: Move up in the menu; increase values



DOWN key: Move down in the menu; decrease values



MENU: Enter Menu mode
Enter (↵): Select the next menu level; confirm entries



Text display for Menu mode

How to Access the Main Menu

Hold the MENU button for at least one second. The device will enter into Menu mode. The first item in the menu, 1.VALUES, will appear. The number "1" will flash.

Entering the Password

Most of the submenus may be password protected. If you are authorized to modify settings, follow these steps to enter the password:

1. A flashing number illustrates the current setting.
2. Use the UP/DOWN key to select the first correct digit of the password.
3. Confirm by pressing Enter (↵).
4. Proceed in the same way until the last digit of the password is confirmed.
5. Settings may be modified as long as you remain in the menu. Exiting the menu will require a re-entry of the password.

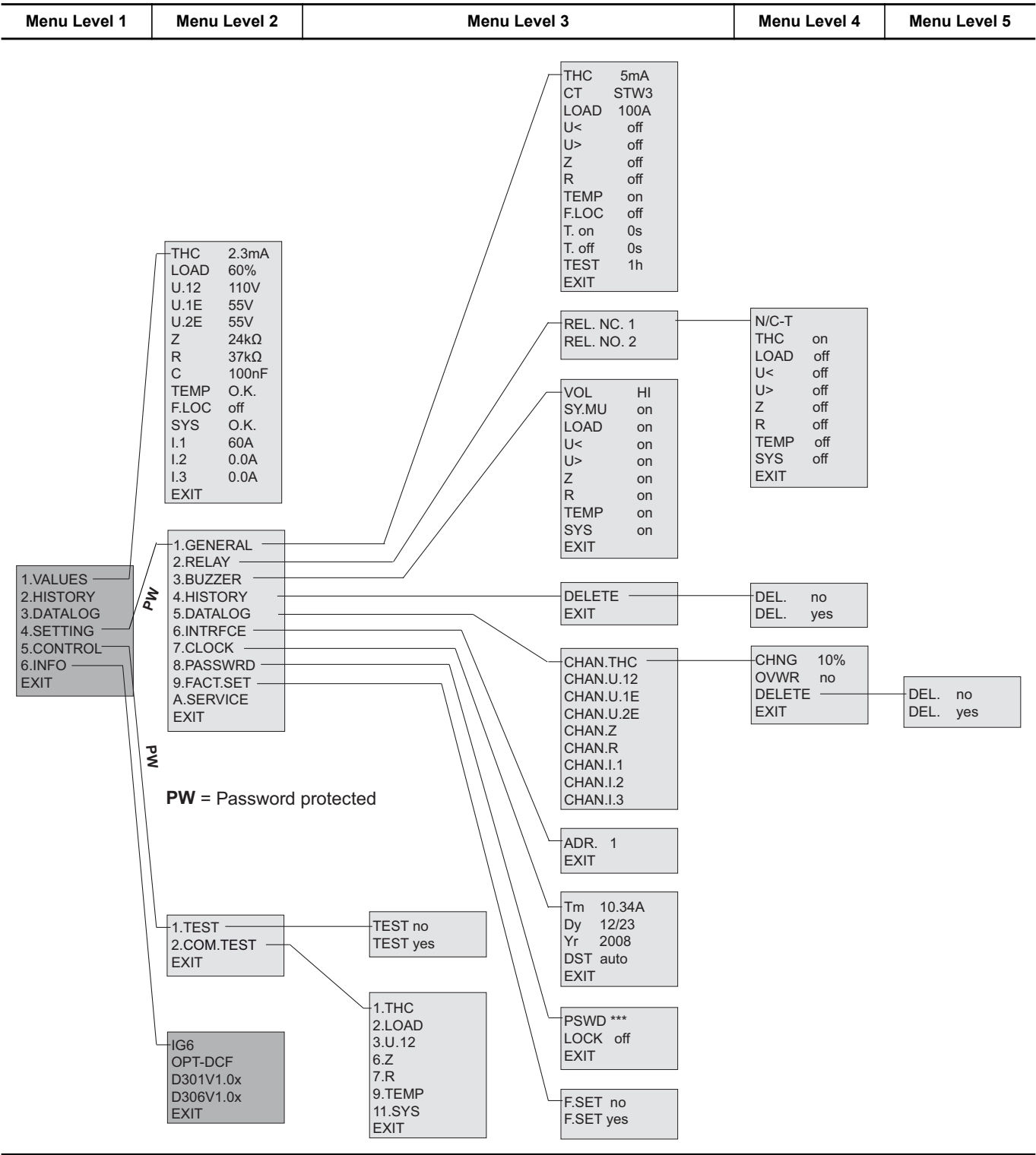
When a parameter is changed and confirmed by pressing Enter (↵), the change will have an immediate effect. The Iso-Gard Series 6 LIM will continue to operate while settings are changed.

Exiting the Menu

Press the ESC key to return to the last step in the menu. Repeat this step until you are out of the menu.

NOTE: If the Iso-Gard Series 6 LIM is idle for five minutes while in Menu mode, the system will automatically return to the main screen.

Table 4: Menu Structure



Menu Settings

Main Menu

This menu indicates the values being read in real-time. To step back in the menu, press the Mute/ESC button.



MENU Level 1	Meaning	Page
EXIT		
1. VALUES	Display all measured values in real-time	20
2. HISTORY	Display history of alarm messages	21
3. DATALOG	Data logging of selected parameters	21
4. SETTING	Change settings	22
5. CONTROL	Begin bus or device test	27
6. INFO	Display device information	27
EXIT		

Menu: VALUES

MENU Level 1	MENU Level 2 ¹	Meaning
	EXIT	
1. VALUES	THC 5mA	Total Hazard Current
	LOAD 60%	Max. load current [%]
	U.12 110V	Voltage between L1 and L2
	U.1E 55V	Voltage between L1 and ground
	U.2E 55V	Voltage between L2 and ground
	Z 24kΩ	Isolation impedance
	R 37kΩ	Isolation resistance
	C 100nF	Leakage capacitance
	TEMP O.K.	Transformer temperature indication
	F.LOC off	Status of the location test generator
	SYS O.K.	Status of the device
	I.1 60A	Load current measured from CT 1
	I.2 0.0A	Load current measured from CT 2
	I.3 0.0A	Load current measured from CT 3
	EXIT	

¹ Sample readings are shown on the right-hand side of this column.

Menu: HISTORY

This option displays a record of time-stamped alarms. After opening the menu option, the most up-to-date alarm will appear. Pressing the UP and DOWN arrow keys will scroll through the various information available. Pressing ENTER (↵) will display additional information regarding the alarm.

MENU Level 1	MENU Level 2	MENU Level 3	Meaning
		EXIT	
2. HISTORY	AL125. THC	START.THC	THC alarm with the consecutive number 125/ Start of the alarm:
		10 / 24 / 09	Date
		11.45 am	Time
		QUIT.THC	Mute of the alarm:
		10 / 24 / 09	Date
		11.45 am	Time
		END.THC	End of the alarm:
		10 / 25 / 09	Date
		9.30 am	Time
		MIN. 6.0mA	Minimum value of THC
		MAX. 9.9mA	Maximum value of THC
		EXIT	

Menu: DATALOG

Logging is provided for up to 300 data records.

MENU Level 1	MENU Level 2	MENU Level 3	Meaning
		EXIT	
3. DATALOG	CHAN. THC	THC 2 mA	Last value change
		11 / 30 / 09	Date
		03.45 am	Time
		288.THC 4mA	2nd to last value
		09 / 15 / 09	Date
		11.14 am	Time
		—	—
		—	—
		—	—
		1.THC 1mA	First stored value
		10 / 25 / 09	Date
		9.30 am	Time
		EXIT	

Menu: SETTING

This is the main settings menu. All changes to the device are made here.

⚠ CAUTION
HAZARD OF MODIFICATIONS BY UNQUALIFIED PERSONNEL
Menu settings are to be modified only by qualified maintenance personnel.
Failure to follow these instructions can result in personal injury or equipment damage.

MENU Level 1	MENU Level 2	Meaning
	EXIT	
4. SETTING	1. GENERAL	Change response values
	2. RELAY	Change relay operation
	3. BUZZER	Change audible alarm settings
	4. HISTORY	Erase history memory
	5. DATALOG	Set logging parameters
	6. INTERFACE	Change the LIM bus address
	7. CLOCK	Change time and date
	8. PASSWORD	Enable/disable/change the password
	9. FACT.SET	Reset to factory defaults
	A. SERVICE	Only for manufacturer service
	EXIT	

Menu: SETTING/GENERAL

Changes to the response values (THC, load monitoring, undervoltage, etc.) are made here. The additional alarms may be turned ON or OFF, along with any trip-level settings made.

MENU Level 1	MENU Level 2	MENU Level 3 ¹	Meaning
		EXIT	
4. SETTING	1. GENERAL	THC 5mA	Total Hazard Current: 2 mA / 5 mA
		CT off	Current transformer type: off / STW3 / STW4 / STWL
		LOAD off	Load current: off, 10–200 A
		U< off	Undervoltage: off, 80–300 V
		U> off	Overvoltage: off, 80–300 V
		Z off	Isolation impedance: off, 10–200 kΩ
		R off	Isolation resistance: off, 20–200 kΩ
		TEMP off	Transformer temperature control: off / on (off = current output, refer to page 15)
		F.LOC off	Start and stop conditions for EDS systems: test current generator off / auto
		T.ON 0s	Response delay: 0–99 s
		TOFF 0s	Release delay: 0–99 s
		TEST 1h	Self test interval: 1–24h
		EXIT	

¹ Factory settings are shown on the right-hand side of this column.

Menu: SETTING/RELAY

Settings related to the contact outputs are changed here. Each type of alarm may be set to trip the output contact. If an alarm is set to ON, it will change the state of the contact in the event of an alarm. If it is set to OFF, it will not change the state of the contact.

Additionally, the operation of the output relay may be changed here. The following denotes the options available and their meaning.

- N/C mode: Normally closed (energized) mode. The Iso-Gard Series 6 LIM will trip in the event of an alarm or a loss of power to the device.
- N/C-T mode: Normally closed (energized) mode with test enabled. The Iso-Gard Series 6 LIM will trip in the event of an alarm, a test, or a loss of power to the device.
- N/O mode: Normally open (de-energized) mode. The Iso-Gard Series 6 LIM will trip only in the event of an alarm.
- N/O-T mode: Normally open (de-energized) mode with test enabled. The Iso-Gard Series 6 LIM will trip in the event of an alarm or a test.

MENU Level 1	MENU Level 2	MENU Level 3	MENU Level 4 ¹	Meaning
			EXIT	
4. SETTING	2. RELAY	REL. NO. 1	N/C-T	The contact will trip in the event of an alarm, a test, or a loss of power to the device
			THC on	Relay 1 switches when a THC alarm occurs
			LOAD off	Relay 1 does not switch in the event of a LOAD alarm
			U< off	Relay 1 does not switch in the event of an undervoltage alarm
			U> off	Relay 1 does not switch in the event of an overvoltage alarm
			Z off	Relay 1 does not switch in the event of an insulation impedance alarm
			R off	Relay 1 does not switch in the event of an insulation resistance alarm
			TEMP off	Relay 1 does not switch in the event of a temperature alarm
			SYS off	Relay 1 does not switch in the event of a detected error
			EXIT	

¹ Factory settings are shown on the right-hand side of this column.

Menu: SETTING / BUZZER

Settings here relate to the audible alarm of the Iso-Gard Series 6 LIM. If a type of alarm is set to ON, it will activate the audible alarm when it goes into alarm. If it is set to OFF, the alarm will not activate the audible alarm.

MENU Level 1	MENU Level 2	MENU Level 3 ¹	Meaning
EXIT			
4. SETTING	3. BUZZER	VOL HI	Audible alarm volume: High or Low
		SY.MU on	System mute: on/off
		LOAD on	Audible alarm sounds in the event of an overload alarm
		U< on	Audible alarm sounds in the event of an undervoltage alarm
		U> on	Audible alarm sounds in the event of an overvoltage alarm
		Z on	Audible alarm sounds in the event of an insulation impedance alarm
		R on	Audible alarm sounds in the event of an insulation resistance alarm
		TEMP on	Audible alarm sounds in the event of a temperature alarm
		SYS on	Audible alarm sounds in the event of a detected error
EXIT			

¹ Factory settings are shown on the right-hand side of this column.

Menu: SETTING / HISTORY

Selecting YES will erase the history of alarms on the device.

NOTE: Once the history is erased, it cannot be recovered.

MENU Level 1	MENU Level 2	MENU Level 3	MENU Level 4 ¹	Meaning
EXIT				
4. SETTING	4. HISTORY	DELETE	DEL. no	Erase history memory: yes or no
EXIT				

¹ Factory settings are shown on the right-hand side of this column.

Menu: SETTING / DATALOG

This menu controls how often data is recorded in the history log of the Iso-Gard Series 6 LIM. The number of records is controlled by changing the minimum percentage difference between two values. When that threshold is reached or exceeded, data will be recorded.

Example: if the “CHNG” item is set to 10%, a difference between two values of 10% or greater will record an event to the history log.

MENU Level 1	MENU Level 2	MENU Level 3	MENU Level 4 ¹	MENU Level 5 ¹	Meaning
			EXIT		
4. SETTING	5. DATALOG	CHAN. THC	CHNG 10%		Change in limiting value: 5–100%
		CHAN. U.12	OVWR no		Overwrite full memory: yes or no; overwrite is FIFO
		CHAN. U.1E	DELETE	DEL. no	Delete data log: yes or no; clears all data
		CHAN. U.2E	Not user adjustable		
		CHAN. Z			
		CHAN. R			
		CHAN. I.1			
		CHAN. I.2			
		CHAN. I.3			
			EXIT		

¹ Factory settings are shown on the right-hand side of this column.

Menu: SETTING / INTERFACE (bus address)

This menu controls the bus address of the Iso-Gard Series 6 LIM. In most cases, this option should be set to 1.

MENU Level 1	MENU Level 2	MENU Level 3 ¹	Meaning
		EXIT	
4. SETTING	6. INTRFCE	ADR. 1	Setting range: 1–90
		EXIT	

¹ Factory settings are shown on the right-hand side of this column.

Menu: SETTING / CLOCK

Use this menu to change the time and date settings.

MENU Level 1	MENU Level 2	MENU Level 3 ¹	Meaning
		EXIT	
4. SETTING	7. CLOCK	Tm 10.34 A	Time: am/pm
		Dy 12/23	Month/day
		Yr 2009	Year
		DST auto	Daylight saving time: auto/off (North America time zones only)
		EXIT	

¹ Factory settings are shown on the right-hand side of this column.

Menu: SETTING / PASSWORD

Use this menu to change password protection.

MENU Level 1	MENU Level 2	MENU Level 3 ¹	Meaning
		EXIT	
4. SETTING	8. PASSWRD	PSWD ***	Password range: 000–999 Factory setting: 807
		LOCK on	Password protection activated (on) or deactivated (off)
		EXIT	

¹ Factory settings are shown on the right-hand side of this column.

Menu: SETTING / FACTORY SETTING

Use this menu to reset the device to factory defaults.

NOTE: Once the device is reset to factory defaults, it cannot be restored to any previous state automatically. Any important changes to settings must be re-entered.

MENU Level 1	MENU Level 2	MENU Level 3 ¹	Meaning
		EXIT	
4. SETTING	9. FACT.SET	F.SET no	Keeps current settings
		yes	Restores settings to the factory defaults shown on page 17
		EXIT	

¹ Factory settings are shown on the right-hand side of this column.

Menu: SETTING / SERVICE

This menu is intended for service by Schneider Electric only.

Menu: CONTROL / TEST (carrying out tests via the menu)

With this menu, all Iso-Gard remote indicators with bus capability are able to enforce a device self-test on the Iso-Gard Series 6 LIM.

MENU Level 1	MENU Level 2	MENU Level 3 ¹	Meaning
		EXIT	
5. CONTROL	1. TEST	TEST no	Test deactivated
		yes	Test will be activated
		EXIT	

¹ Factory settings are shown on the right-hand side of this column.

Menu: CONTROL / COMMUNICATION TEST

This menu enables testing of the RS-485 communication bus between the Iso-Gard Series 6 LIM and other bus compatible devices.

MENU Level 1	MENU Level 2	MENU Level 3	Meaning
		EXIT	
5. CONTROL	2. COM.TEST	1.THCH	Send THCH alarm message via the bus
		2.LOAD	Send overload alarm message via the bus
		3.U.12	Send overvoltage alarm message via the bus
		6.Z	Send low impedance alarm message via the bus
		7.R	Send low resistance alarm message via the bus
		9.TEMP	Send over-temperature alarm message via the bus
		11.SYS	Send system alarm message via the bus
		EXIT	

Menu: INFO

This menu option displays important information regarding the hardware and software of the Iso-Gard Series 6 LIM.

MENU Level 1	MENU Level 2	Meaning
	EXIT	
6. INFO	IG6	Device type
	OPT -DCF	Option of the device
	D301 V1.0x	Software version of measurement technique
	D306 V1.0x	Communication software version
	EXIT	

Periodic Testing

NFPA-99 requires testing of Isolated Power Systems prior to placing them into service and periodically thereafter. Schneider Electric recommends testing Isolated Power Systems not less than once every twelve months. The testing is intended to maintain the minimum levels as described in NFPA-99. It should consist of resistive and capacitive testing to verify the proper functions of the LIM.

Schneider Electric further recommends pushing the Test button no less than once a month to verify proper operation of the visual and audible functions of the LIM.

Please contact your local Schneider Electric representative for more information.

Messages from the RS-485 Communication Bus

Alarm Messages

Alarm messages are created when one or more of the alarms become active. Depending on the type of device, these may be alarm values, a device's status, or an error message. These messages are controlled by the device in the system designated as the master. For details about error codes, see page 32.

Channel	Meaning
1	Total Hazard Current, in mA Bad ground connection Bad system connection
2	Transformer overload, in % Short circuit at CT connection Bad CT connection
3	Undervoltage between L1 and L2, in V Overvoltage between L1 and L2, in V
6	Impedance Z_F in k Ω
7	Resistance R_F in k Ω
9	Transformer over-temperature
10	Ground fault location in operation
11	Internal detected error

Operating Status Messages

Operating status messages contain general status information about the system. These messages are continuously generated and are interpreted by the system device designated as the master.

Channel	Meaning
1	Total Hazard Current, in mA
2	Transformer overload, in %
3	Voltage between L1 and L2, in V
4	Voltage between L1 and Ground, in V
5	Voltage between L2 and Ground, in V
6	Impedance Z_F in k Ω
7	Resistance R_F in k Ω
8	Leakage capacitance in nF

Technical Data

Table 5: Iso-Gard Series 6 LIM Technical Data

Item	Value	Factory Setting
Insulation Coordination According to IEC 60664-1/ UL1022		
Rated insulation voltage	250 V	
Rated impulse voltage / pollution degree	2.5 kV / III	
Voltage test according to IEC61010-1 and UL1022	2.0 kV	
Supply Voltage		
Supply voltage V_s	$= V_n$	
Power consumption	< 22 VA	
Isolated Power System Being Monitored		
Nominal voltage V_n	100–240 V	
Operating range of V_n	85–110%	
Rated frequency f_n	50/60 Hz	
Operating range of f_n	±5%	
Insulation and THC Monitoring		
Response value: THC	2 mA / 5 mA	5 mA
Response tolerance	1.8–2 mA / 4.5–5 mA	
Hysteresis	20%	
Response value Z	10–200 kΩ	off
Response tolerance	±15%	
Hysteresis	25%	
Response value R	20–200 kΩ	off
Response tolerance	±15%	
Hysteresis	25%	
Response time t_{an}	< 4 s	
Measuring Circuit		
Measuring voltage V_m	±48 V	
Measuring current I_m (at $Z_F = 0 \Omega$)	< 32 μA	
Internal resistance	≥ 1.5 MΩ	
Monitor Hazard Current MHC 120 V/240 V	60 μA / 95 μA	
EDS mode:		
Monitor Hazard Current MHC	< 950 μA	
Test cycle/idle time	2 s / 4 s	
Voltage Monitoring		
Response value undervoltage/ overvoltage (< U/> U)	80–300 V	off
Response tolerance	±3%	
Hysteresis	5%	
Load Current Monitoring ("C" option)		
Response value	10–200 A	off
Response tolerance	±5%	
Hysteresis	4%	
Temperature Monitoring		
Response value (permanently set)	4 kΩ	
Release value	1.6 kΩ	
PTC resistor according to DIN 44081	Maximum of six connected in series	
Adjustable Time Delays (do not apply to THC alarm)		
Response delay t_{on}	0–99 s	0 s
Delay on release t_{off}	0–99 s	0 s

Table 5: Iso-Gard Series 6 LIM Technical Data (continued)

Item	Value	Factory Setting				
Displays, Memory						
14-segment display	8 digits, multifunctional					
Measured value THC	0.0–9.9 mA					
Operating uncertainty	+7%, ±0.1 mA					
Measured value load current (as a percentage of the set response value)	10–199%					
Operating uncertainty	±5%, ±0.2 A					
Measured value mains voltages	10–300 V					
Operating uncertainty	±5%, ±2 V					
Measured value impedance Z	0–1000 kΩ					
Operating uncertainty	±5%, ±1 kΩ					
Measured value resistance R	2–1000 kΩ					
Operating uncertainty Z ~ R	±20%, ±1 kΩ					
Measured value leakage capacitance C	0–500 nF					
Operating uncertainty Z ~ X _C (at Z < 2 kΩ ==> no indication of R and C !)	±20%, ±5 nF					
Measured value load current	0.5A–250 A					
Operating uncertainty	±5%, ±0.2 A					
7-segment display	2 digits, digital THC indication					
Bar graph indicator	analog THC indication					
History memory	300 data records					
Data logger	300 data records					
Inputs/Outputs						
Operating uncertainty	±10%					
Output RI1, 12VDC COM	12 V / 200 mA					
RI2, SAFE, HAZARD, TEST	maximum of 4 x IG2000P					
Cable length	≤ 32.8 ft.					
Serial Interface						
Interface A-B / Protocol	RS-485 / proprietary bus					
Baud rate	9.6 kBit/s					
Cable length	≤ 3937 ft.					
Recommended cable (shielded, twisted pair, one end grounded)	J-Y(St)Y 2x0.8					
Terminating resistor	120 Ω (0,25 W) connectable via DIP switch	off				
Device address, communication bus	1–90	1				
Switching Elements						
Number	2 SPDT contacts					
Operating principle	Normally closed or open	Normally closed				
Electrical endurance	10,000 cycles					
Contact data according to IEC 60947-5-1:						
Relay 1:						
Utilization category	AC-13	AC-14	DC-12			
Rated operational voltage	230 V	230 V	24 V	110 V	120 V	
Rated operational current	5 A	3 A	1 A	0.2 A	0.1 A	
Minimum contact rating	1 mA at AC / DC ≥ 10 V					
Relay 2:						
Utilization category	DC-12					
Rated operational voltage	250 V	24 V	110 V	220 V		
Rated operational current	2 A	1.2 A	0.4 A	0.25 A		
Minimum contact rating	1 mA at AC / DC ≥ 10 V					

Table 5: Iso-Gard Series 6 LIM Technical Data (continued)

Item	Value	Factory Setting
Environment/EMC		
EMC	IEC 61326	
Operating temperature	+14 °F to +122 °F (-10 °C to +50 °C)	
Storing temperature	-13 °F to +158 °C (-25 °C to +70 °C)	
Climatic class according to IEC 60721		
Stationary use (IEC 60721-3-3)	3K5 (except condensation and formation of ice)	
Transport (IEC 60721-3-2)	2K3 (except condensation and formation of ice)	
Long-time storage (IEC 60721-3-1)	1K4 (except condensation and formation of ice)	
Classification of mechanical conditions according to IEC 60721		
Stationary use (IEC 60721-3-3)	3M4	
Transport (IEC 60721-3-2)	2M2	
Long-time storage (IEC 60721-3-1)	1M3	
Connection		
Connection type	Molex plug	
	15-pole, type 03-09-2159	
	12-pole, type 43045-1215	
General Data		
Operating mode	continuous operation	
Mounting position	display-oriented	
Degree of protection, internal components (EN 60529)	IP30 (NEMA 1)	
Enclosure material	polycarbonate	
Flammability class	UL94 V-0	
Type of enclosure	enclosure for panel mounting	
Panel hardware	four #4-40, oval head, black oxide finished	
Tightening torque	2.6–3.5 lb-in (0.3–0.4 N•m)	
Software version	D301 V1.0x	
Software version	D306 V1.0x	
Weight	≤ 1.21 lb.	

Table 6: Connector Plate Technical Data

Item	Value
Cable length	20 in.
Terminal strip	22 terminals
Connector	15 pin Molex and 12 pin Molex
Conductor size	22–12 AWG
Panel hardware	6-32 x 1/2 stainless steel, slotted, oval head, machine screw
Tightening torque	7.6–8.5 lb-in (0.86–0.96 N•m)
Mounting orientation	as desired
Weight	approximately 7 oz.

Detected Error Codes and Troubleshooting

Error Code	Meaning	Action	Result
ERROR 0.10	BAD CT CONNECTION CT interruption	Check the connection of the current transformer to the connector plate. NOTE: The STWL current transformer does not activate this alarm. Ensure proper connections if this device is being used.	The error code will automatically clear itself when the error is resolved.
ERROR 0.20	CT SHORT CURCUIT Short circuit CT	Check the current transformer for a possible short circuit.	The error code will automatically clear itself when the error is resolved.
ERROR 0.30	BAD GROUND CONNECTION LIM GND/GND2 monitoring	Ensure that both the LIMGND and GND2 connections are not interrupted.	The error code will automatically clear itself when the error is resolved.
ERROR 0.40	BAD SYSTEM CONNECTION Indicates the system voltage does not fall within the threshold required by the Iso-Gard Series 6 LIM, and that one of the following has occurred: the system voltage is less than 85 V or greater than 265 V, or the nominal frequency at 50 or 60 Hz is out of the tolerance range of $\pm 3\%$.	Ensure that L1 and L2 are properly connected to the system. Ensure that the voltage and frequency of the system being monitored fall within the limits of the Iso-Gard Series 6 LIM.	The error code will automatically clear itself when the error is resolved.
ERROR 2.10	NO MASTER No bus master exists. Even if RS-485 communication is not being used, the Iso-Gard Series 6 LIM must be assigned an address of 1.	If the Iso-Gard Series 6 LIM is connected to a bus network, ensure there is one approved device on the network set to address 1. If RS-485 communication is not being employed, set the Iso-Gard Series 6 LIM to address 1.	The error code will automatically clear itself when the error is resolved.
ERROR 2.20	RS-485 ERROR Bus error	Ensure that no two devices on the RS-485 network have the same bus address set. Check RS-485 wiring.	The error code will automatically clear itself when the error is resolved.
ERROR 8.80	BATTERY LOW The backup battery for the built-in clock is discharged.	Enter the main menu. Check the time and date settings, and reset them if required. The battery will then recharge during normal operation.	The error code will automatically clear itself when the error is resolved.
ERROR ...	All other error codes	Contact your local Schneider Electric representative.	

Ordering information

Product Type	Catalog No.	Description	Approval
Iso-Gard Series 6 LIM	IG6	100–240 V / 1-phase	UL Listed
Remote indicator	IG2000P	Mute + Test	UL Listed
	IGR	Mute + Test + Digital Metering	UL Listed
Connector plate	IG6C	LIM, CT, and digital remote	UL Recognized

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