TERASAKI
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NHP

TemBreak PRO

TemView *PRO*

External Display for P Model SMART Moulded Case Circuit Breakers

USER MANUAL

Version

1.1.0

Using this manual

Safety Precautions

Authorised Personnel Only
The product or system described in this documentation must be installed, operated and maintained by qualified personnel only. NHP or Terasaki accept no responsibility for the consequences of the use of this equipment by unqualified personnel.
A qualified person is one with the necessary skills and knowledge of the construction and operation of the installation of electrical equipment and has been trained to identify and avoid risks.

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The permissible ambient conditions must be met. The information contained in the technical documentation must be observed.

Publication of responsibility
The contents of this document have been reviewed to ensure that the reliability of the information is correct at time of publication.
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Warnings and notes
This documentation contains safety instructions that you must follow for your personal safety and to prevent damage to property.
Safety instructions, referring to your personal safety are reported in the literature by a safety alert symbol.

Safety warning symbols and the words below are classified according to the degree of risk.

WARNING: Indicates an imminently hazardous situation which, if it cannot be avoided, will result in death or serious injury.

WARNING: Indicates a potentially hazardous situation which, if it cannot be avoided, can result serious injury or death.

WARNING: Indicates a potentially hazardous situation which, if it cannot be avoided, may cause minor or moderate injury.

Notice: Indicates a warning of property damage and can also indicate important operating and especially useful information on the product, that it should pay particular attention to efficient and safe operation.

Summary of Changes

This section highlights the details of changes made since the previous issue of this document.

The versioning convention used to track changes in this document follows the structure V**x.y.z** where:

x: Major revision, where extensive changes are made which is generally incompatible with the previous version. Such changes may include new products and/or features, or removal of information which is no longer relevant or applicable to the previous version

y: Minor revision, where changes made do not change the overall scope of the previous version, but may include additional information which complements or corrects the previous version, or provides additional clarity on an existing topic.

z: Patch version, where small changes are made to correct minor errors or adjust existing text, charts, figures and/or images, and which do not add or remove information from the previous version. Example changes may include spelling corrections, image re-sizing and adjustments, updated images, etc.

Version	Publication date	Changes	By
V 1.0.0	19-Apr-2021	Initial release	D.NAT
V 1.1.0	In-Progress	Fixed typo on TPED part number, aligned Annex structure with another TBP User Manuals	N.ALEX

Table of Contents

Introduction

The TemView *PRO* (**TPED**) enables remote and expanded configuration of the NHP/Terasaki TemBreak *PRO* Smart Energy (**P_SE**) MCCBs. The TPED allows access to extended information including instantaneous and historic energy and power measurements, status indicators, and detailed trip and alarm history, as well as reading and writing of configuration and protection settings external to the MCCB via an easy-to-use interface outside the panel or switchboard.

This user manual describes the TPED features and instructions for use, and provides information for commissioning and configuring.

Who Should Use This Manual?

This manual aims to provide users, electricians, panel builders and maintenance personnel, with the technical information required for commissioning and operation of the NHP / Terasaki TPED.

Users of this document must have at minimum a basic understanding of the following:

- Power distribution and reticulation
- Circuit protection devices
- Fault currents
- Arc faults
- Temperature rise and thermal derating of switchgear

Additional Resources

The following resources contain additional information which should be read in conjunction with this document.

Resource	Description
NHP/Terasaki TemView *PRO* Installation Instructions TemView_PRO-IN-001-EN	Information on installing, mounting, and wiring the TemView *PRO* external display.
NHP/Terasaki TemBreak *PRO* P_SE Installation Instructions P160_3_SE-IN-001-EN P160_4_SE-IN-001-EN P250_3_SE-IN-001-EN P250_4_SE-IN-001-EN P400_3_SE-IN-001-EN P400_4_SE-IN-001-EN P630_3_SE-IN-001-EN P630_4_SE-IN-001-EN	Information on installing, mounting, and wiring the TemBreak *PRO* Smart Energy MCCB.
NHP/Terasaki TemBreak *PRO* P_SE MCCB User Manual P_SE-UM-001-EN	Reference guide for the TemBreak *PRO* Smart Energy MCCB including information for installation, wiring, commissioning, configuration, and troubleshooting.

Introduction

Terminology and Abbreviations

Abbreviation	Description	Abbreviation	Description
ACP	Auxiliary Communications port: Plug for Smart auxiliary / alarm contact block	**MCCB**	Moulded Case Circuit Breaker
AL	Alarm: An auxiliary contact indicating trip status	**microSD**	Micro Secure Digital
ASCII	American Standard Code for Information Interchange	**MIP**	Maintenance Interface Port: Plug for temporary connection to OCR testing, servicing, and maintenance tools
AX or AUX	Auxiliary: Auxiliary contact indicating open / closed	**N**	Neutral
BE	Basic Electronic Trip Unit (dial type, **LSI** and **LSIG**)	**NP**	Neutral Protection
CCW	Connected Components Workbench software	**OAC**	Optional Alarm Contact: Connection connector optional alarm output contact
CIP [1] [2]	[1] Communication Interface Port: Plug for control power and data for use with the TPED and TPCM [2] Common Industrial Protocol	**OCR**	Over Current Relay
CRC	Cyclic Redundancy Check – error-detecting code used at the end of each Modbus message	**P or PTA**	Pre-trip Alarm
dec	Decimal (base-10) numbering system	**PDU**	Protocol Data Unit
DINT	Signed Double Integer datatype (4 bytes or 32 bits in length)	**PELV**	Protected Extra Low Voltage (earthed system)
EIPM	TemBreak *PRO* Ethernet/IP Module	**PTA**	Pre-Trip Alarm: is a programmable output contact to advise when a trip may be imminent.
FF	Fixed Thermal and Fixed Magnetic	**RTU**	Remote Terminal Unit
FM	Fixed Thermal and Adjustable Magnetic	**S or STD**	Short Time Protection
G or GF	Ground Fault Protection	**SE**	Smart Energy Trip Unit
hex	Hexadecimal (base-16) numbering system	**SELV**	Separated Extra Low Voltage
I or INST	Instantaneous Protection	**SN**	Solid Neutral
IEC	International Electrotechnical Commission	**SSID**	Service Set Identifier (name of the Wi-Fi wireless network)
IEEE	Institute of Electrical and Electronics Engineers	**STR**	String datatype
I_g	Ground Fault Protection Current	**TCP**	Transmission Control Protocol
I_i	Instantaneous Protection Current	**TF**	Adjustable Thermal and Fixed Magnetic
I_n	Rated Current	**THD**	Total Harmonic Distortion
I_N	Neutral Protection Current	**TM**	Adjustable Thermal Magnetic
INT	Signed Integer datatype (2 bytes or 16 bits in length)	**TPCM**	TemCom *PRO* Communication Module
IP	International Protection (Ingress Protection)	**TPED**	TemView *PRO* External Display
I_r	Long Time Protection Current	t_r	Long Time Delay or Long Time Time
I_{sd}	Short Time Protection Current	t_{sd}	Short Time Delay or Short Time Time
I_{tsp}	Thermal Self Protection Current	t_{tsp}	Thermal Self Protection Time
L or LTD	Long Time Protection	**UDINT**	Unsigned Integer (2 bytes or 16-bits in length)
LCD	Liquid Crystal Display (LCD)	**UINT**	Unsigned Integer (2 bytes or 16 bits in length)
LED	Light Emitting Diode	**ULINT**	Unsigned Long Integer datatype (8 bytes or 64 bits in length)
LINT	Signed Long Integer datatype (8 bytes or 64 bits in length)	**URLs**	Uniform Resource Locator (address of an Internet website)
LSI	Long Time, Short Time and Instantaneous Protection	**WORD**	2 bytes or 16-bits of data
LSIG	Long Time, Short Time, Instantaneous and Ground Fault Protection	**ZSI**	Zone Selective Interlocking (zone selectivity)

Product Information

The TemView *PRO* (TPED) is an optional backlit LED external display which permits reading and writing data of the P_SE MCCB OCR, including protection settings, energy measurements, alarms, and event logs. It is used where direct access to the embedded display of the P_SE MCCB is not permitted, or otherwise enclosed and inaccessible.

The TPED easily mounts on a panel allowing for monitoring and configuration of the connected P_SE MCCB without requiring direct access to the MCCB or inside of the enclosure or panel. A CIP adapter cable is required to connect to the P_SE MCCB, and external 24Vdc supply is required to be feed either to an optional accompanying TemCom *PRO* communications module (TPCM) or with the use of the **TPPHQTT1_0H** cable for direct wiring of power supply.

The display is sealed to obtain an IP65 protection when installed in a suitable enclosure, such as a panel or switchboard. The LCD display is backlit for easy reading in low light conditions.

TPED Function	View	Modify
Protection Settings	✓	✓
Measurements	✓	–
Alarms	✓	✓
Configuration	✓	✓
Historical event log	✓	–
Circuit breaker identification data	✓	–

Part Numbers

TPED

Part Number	Description
TPED00N	External monitor and configurator for P_SE MCCBs

CIP-RJ9 cable

The physical connection between the TPED or TPCM and the P_SE MCCB is via the CIP adapter cable, which provides both the proprietary communications link and auxiliary power supply to the OCR.

The CIP adapter cable is comprised on one end a CIP connector which plugs into the CIP socket on the MCCB, and the other end either RJ9 plug for connection to the TPED or TPCM.

These are pre-wired adapters which are available in various lengths as required.

Connector	Part number reference	Compatible MCCB	Length
CIP	TPPHQTT330H – CIP to RJ9	P160 / P250	0.5 m
	TPPHQTT340H – CIP to RJ9	P160 / P250	1.5 m
	TPPHQTT350H – CIP to RJ9	P160 / P250	3 m
	TPPHQTT360H – CIP to RJ9	P160 / P250	5 m
	TPPHQTT370H – CIP to RJ9	P160 / P250	10 m
	TPPHQTT140H – CIP to free wire (un-terminated end for hardwired 24V dc to MCCB)	P160 / P250	1.2m
	TPPHQTT430H – CIP to RJ9	P400 / P630	0.5 m
	TPPHQTT440H – CIP to RJ9	P400 / P630	1.5 m
	TPPHQTT450H – CIP to RJ9	P400 / P630	3 m
	TPPHQTT460H – CIP to RJ9	P400 / P630	5 m
	TPPHQTT470H – CIP to RJ9	P400 / P630	10 m
	TPPHQTT160H – CIP to free wire (un-terminated end for hardwired 24V dc to MCCB)	P400 / P630	1.2m

Product Information

Product Data

Technical Data	
Dimensions	97 x 97 x 46 mm (27mm behind the door)
Door cut-out	92 x 92 mm
Screen size	37 x 78 mm
Viewing backlight	Backlit blue
Temperature operation	-10 ° C ... + 55 ° C
Pollution Category	III
Degree of protection	IP65 (rear is IP20)

Terminals/Plugs	Ratings	Notes
Power Supply	Voltage - 24 V DC (+/- 30%)	Supplied via CIP-RJ9 cable from P_SE MCCB
	Current – 85 mA	
Micro USB	—	For future firmware management.

Additional Certificates

Plugs & Ports

P_SE

The TemBreak *PRO* Smart Energy (P_SE) MCCB is equipped with specific connectors for connecting communication devices and accessories.
The Communication Input Port (**CIP)** are used to connect the TPCM to the MCCB, see below for their locations.

Port		Description
MIP		Maintenance Interface Port – for temporary connection to OCR testing, servicing, and maintenance tools. Located to the right of the embedded display front cover.
CIP		Communications Input Port – Multiple concurrent CIP connections are possible and are used to connect the TPED, an external 24V dc power supply and/or the TPCM as required. Located under the front cover.

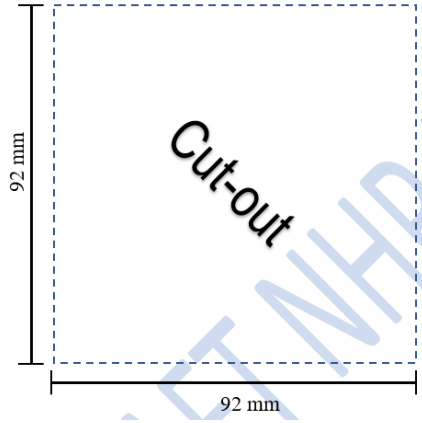
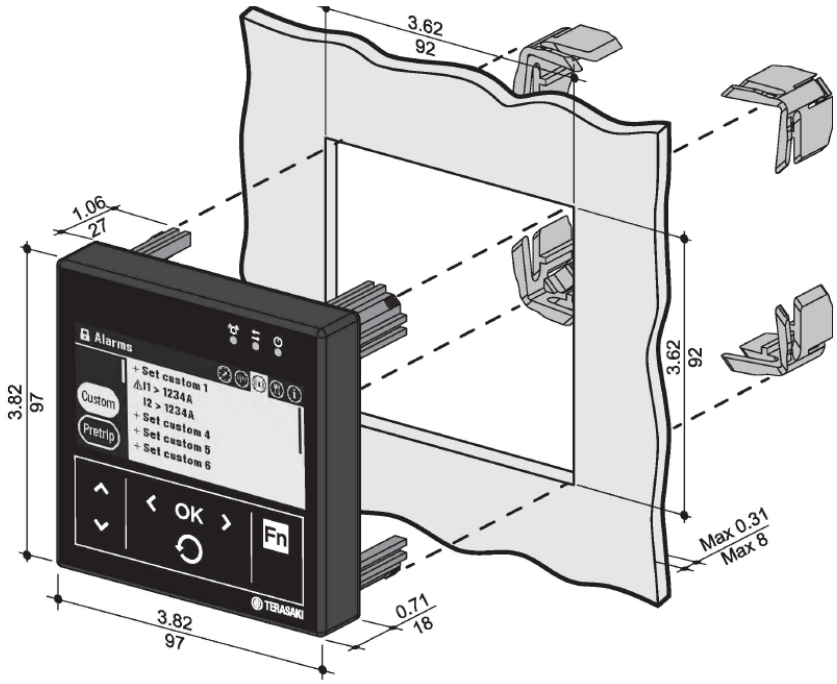
TPED

The TPED includes the following ports and connections.

Port		Description
RJ9		Connection port for TPPHQTT_ CIP adapter cable assembly for communication between a P_SE MCCB and TPED
Micro USB		For future firmware management.

Installation

Mechanical Installation

	Action	Note
1	Make a cutout in the required panel for the mounting of the TPED	
2	Insert the TPED into the cutout	
3	Use the supplied clips to hold the display in place.	
	Connect CIP adapter cable to TPED and P_SE MCCB.	Refer to ANNEX - Connection Diagram section.

Installation

Power Supply

An external 24 Vdc supply is required for the TPED, which is delivered via the CIP adapter cable to the P_SE MCCB. The MCCB in turn requires the external power supply connection, which is connected to the MCCB in one of two ways:

- Direct connection to MCCB with via CIP adapter cable TPPHQTT140H (P160 / P250), or TPPHQTT160H (P400 / P630)
- Connection via the TPCM provided power supply.

Notice: For power supply connection via the TPCM, refer to the TPCM Installation instructions and user manual

The external 24V dc power supply must be capable of delivering the necessary maximum current of the OCR and any connected accessories.

Trip unit / accessories	Current consumption @ 24V dc nominal
P_SE OCR	60 mA
TPED	85 mA
TPCM	40 mA

Installation

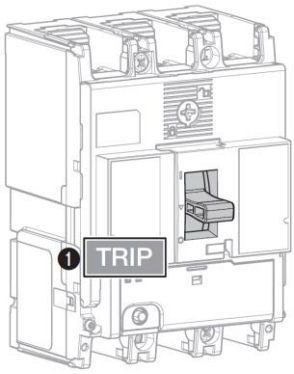
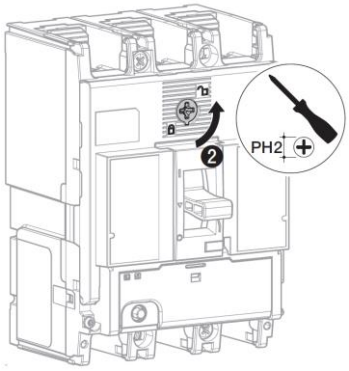
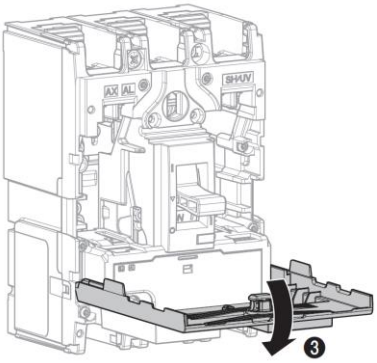
Power Supply

CIP adapter cable

Below are the steps for direct connection of power supply to the TPED via the OCR via CIP adapter cable:

- TPPHQTT140H (P160 / P250), or
- TPPHQTT160H (P400 / P630).

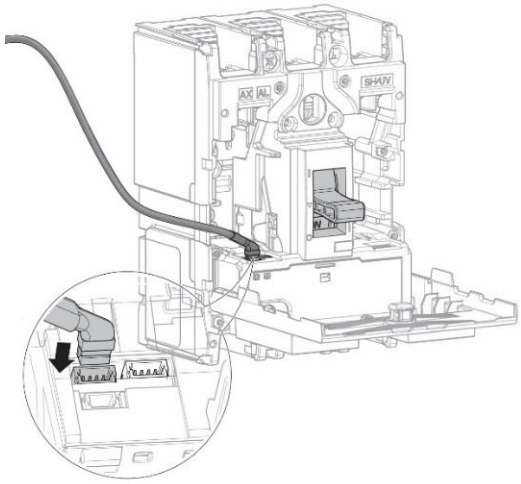
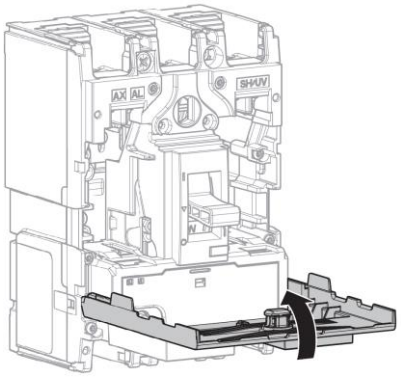
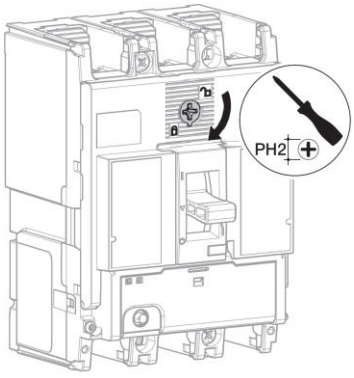
WARNING: Local wiring rules shall be respected (e.g., AS/NZS 3000: Wiring Rules) and shall provide:
- Separation of the power cables and ELV / communication cables
- Secure the cable along the routing.

	Action	Note / Illustration
1	Switch the MCCB to the OFF or TRIP position.	
2	Using a No.2 Phillips screwdriver, unlock the front cover by rotating the lock counter-clockwise	
3	Open the front cover of the MCCB	

Installation

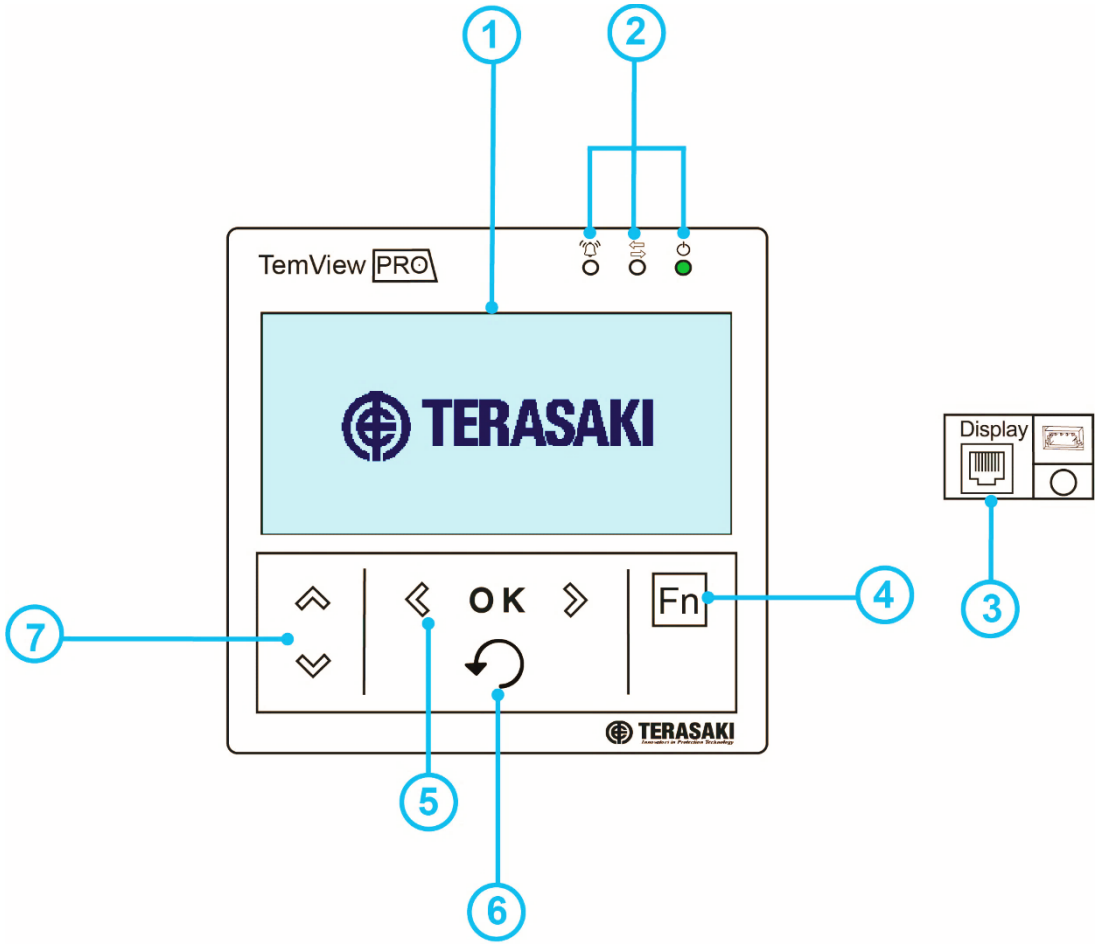
Power Supply

CIP adapter cable

	Action	Note / Illustration
4	Insert the CIP connector for the CIP adapter in one of the connectors marked CIP inside the circuit breaker on the left-hand side. Route the cable for the CIP adapter along the left-hand side cable channel of the circuit breaker provided for this purpose.	 Respect the direction of insertion for the connector: The adapter part marked CIP must be visible from the front. Avoid forcing the connector when inserting.
5	Close the front cover of the MCCB	
6	Using a No.2 Phillips screwdriver, lock the front cover by rotating the lock clockwise	
7	Terminate the other end of the CIP adapter cable to 24V dc power supply terminals.	Brown wire +24V dc White wire 0V dc

Navigation

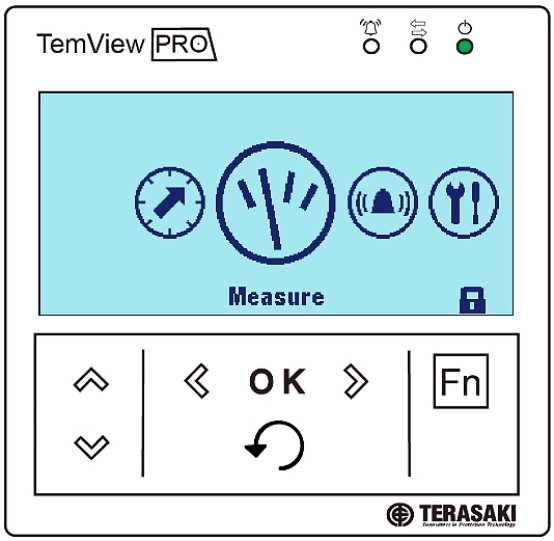
TPED Overview



	Component	Description
1	Screen	Backlit monochrome LCD
2	Signalling LED	Alarm – Communication - Ready
3	RJ9 port	At the rear of the display
4	Function “Fn” key	Function dependent on the menu displayed
5	Left / OK / Right keys	Left and Right keys to navigate to the left and right in the menus. OK key: Confirm an action.
6	Back key	Go back or exit menu. Return to Default Display by pressing and holding
7	Up / Down keys	Up and Down keys to navigate up and down the menus

Navigation Overview

Main Menu

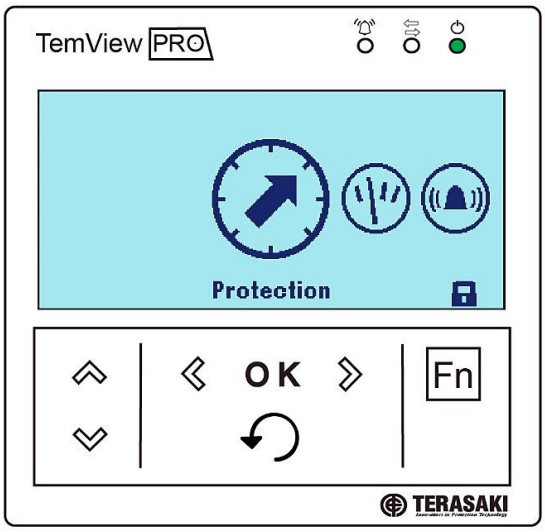


There are 5 main menus and a pop-up menu.

	Menu	Description
1		**Protection:** View and modify the LSI(G) protection settings.
2		**Measurement:** View the extended detailed real-time and historic measurements values
3		**Alarm:** View and modify alarms for various types of events based on system status and live monitoring of parameters, including custom alarms, PTA and Optional Alarm (OAC) contacts.
4		**Configuration:** View and modify MCCB measurement and display settings, and reset of historical measurement data, alarms and events.
5		**Information:** View the status and identification information of the MCCB and historic trip and alarm logs include SMART Auxiliary counters.
6		**Pop-up unlock menu:** Use the Function button to unlock.

Navigation Overview

Protection Settings



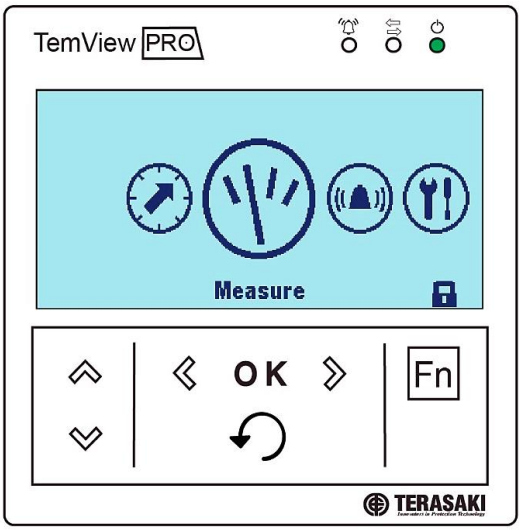
LSI(G) protection settings which are viewed and modified via the TPED are as follows:

Notice: Refer to the P_SE User Manual for further information on protection settings and particular detail on settings dependent on specific MCCB models and ratings.

	Menu	Description	Settings	Description
1	LSI	LSI Protection Settings	I_r	LTD – Long Time Delay protection threshold (current rating) **Setting Dependent on MCCB Ratings**
			t_r	LTD – Long Time Delay (time delay) **0.5 / 1.5 / 2.5 / 5 / 7.5 / 9 / 10 / 12 / 14 / 16**
			I_{sd}	STD – Short Time Delay protection threshold (current) **Setting Dependent on MCCB Ratings**
			t_{sd}	STD – Short Time Delay (time delay) **50 / 100 / 200 / 300 / 400 ms**
			I^2t	I^2t function for STD **OFF / ON**
			I_i	INST – Instantaneous protection threshold (current) **Setting Dependent on MCCB Ratings**
2		Thermal Memory / Hot-Cold start mode	—	The OCR models the heating and cooling of electrical conductors, which allows the MCCB to protect conductors against current overload considering the thermal state of these conductors. **OFF / ON**
3	N	Neutral Protection	—	Neutral protection uses the long-time delay, short time delay and instantaneous protection parameters. **50% / 100% / OFF**
4	Gnd	Ground Fault Protection	—	Ground Fault protection is protection against high strength insulation / earth faults. Ground fault is available with Electronic TemBreak *PRO* 3 and 4 pole MCCBs as standard. GF is independent time protection. **OFF / ON**
5	ZSI	Zone Interlocking	—	Zone Interlocking allows the MCCB to coordinate with upstream ACBs or MCCBs and downstream MCCBs to have the circuit breaker closest to the fault trip while the other circuit breakers wait for this circuit breaker to open circuit. **OFF / ON**

Navigation Overview

Measure



Detailed real-time and historic measurements which are viewed and assessable via the TPED are as follows.

Notice: Refer to the P_SE User Manual for further information on measurements including calculation and acquisition methods.

	Menu	Description	Measurements	Designator / Description
1	I	Current	Phase and neutral	I_1, I_2, I_3; I_N
			Arithmetic mean	$I_{avg} = [I_1 + I_2 + I_3] / 3$
			Maximum	I_{max} of I_1, I_2, I_3, I_N
			Minimum	I_{min} of I_1, I_2, I_3
			Ground / Earth	I_g
			Imbalance per phase	$I_{1\ Unb}$, $I_{2\ Unb}$, $I_{3\ Unb}$; $I_{N\ Unb}$ with respect to I_{avg}
			Maximum instantaneous Imbalance	$I_{max\ Unb}$ of $I_{1\ Unb}$, $I_{2\ Unb}$, $I_{3\ Unb}$, $I_{N\ Unb}$
			Maximum since last reset	Max. of each I_1, I_2, I_3; I_N, I_{max}, I_{min}, I_g
2	U	Voltage Phase to Phase	Phase-phase	U_{12}, U_{23}, U_{31}
			Arithmetic mean	$U_{avg} = [U_{12} + U_{23} + U_{31}] / 3$
			Maximum	U_{max} of U_{12}, U_{23}, U_{31}
			Instantaneous imbalance per phase	% U_{avg}
			Maximum imbalance	$U_{max\ Unb}$, $V_{max\ Unb}$
			Maximum since last reset	Max. of each U_{12}, U_{23}, U_{31}, U_{max}, U_{min}, U_{avg},
3	V	Voltage Phase to Neutral	Phase to neutral	V_{1N}, V_{2N}, V_{3N}
			Arithmetic mean	$V_{avg} = [V_{1N} + V_{2N} + V_{3N}] / 3$
			Instantaneous maximum	V_{max} of V_{1N}, V_{2N}, V_{3N}
			Imbalance per phase	% V_{avg}
			Maximum imbalance	$V_{max\ Unb}$
			Maximum since last reset	Max. of each V_{1N}, V_{2N}, V_{3N}, V_{max}, V_{min}, V_{avg}

Navigation Overview

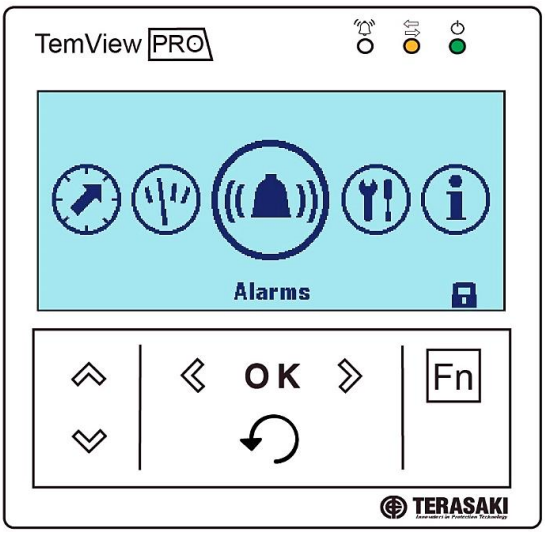
Measure

	Menu	Description	Measurements	Designator / Description
4	P	Power	Active	P1, P2, P3, Ptot
			Reactive	Q1, Q2, Q3, Qtot
			Apparent	S1, S2, S3, Stot
			Maximum since last reset	Max. of each P1, P2, P3, Ptot Max. of each Q1, Q2, Q3, Qtot Max. of each S1, S2, S3, Stot
5	D	Demand Power Maximums	Active, reactive, apparent power	$P_{1\ Dmd}$, $P_{2\ Dmd}$, $P_{3\ Dmd}$, $P_{tot\ Dmd}$ $Q_{1\ Dmd}$, $Q_{2\ Dmd}$, $Q_{3\ Dmd}$, $Q_{tot\ Dmd}$ $S_{1\ Dmd}$, $S_{2\ Dmd}$, $S_{3\ Dmd}$, $S_{tot\ Dmd}$
			Maximum power since the last reset	Max. of each $P_{1\ Dmd}$, $P_{2\ Dmd}$, $P_{3\ Dmd}$, $P_{tot\ Dmd}$ Max. of each $Q_{1\ Dmd}$, $Q_{2\ Dmd}$, $Q_{3\ Dmd}$, $Q_{tot\ Dmd}$ Max. of each $S_{1\ Dmd}$, $S_{2\ Dmd}$, $S_{3\ Dmd}$, $S_{tot\ Dmd}$
			Integration interval sliding, fixed, or synchronised by Modbus	Adjustable from 5 to 60 minutes in increments of one minute
6	PF	Power Factor	Power Factor	PF_1, PF_2, PF_3, PF_{tot}
			Displacement Power Factor	$Cos\varphi_1$, $Cos\varphi_2$, $Cos\varphi_3$, $Cos\varphi_{tot}$
7	THD	Total Harmonic Distortion	THD voltage	THD_{U12}, THD_{U23}, THD_{U31} THD_{V1N}, THD_{V2N}, THD_{V3N}
			THD current	THD_{I1}, THD_{I2}, THD_{I3}, THD_{Imax}
8	E	Energy	Consumed	$E_{a\ In}$, $E_{r\ In}$
			Produced	$E_{a\ Out}$, $E_{r\ Out}$
			Total apparent	E_s
9	F	Network	Frequency	f
			Quadrant	1^{st}, 2^{nd}, 3^{rd}, 4^{th}
			Phase rotation (sequence)	1-2-3, 1-3-2

Navigation Overview

Measure

Alarms

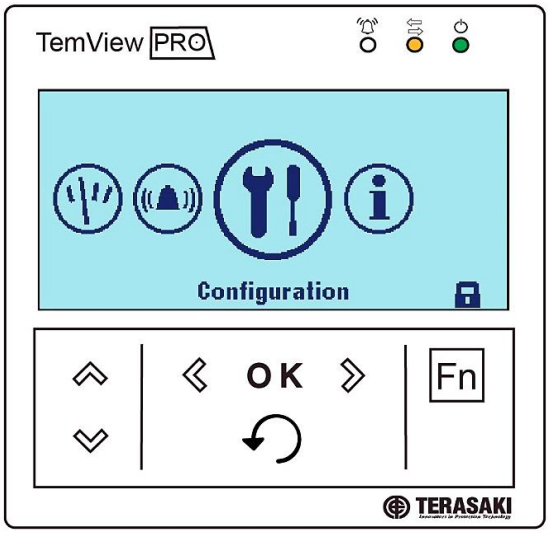


View and modify alarms for various types of events based on system status and live monitoring of parameters, including custom alarms, PTA and Optional Alarm (OAC) contacts.

	Menu	Description	Measurements	Designator / Description		
1	**Custom**	Custom Alarms	1-12 Custom Alarms	See Custom Alarms Section		
2	**PreTrip**	Pre-Trip Alarm Settings	Threshold	60 – 95 % (increments of 5%)		
			Delay	5 – 80 seconds (increments of 5s)		
3	**Trip**	Trip Priorities	Long Time	None / Low / Medium / High		
			Short Time	None / Low / Medium / High		
			Instantaneous	None / Low / Medium / High		
			Ground	None / Low / Medium / High		
			Trip Test	None / Low / Medium / High		
4	**OAC**	OAC Settings	Assignment	None	Custom Alarm 2	Custom Alarm 8
				Over Temperature	Custom Alarm 3	Custom Alarm 9
				External Neutral Unplugged	Custom Alarm 4	Custom Alarm 10
				Autotest Failure	Custom Alarm 5	Custom Alarm 11
				Pre-Trip Alarm I_r	Custom Alarm 6	Custom Alarm 12
				Custom Alarm 1	Custom Alarm 7	
			Reset Mode	Automatic / Latching		

Navigation Overview

Configuration



View and modify MCCB measurement and display settings, and reset of historical measurement data, alarms and events.

	Menu	Description	Measurements	Designator / Description
1		Display Settings	Brightness	20 / 40 / 60 / 80 / 100%
			Contrast	0 / 25 / 50 / 75 / 100%
			Display Mode	ON / OFF
			Language	English / Japanese / French / German / Italian / Spanish / Portuguese / Chinese
2		Date / Time	Date	DD / MM / YYYY
			Time	Adjustable Hours and Minutes Displays Hours / Minutes / Seconds
3		Password	Password Setting	4 Digit Code
4		Calculation Settings	Phase Sequence	1, 2, 3 / 1, 3, 2
			Topology	3-Pole-3-Wire / 3-Pole-4-Wire / 4-Pole-4-Wire
			P Sign Convention	Plus / Minus
			Calculation Convention	Arithmetic / Vector
			PF Sign Convention	IEEE / IEC
			On Demand Mode	Fixed / Sliding / Bus Sync
			On Demand Duration	5 – 60 minutes (increments of 1 min)

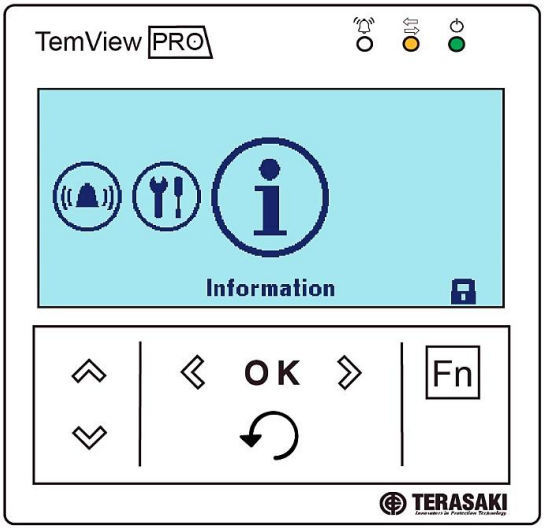
Navigation Overview

Configuration

	Menu	Description	Measurements	Designator / Description
5		Reset	Reset All Min / Max	Yes / No
			Reset Current Min / Max	
			Reset Voltage Min / Max	
			Reset Power Min / Max	
			Reset PF Min / Max	
			Reset Frequency Min / Max	
			Reset THD Min / Max	
			Reset On Demand Min / Max	
			Reset Energies Min / Max	
6		Erase Alarms	Erase All Alarm vents	Yes / No
			Erase Low Priority	
			Erase Medium Priority	
			Erase High Priority	
7		Erase Events	Erase All Trip Events	Yes / No
			Erase Low Priority	
			Erase Medium Priority	
			Erase High Priority	

Navigation Overview

Information



View the status and identification information of the MCCB and historic trip and alarm logs include SMART Auxiliary counters.

	Menu	Description	Description	Information
1		MCCB Information	Range Name	TemBreak PRO P(n)
			I_n	-
			Number of Poles	3 / 4
			Description 1	
			Description 2	
			Production Date	Week / Year
			MCCB Serial Number	
2		Contact Status	AUX Status	ON / OFF
			Alarm Status	ON / OFF
			AUX Counter	Number
			Alarm Counter	Number
			PTA Output	Active / OFF
			OAC Output	Active / OFF
			Operating Time of MCCB	Days
3		Alarm History	–	Past Alarms Listed
4		Trip Events	–	Trip Type DD / MM / YYYY – HH:MM
5		Display Serial Number	–	_ _ _ _ _ _ _ _ _TPED00NA

Alarms

Alarm Types

The TPED allows alarming from the P_SE OCR for various types of events based on system status and live monitoring of parameters. There are three types of alarms available on the TPED based on functionality and configurability.

- **System alarm**: Correspond to predefined events internal to the OCR.
- **Trip alarm**: Provide warning about trip events and guide diagnostics towards the cause of the trip.
- **Pre-Trip alarm (PTA):** Provides a warning about the imminent trip risk due to a current overload. It is associated with the PTA output contact.
- **Custom alarm:** Used to monitor and be alerted to the measurements taken by the SMART trip unit.

> **Notice**: PTA and System alarms are only visible on the TPED when assigned to the OAC, however, only one at a time is possible. Refer to OAC (Optional Alarm Contact) section.

Alarm Indication

Alarms are indicated on the TPED via an alarm LED, alarm pop-up, and/or alarm notification icon. The indication method is dependent on the alarm priority level, which may be factory assigned, or is user configurable.

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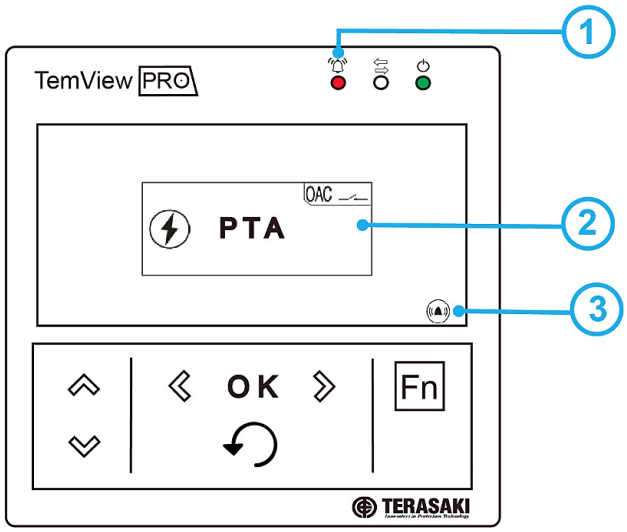
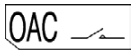


	Component
1	Alarm LED
2	Alarm pop-up
3	Alarm notification icon

Display	Description
	Trip alarm
	Custom alarm
	Appears when the active alarm has been assigned to the OAC output contact. Refer to OAC (Optional Alarm Contact) section and P_SE User Manual for more information.

Alarms

Priority Level

Each trip and custom alarm is associated with it a priority level, which determines how each alarm is displayed and logged.

Notice: Custom alarms are only visible using the TPED or TPCM, however, the P_SE OCR will still monitor and log any prior configured alarms without either TPED or TPCM connected.

Upon reconnection to a TPED or TPCM, the custom alarm trip history log will be populated and can be accessed.

The characteristics of each priority are provided in the below table:

Priority	Active alarm list	Alarm history log	TPED Alarm LED	TPED Alarm notification icon	TPED Alarm pop-up
None	✓	–	–	–	–
Low	✓	✓	–	–	–
Medium	✓	✓	✓	✓	–
High	✓	✓	✓	✓	✓

Priority None: Active alarms will not produce any notification, and will not be stored in the alarm history log of either TPED or TPCM. The respective alarm status will still display as active or inactive in the custom alarm configuration list of the TPED, and the Custom Alarms Status register of the TPCM.

Priority Low: Active alarms behave in the same way as Priority None alarms, but in addition will be logged in the alarm history log which is accessible on both TPED and TPCM. Both alarm activation and deactivation events will be logged (as applicable), complete with the details of the alarm type and event time.

Priority Medium: Active alarms behave in the same way as Priority Low alarms, but in addition will produce a notification on the TPED in the form of a flashing red alarm LED on the front, and an alarm notification icon on the lower right of the display. Pressing the “Fn” key under the alarm icon will open a pop-up display to view the details of active alarms and acknowledge deactivated alarms.

Priority High: Active alarms behave in the same way as Priority Medium alarms, but in addition will automatically produce a pop-up notification on the TPED without requiring the user the press the “Fn” key under the alarm icon.

Notice: PTA, System Alarms and OAC Alarm are always assigned Priority High and cannot be modified.

Clearing alarms

High priority alarm notifications must be cleared, which is done by pressing the “OK” key whilst the alarm notification is displayed.

	Action	Key
1	Clear the alarm - The notification disappears.	OK

Notice: After clearing, the alarm may still be active if the cause has not been eliminated. In this case, the alarm window may be visible on the list of active alarms.

Alarms

System Alarms

System alarms are produced as a result of at least one of the following pre-defined events, which are not user configurable:

- Internal OCR error
- OCR temperature alarm
- Disconnection of neutral

Notice: PTA and System alarms are only visible on the TPED when assigned to the OAC, however, only one at a time is possible. Refer to OAC (Optional Alarm Contact) section.

Internal OCR error: The P_SE OCR constantly monitors its protection function. In the event of an operating fault concerning the electronics of the OCR, the *Internal trip unit error* alarm is activated and the OCR Status LED flashes orange.

OCR Temperature: The P_SE OCR constantly monitors its internal temperature. In the event that the temperature exceeds 105°C, the *OCR temperature alarm* is activated and a pop-up appears on the P_SE embedded display and TPED where used. The alarm features a lower hysteresis threshold, which keeps the alarm active until the internal temperature of the OCR drops below 100°C.

Disconnection of Neutral: Only available on MCCB's with Neutral reference (3Ph+N). This alarm is activated if the neutral pole is disconnected and if this alarm has been assigned to the OAC output contact. A disconnected neutral in the network supply may produce a dangerous increase in Phase-Neutral voltage in unbalanced 3-phase systems. This sustained overvoltage can result in damage to equipment and insulation and poses a safety risk to personnel. Neutral disconnection detection is based on monitoring a threshold Ph-N overvoltage of approximately 275 Vac with a time delay as defined by standard EN 50550 for a rated Ph-N voltage of 230 V.

Trip Alarms

The trip alarms indicate a trip type and provide information about the trip event values.
The possible trips alarms are:

- Trip related to LTD protection
- Trip related to STD protection
- Trip related to INST protection
- Trip related to GF protection
- Trip related to OCR testing, servicing, and maintenance tools

The following information is provided in the case of the message for a trip alarm:

- Trip cause
- Phase concerned by the fault (only for LTD, STD and INST related trips)
- Fault current value (only LTD, STD, INST and GF)

Alarms

PTA (Pre-Trip Alarm)

The Pre-Trip Alarm permits monitoring and early warning of overload conditions prior to an actual LTD trip. The PTA setting is defined by two parameters which define the Pre-trip warning and Pre-trip Alarm zones and thus the behaviour of the PTA contact and status LED on the P_SE MCCB:

- PTA current threshold I_p: Threshold expressed as a percentage of I_r and is adjustable from 60…95%
- PTA time delay t_p : Expressed as a percentage of t_r and is adjustable from 5…80%

The I_p current threshold defines the lowest current that could be considered to be within the Pre-trip warning and Pre-trip alarm zones. The t_p time delay threshold defines the shortest time in which the Pre-trip alarm will activate. The time delay for PTA follows the LTD protection curve and varies with current as shown in the figure below. Lower currents in the Pre-trip zones will activate the alarm with a longer delay than higher currents.

The behaviour of the various pre-trip zones is illustrated in the figure and table below.

If the load current is less than the I_p current threshold, then this is considered the normal load zone, and the PTA LED and contact are unaffected and remain OFF and OPEN, respectively.

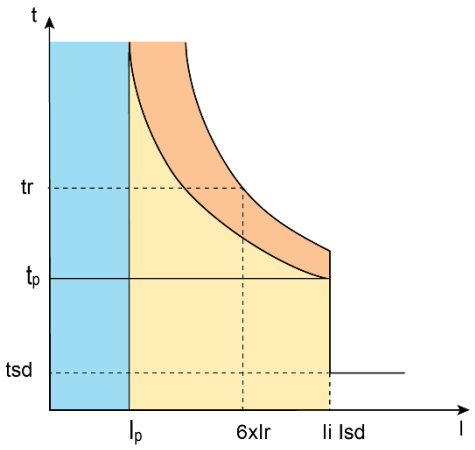
As the load current increases to at or above I_p, the Pre-trip warning zone is entered, and is indicated by the PTA LED illuminating FLASHING orange. Whilst in the pre-trip warning zone, the load current is monitored and characterised with thermal imaging by the OCR.

If the current remains above I_p for an extended period of time, the Pre-trip Alarm zone is entered, and is indicated by the PTA LED illuminating SOLID orange, and the PTA contact activating CLOSED. The time required for the Pre-trip Alarm to activate is dependent on the current value and the t_p parameter set, as this follows the LTD protection curve.

Notice: The use of the PTA contact requires the connection of the OAC/PTA cable to the PTA port located on the external left-hand side of the P_SE MCCB. Refer to the P_SE User manual for details on the OAC/PTA cable.

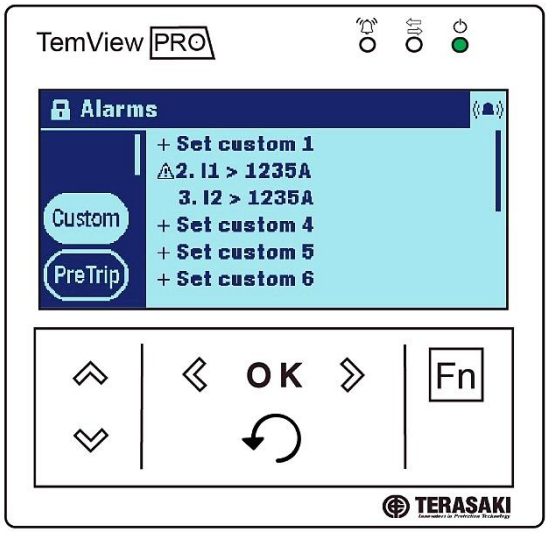
Notice: PTA and System alarms are only visible on the TPED when assigned to the OAC, however, only one at a time is possible. Refer to OAC (Optional Alarm Contact) section.

Pre-trip zone	Current I vs. I_p	P_SE PTA LED status	P_SE PTA Contact status
Normal load	$I < I_p$	OFF READY	OPEN
Pre-trip Warning	$I \geq I_p$	FLASHING READY	OPEN
Pre-trip Alarm	$I \geq I_p$	SOLID READY	CLOSED



Alarms

Custom Alarms



Custom alarms make it possible to produce alarms based specific events and measurements made by the P_SE OCR. They are only available to be configured and displayed using the TPED and/or TPCM in conjunction with the P_SE MCCB.

Up to 12 custom alarms may be individually configured for a single P_SE OCR, with each used to monitor a single event of measurement.

Custom alarms may also be assigned to the OAC (Optional Alarm Contact) to provide a physical output when the respective custom alarm has been activated. Refer to OAC (Optional Alarm Contact) section for more information.

Notice: Only one alarm may be assigned to the OAC at any one time. This includes only one of PTA, System or Custom alarms. Refer to OAC (Optional Alarm Contact) section.

A custom alarm is defined through the following parameters:

- Measurement monitored
- Activation threshold
- Deactivation threshold
- Activation time delay
- Deactivation time delay
- Priority level

Custom alarm parameters

Configuration of custom alarm types, pick-up and drop-out thresholds and time delays can be made using the TPED and are configured to activate under specific conditions, which, depending on the event or measurement type may include one or more of the following parameters:

- Pick-up threshold
- Pick-up time delay
- Drop-out threshold
- Drop-out time delay
- Equivalent value

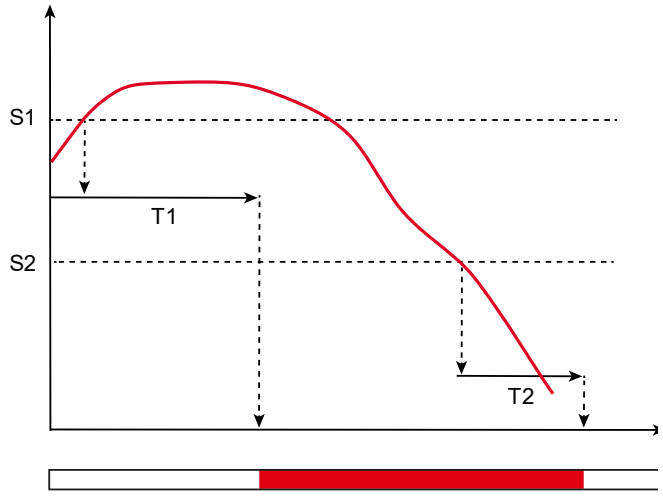
The pick-up threshold in conjunction with its time delay determine the value in which the custom alarm is activated, whereas the drop-out threshold is the value which de-activates the alarm. One may be set to a value higher or lower than the other, which determines whether the alarm activation is positive or negative with respect to the change in the measurement value.

Alarms

Custom Alarms

Positive activation

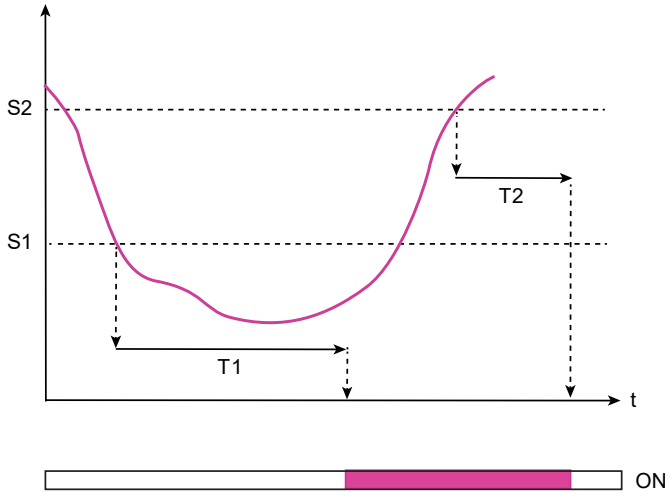
In the case of a positive activation, the alarm is activated when the monitored value increases towards the pick-up threshold. This occurs when the pick-up threshold is set to a higher value than the drop-out threshold.



Symbol	Description
S1	Pick-up threshold
S2	Drop-out threshold
T1	Pick-up time delay
T2	Drop-out time delay

Negative activation

In the case of a negative activation, the alarm is activated when the monitored value decreases towards the pick-up threshold. This occurs when the pick-up threshold is set to a lower value than the drop-out threshold.



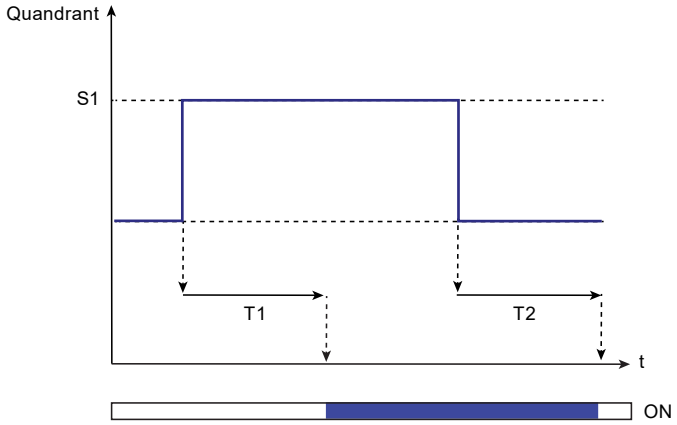
Symbol	Description
S1	Pick-up threshold
S2	Drop-out threshold
T1	Pick-up time delay
T2	Drop-out time delay

Alarms

Custom Alarms

Equivalent value activation

For the equal value activation, the alarm is activated when the value measured is equal to the configured value. The activation threshold is the same as the activation value.



Symbol	Description
S1	Pick-up value
T1	Pick-up time delay
T2	Drop-out time delay

Alarms

Custom Alarms

Time delays

Custom alarms are activated once the pick-up threshold has been reached and the configured pick-up time delay has elapsed. Likewise, custom alarms are deactivated after the drop-out threshold is reached and the drop-out time delay has elapsed. Both pick-up and drop-out time delays are independently configurable, from a minimum 1 second to maximum 3000 seconds.

The time delays are provided as cumulative counters based on the time elapsed, which increments as the measured value reaches or exceeds the threshold value, and decrements if the measured value drops below the threshold value. Activation and deactivation of the respective custom alarm requires the time-delay counter to reach the configured time delay.

Pick-up time delay: For the activation of a custom alarm, the pick-up time delay counter:

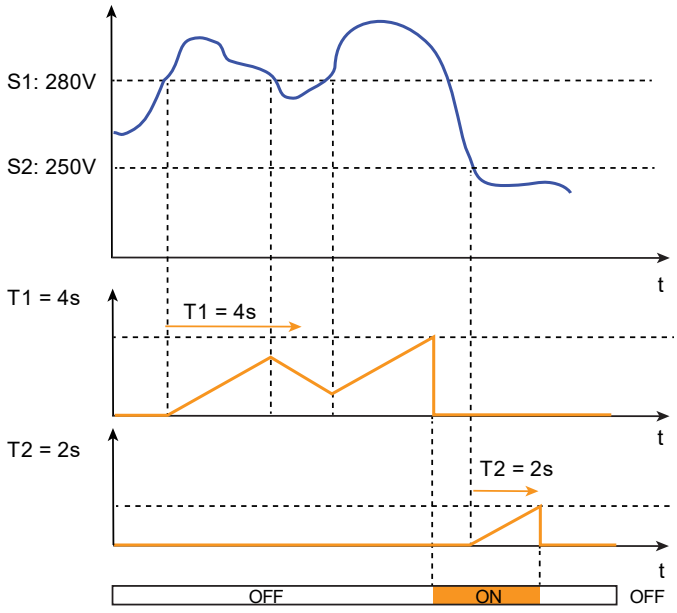
- Increases by 1 per second when the pick-up threshold value is met or exceeded.
- Decreases by 1 per second if the pick-up threshold value is not met and the cumulative elapsed time is not reached.
- Resets to 0 when the cumulative time delay is reached and custom alarm is activated.

Drop-out time delay: For the deactivation of a custom alarm, the drop-out time delay counter:

- Increases by 1 per second when the drop-out threshold value is met or exceeded.
- Decreases by 1 per second if the drop-out threshold value is not met and the cumulative elapsed time is not reached.
- Resets to 0 when the cumulative time delay is reached and custom alarm is activated.

If an alarm is reconfigured using the TPED or TPCM whilst a custom alarm time delay counter has begun, the counters are reset to 0.

Example: A custom alarm is set to a positive activation pick-up threshold of 280 V for an overvoltage measurement of V1N. The pick-up time delay is set to 4 seconds. The drop-out threshold value is set at 250 V and the drop-out time delay at 2 seconds.



Symbol	Meaning
S1	Pick-up threshold
S2	Dop-out threshold
T1	Pick-up time delay
T2	Drop-out time delay

Alarms

Custom Alarms

Custom alarms list

ID	Name	Pick-up or Drop-out threshold value				Pick-up or Drop-out time delay value				3Ph	3Ph+N
		Unit	Res	Min. value	Max. value	Unit	Res	Min. value	Max. value		
0	No assignment	—	—	—	—	—	—	—	—	✓	✓
1	Over Instantaneous Current [I_1]	A	0.1	8	6300	sec	1	1	3000	✓	✓
2	Over Instantaneous Current [I_2]	A	0.1	8	6300	sec	1	1	3000	✓	✓
3	Over Instantaneous Current [I_3]	A	0.1	8	6300	sec	1	1	3000	✓	✓
4	Over Instantaneous Current [I_N] (*4P MCCB Only)	A	0.1	8	6300	sec	1	1	3000	—	✓*
5	Over Instantaneous Current [I_{max}]	A	0.1	8	6300	sec	1	1	3000	✓	✓
6	Under Instantaneous Current [I_1]	A	0.1	8	6300	sec	1	1	3000	✓	✓
7	Under Instantaneous Current [I_2]	A	0.1	8	6300	sec	1	1	3000	✓	✓
8	Under Instantaneous Current [I_3]	A	0.1	8	6300	sec	1	1	3000	✓	✓
9	Under Instantaneous Current [I_N] (*4P MCCB Only)	A	0.1	8	6300	sec	1	1	3000	—	✓*
10	Ground Current	x I_g	0.01	0.1	1	sec	1	1	3000	✓	✓
11	Over Unbalance Current [I_1]	x I_{avg}	0.1%	5%	60%	sec	1	1	3000	✓	✓
12	Over Unbalance Current [I_2]	x I_{avg}	0.1%	5%	60%	sec	1	1	3000	✓	✓
13	Over Unbalance Current [I_3]	x I_{avg}	0.1%	5%	60%	sec	1	1	3000	✓	✓
14	Over Unbalance Current [$I_{max\ Unb}$]	x I_{avg}	0.1%	5%	60%	sec	1	1	3000	✓	✓
15	Over Average Current [I_{avg}]	A	0.1	8	6300	sec	1	1	3000	✓	✓
16	Under Average Current [I_{avg}]	A	0.1	8	6300	sec	1	1	3000	✓	✓
17	Over Instantaneous Voltage [V_{1N}]	V	0.1	80	800	sec	1	1	3000	—	✓
18	Over Instantaneous Voltage [V_{2N}]	V	0.1	80	800	sec	1	1	3000	—	✓
19	Over Instantaneous Voltage [V_{3N}]	V	0.1	80	800	sec	1	1	3000	—	✓
20	Over Instantaneous Voltage [V_{max}]	V	0.1	80	800	sec	1	1	3000	—	✓
21	Under Instantaneous Voltage [V_{1N}]	V	0.1	80	800	sec	1	1	3000	—	✓
22	Under Instantaneous Voltage [V_{2N}]	V	0.1	80	800	sec	1	1	3000	—	✓
23	Under Instantaneous Voltage [V_{3N}]	V	0.1	80	800	sec	1	1	3000	—	✓
24	Under Instantaneous Voltage [V_{min}]	V	0.1	80	800	sec	1	1	3000	—	✓
25	Over Unbalance Voltage [V_{1N}]	x V_{avg}	0.1%	2%	30%	sec	1	1	3000	—	✓
26	Over Unbalance Voltage [V_{2N}]	x V_{avg}	0.1%	2%	30%	sec	1	1	3000	—	✓
27	Over Unbalance Voltage [V_{3N}]	x V_{avg}	0.1%	2%	30%	sec	1	1	3000	—	✓
28	Over Unbalance Voltage [$V_{max\ Unb}$]	x V_{avg}	0.1%	2%	30%	sec	1	1	3000	—	✓
29	Over Average Voltage [V_{avg}]	V	0.1	80	800	sec	1	1	3000	—	✓
30	Under Average Voltage [V_{avg}]	V	0.1	80	800	sec	1	1	3000	—	✓
31	Over Instantaneous Voltage [U_{12}]	V	0.1	80	800	sec	1	1	3000	✓	✓
32	Over Instantaneous Voltage [U_{23}]	V	0.1	80	800	sec	1	1	3000	✓	✓
33	Over Instantaneous Voltage [U_{31}]	V	0.1	80	800	sec	1	1	3000	✓	✓
34	Over Instantaneous Voltage [U_{max}]	V	0.1	80	800	sec	1	1	3000	✓	✓
35	Under Instantaneous Voltage [U_{12}]	V	0.1	80	800	sec	1	1	3000	✓	✓
36	Under Instantaneous Voltage [U_{23}]	V	0.1	80	800	sec	1	1	3000	✓	✓
37	Under Instantaneous Voltage [U_{31}]	V	0.1	80	800	sec	1	1	3000	✓	✓
38	Under Instantaneous Voltage [U_{min}]	V	0.1	80	800	sec	1	1	3000	✓	✓
39	Over Unbalance Voltage [U_{12}]	x U_{avg}	0.1%	2%	30%	sec	1	1	3000	✓	✓
40	Over Unbalance Voltage [U_{23}]	x U_{avg}	0.1%	2%	30%	sec	1	1	3000	✓	✓
41	Over Unbalance Voltage [U_{31}]	x U_{avg}	0.1%	2%	30%	sec	1	1	3000	✓	✓
42	Over Unbalance Voltage [$U_{max\ Unb}$]	x U_{avg}	0.1%	2%	30%	sec	1	1	3000	✓	✓

Alarms

Custom Alarms

Custom alarms List

ID	Name	Pick-up or Drop-out threshold value				Pick-up or Drop-out time delay value				3Ph	3Ph+N
		Unit	Res	Min. value	Max. value	Unit	Res	Min. value	Max. value		
43	Over Direct Active power [P_1]	kW	0.1	1	1000	sec	1	1	3000	—	✓
44	Over Direct Active power [P_2]	kW	0.1	1	1000	sec	1	1	3000	—	✓
45	Over Direct Active power [P_3]	kW	0.1	1	1000	sec	1	1	3000	—	✓
46	Over Direct Active power [P_{tot}]	kW	0.1	1	3000	sec	1	1	3000	✓	✓
47	Under Direct Active power [P_1]	kW	0.1	1	1000	sec	1	1	3000	—	✓
48	Under Direct Active power [P_2]	kW	0.1	1	1000	sec	1	1	3000	—	✓
49	Under Direct Active power [P_3]	kW	0.1	1	1000	sec	1	1	3000	—	✓
50	Under Direct Active power [P_{tot}]	kW	0.1	1	3000	sec	1	1	3000	✓	✓
51	Over Return Active power [P_1]	kW	0.1	1	1000	sec	1	1	3000	—	✓
52	Over Return Active power [P_2]	kW	0.1	1	1000	sec	1	1	3000	—	✓
53	Over Return Active power [P_3]	kW	0.1	1	1000	sec	1	1	3000	—	✓
54	Over Return Active power [P_{tot}]	kW	0.1	1	3000	sec	1	1	3000	✓	✓
55	Under Return Active power [P_1]	kW	0.1	1	1000	sec	1	1	3000	—	✓
56	Under Return Active power [P_2]	kW	0.1	1	1000	sec	1	1	3000	—	✓
57	Under Return Active power [P_3]	kW	0.1	1	1000	sec	1	1	3000	—	✓
58	Under Return Active power [P_{tot}]	kW	0.1	1	3000	sec	1	1	3000	✓	✓
59	Over Direct Reactive power [Q_1]	kVAr	0.1	1	1000	sec	1	1	3000	—	✓
60	Over Direct Reactive power [Q_2]	kVAr	0.1	1	1000	sec	1	1	3000	—	✓
61	Over Direct Reactive power [Q_3]	kVAr	0.1	1	1000	sec	1	1	3000	—	✓
62	Over Direct Reactive power [Q_{tot}]	kVAr	0.1	1	3000	sec	1	1	3000	✓	✓
63	Under Direct Reactive power [Q_1]	kVAr	0.1	1	1000	sec	1	1	3000	—	✓
64	Under Direct Reactive power [Q_2]	kVAr	0.1	1	1000	sec	1	1	3000	—	✓
65	Under Direct Reactive power [Q_3]	kVAr	0.1	1	1000	sec	1	1	3000	—	✓
66	Under Direct Reactive power [Q_{tot}]	kVAr	0.1	1	3000	sec	1	1	3000	✓	✓
67	Over Return Reactive power [Q_1]	kVAr	0.1	1	1000	sec	1	1	3000	—	✓
68	Over Return Reactive power [Q_2]	kVAr	0.1	1	1000	sec	1	1	3000	—	✓
69	Over Return Reactive power [Q_3]	kVAr	0.1	1	1000	sec	1	1	3000	—	✓
70	Over Return Reactive power [Q_{tot}]	kVAr	0.1	1	3000	sec	1	1	3000	✓	✓
71	Under Return Reactive power [Q_1]	kVAr	0.1	1	1000	sec	1	1	3000	—	✓
72	Under Return Reactive power [Q_2]	kVAr	0.1	1	1000	sec	1	1	3000	—	✓
73	Under Return Reactive power [Q_3]	kVAr	0.1	1	1000	sec	1	1	3000	—	✓
74	Under Return Reactive power [Q_{tot}]	kVAr	0.1	1	3000	sec	1	1	3000	✓	✓
75	Over Apparent power [S_1]	kVA	0.1	1	1000	sec	1	1	3000	—	✓
76	Over Apparent power [S_2]	kVA	0.1	1	1000	sec	1	1	3000	—	✓
77	Over Apparent power [S_3]	kVA	0.1	1	1000	sec	1	1	3000	—	✓
78	Over Apparent power [S_{tot}]	kVA	0.1	1	3000	sec	1	1	3000	✓	✓
79	Under Apparent power [S_1]	kVA	0.1	1	1000	sec	1	1	3000	—	✓
80	Under Apparent power [S_2]	kVA	0.1	1	1000	sec	1	1	3000	—	✓
81	Under Apparent power [S_3]	kVA	0.1	1	1000	sec	1	1	3000	—	✓
82	Under Apparent power [S_{tot}]	kVA	0.1	1	3000	sec	1	1	3000	✓	✓
83	Lagging power factor [PF_1]	—	0.01	0	0.99	sec	1	1	3000	—	✓
84	Lagging power factor [PF_2]	—	0.01	0	0.99	sec	1	1	3000	—	✓
85	Lagging power factor [PF_3]	—	0.01	0	0.99	sec	1	1	3000	—	✓
86	Lagging power factor [PF_{tot}]	—	0.01	0	0.99	sec	1	1	3000	✓	✓
87	Leading displacement PF [$Cos\varphi_1$]	—	0.01	0	0.99	sec	1	1	3000	—	✓
88	Leading displacement PF [$Cos\varphi_2$]	—	0.01	0	0.99	sec	1	1	3000	—	✓
89	Leading displacement PF [$Cos\varphi_3$]	—	0.01	0	0.99	sec	1	1	3000	—	✓
90	Leading displacement PF [$Cos\varphi_{tot}$]	—	0.01	0	0.99	sec	1	1	3000	✓	✓
91	Lagging displacement PF [$Cos\varphi_1$]	—	0.01	0	0.99	sec	1	1	3000	—	✓

Alarms

Custom Alarms

Custom alarms List

ID	Name	Pick-up or Drop-out threshold value				Pick-up or Drop-out time delay value				3Ph	3Ph+N
		Unit	Res	Min. value	Max. value	Unit	Res	Min. value	Max. value		
92	Lagging displacement PF [Cosφ_2]	—	0.01	0	0.99	sec	1	1	3000	—	✓
93	Lagging displacement PF [Cosφ_3]	—	0.01	0	0.99	sec	1	1	3000	—	✓
94	Lagging displacement PF [Cosφ_{tot}]	—	0.01	0	0.99	sec	1	1	3000	✓	✓
95	Over THD Current [THDI$_1$]	—	0.1%	0%	1000%	sec	1	1	3000	✓	✓
96	Over THD Current [THDI$_2$]	—	0.1%	0%	1000%	sec	1	1	3000	✓	✓
97	Over THD Current [THDI$_3$]	—	0.1%	0%	1000%	sec	1	1	3000	✓	✓
98	Over THD Voltage [THDV$_{1N}$]	—	0.1%	0%	1000%	sec	1	1	3000	—	✓
99	Over THD Voltage [THDV$_{2N}$]	—	0.1%	0%	1000%	sec	1	1	3000	—	✓
100	Over THD Voltage [THDV$_{3N}$]	—	0.1%	0%	1000%	sec	1	1	3000	—	✓
101	Over THD Voltage [THDU$_{12}$]	—	0.1%	0%	1000%	sec	1	1	3000	✓	✓
102	Over THD Voltage [THDU$_{23}$]	—	0.1%	0%	1000%	sec	1	1	3000	✓	✓
103	Over THD Voltage [THDU$_{31}$]	—	0.1%	0%	1000%	sec	1	1	3000	✓	✓
104	Over frequency [F]	Hz	0.01	45	65	sec	1	1	3000	✓	✓
105	Under frequency [F]	Hz	0.01	45	65	sec	1	1	3000	✓	✓
106	Over Current demand [I$_{1\ Dmd}$]	A	0.1	8	6300	sec	1	1	3000	✓	✓
107	Over Current demand [I$_{2\ Dmd}$]	A	0.1	8	6300	sec	1	1	3000	✓	✓
108	Over Current demand [I$_{3\ Dmd}$]	A	0.1	8	6300	sec	1	1	3000	✓	✓
109	Over Current demand [I$_{N\ Dmd}$] (*4P MCCB Only)	A	0.1	8	6300	sec	1	1	3000	—	✓*
110	Over Current demand [I$_{avg\ Dmd}$]	A	0.1	8	6300	sec	1	1	3000	✓	✓
111	Under Current demand [I$_{1\ Dmd}$]	A	0.1	8	6300	sec	1	1	3000	✓	✓
112	Under Current demand [I$_{2\ Dmd}$]	A	0.1	8	6300	sec	1	1	3000	✓	✓
113	Under Current demand [I$_{3\ Dmd}$]	A	0.1	8	6300	sec	1	1	3000	✓	✓
114	Under Current demand [I$_{N\ Dmd}$] (*4P MCCB Only)	A	0.1	8	6300	sec	1	1	3000	—	✓*
115	Under Current demand [I$_{avg\ Dmd}$]	A	0.1	8	6300	sec	1	1	3000	✓	✓
116	Over Active power demand [P$_{tot\ Dmd}$]	kW	0.1	1	3000	sec	1	1	3000	✓	✓
117	Under Active power demand [P$_{tot\ Dmd}$]	kW	0.1	1	3000	sec	1	1	3000	✓	✓
118	Over Reactive power demand [Q$_{tot\ Dmd}$]	kVAr	0.1	1	3000	sec	1	1	3000	✓	✓
119	Under Reactive power demand [Q$_{tot\ Dmd}$]	kVAr	0.1	1	3000	sec	1	1	3000	✓	✓
120	Over apparent power demand [S$_{tot\ Dmd}$]	kVA	0.1	1	3000	sec	1	1	3000	✓	✓
121	Under apparent power demand [S$_{tot\ Dmd}$]	kVA	0.1	1	3000	sec	1	1	3000	✓	✓
122	Operating quadrant 1 (P>0, Q>0)	—	—	1	1	sec	1	1	3000	✓	✓
123	Operating quadrant 2 (P<0, Q>0)	—	—	2	2	sec	1	1	3000	✓	✓
124	Operating quadrant 3 (P<0, Q<0)	—	—	3	3	sec	1	1	3000	✓	✓
125	Operating quadrant 4 (P>0, Q<0)	—	—	4	4	sec	1	1	3000	✓	✓
126	Phase sequence 1->2->3	—	—	0	0	sec	1	1	3000	✓	✓
127	Phase sequence 1->3->2	—	—	1	1	sec	1	1	3000	✓	✓
128	Operating quadrant 2 or 4 (Capacitive)	—	—	0	0	sec	1	1	3000	✓	✓
129	Operating quadrant 1 or 3 (Inductive)	—	—	1	1	sec	1	1	3000	✓	✓
130	Leading Power factor PF1	—	0.01	0	0.99	sec	1	1	3000	—	✓
131	Leading Power factor PF2	—	0.01	0	0.99	sec	1	1	3000	—	✓
132	Leading Power factor PF3	—	0.01	0	0.99	sec	1	1	3000	—	✓
133	Leading Power factor PFtot	—	0.01	0	0.99	sec	1	1	3000	✓	✓

Alarms

OAC (Optional Alarm Contact)

The OAC is an optional alarm which can be assigned with one of several types of alarms. When the assigned alarm is activated, the alarm will display on the TPED as a pop-up notification. The OAC also has a physical contact on the P_SE which closes with the activation of the OAC alarm.

Notice: The use of the OAC physical contact requires the connection of the OAC/PTA cable to the OAC port located under the front cover of the P_SE MCCB. Refer to the P_SE User Manual for details on the OAC/PTA cable and physical contact requirements,

The OAC is configurable by assigning it an alarm type (assignment), and the contact behaviour (reset mode), which can made using one or a combination of the TPED or TPCM.

The physical contact mode is defined as either Auto-reset mode, or latching mode:

Auto-reset mode: Contact will remain CLOSED for up to 500ms after the alarm deactivates, at which point it will OPEN automatically.

Latching mode: Contact will remain CLOSED after the alarm deactivates, until the alarm is cleared via the P_SE embedded display or the TPED.

Notice: Where the PTA (Pre trip alarm) is assigned to OAC, the contact operation mode is forced to auto-reset mode, where the contact will OPEN up to 500ms after the PTA is no longer active.

Optional alarms List

ID	Custom Alarm Assignment	Remark
0	None	
1	High OCR internal temperature	
2	Neutral monitoring wire disconnection	3Ph+N Only
3	OCR self-test failure	
4	Reserved	
5	PTA (Pre trip alarm)	
6	Custom Alarm 1	
7	Custom Alarm 2	
8	Custom Alarm 3	
9	Custom Alarm 4	
10	Custom Alarm 5	
11	Custom Alarm 6	
12	Custom Alarm 7	
13	Custom Alarm 8	
14	Custom Alarm 9	
15	Custom Alarm 10	
16	Custom Alarm 11	
17	Custom Alarm 12	

Write Protection

WARNING: Changes and adjustments to protection settings and levels (either local or remotely) should only be performed by qualified personnel. Failure to comply may result in malfunction or damage of protective equipment, serious injury or death.

Modifications made remotely via the TPED to the MCCB configuration settings may be dangerous for personnel near the circuit breaker or may cause damage to the equipment if the protection parameters are modified.

Therefore, remote data write commands are secured with two levels of protection:

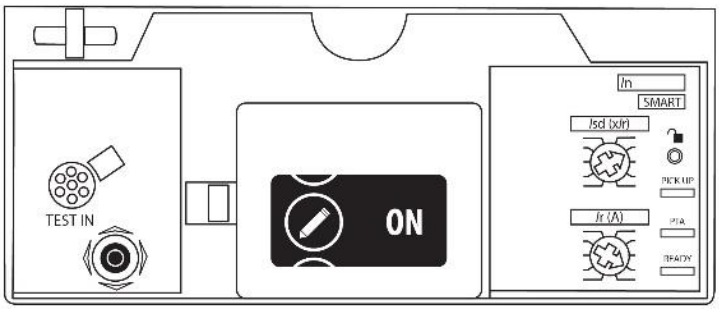
- Remote Write Authorization parameter at the MCCB for localized locking out of individual circuit breakers from remote writing access.
- Password Management for limiting accessibility of performing certain configuration changes.

Remote Write Authorization

To permit writing of data to the MCCB via remote devices (i.e., external to the MCCB, such as TPCM, TPED, etc.), the remote write authorization parameter must be enabled on the MCCB via the embedded LCD menu.

This parameter is enabled via the Configuration menu of the embedded display by navigating to the Remote Write Authorization symbol as shown below and changing the value to “ON”.

Refer to the P_SE User Manual for further information on navigating the embedded display.



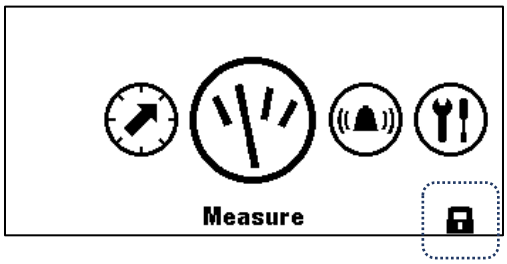
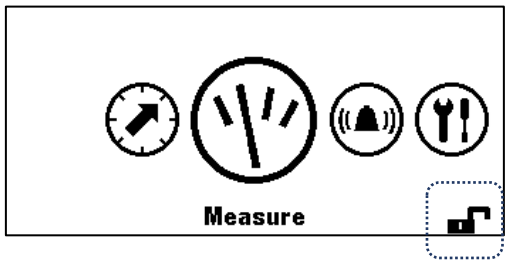
Remote Write Authorization	Default setting
ON – OFF ON – enabled, data write commands for remote devices permitted. OFF – disabled, data write commands for remote devices prohibited.	ON

Write Protection

Password Management

Changes to certain configuration settings are protected by varying security access levels. To enable changing of protection settings on the TPED, a password must be entered.

The display indicates that its password lock status via a padlock symbol on the lower right of the display.

Locked	Unlocked
	

To unlock the TPED, press the Function Key “Fn” and enter the password by increasing or decreasing each of the four digits to the required value.

The default password is: **3333**.

Refer to Configuration – Passwords section for details on password entry and password changes.

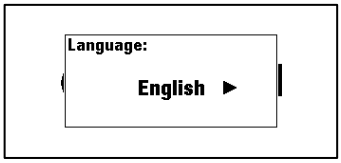
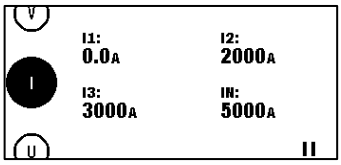
WARNING: The default passwords should be changed during commissioning to prevent unauthorized modification to protected settings.

WARNING: If the password is lost, it cannot be reset to factory default settings. The TPED must be replaced.

Configuration

Starting the TPED for the First Time

The first time the TemView *PRO* is powered up the display will ask you to choose the navigation language.
Default is: **English**.

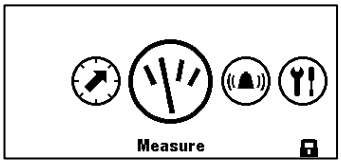
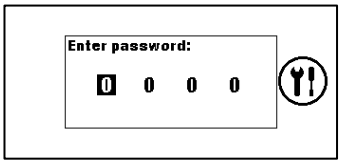
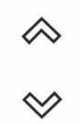
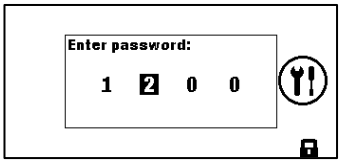
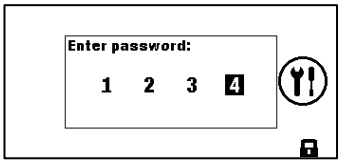
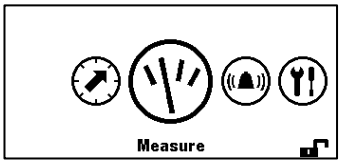
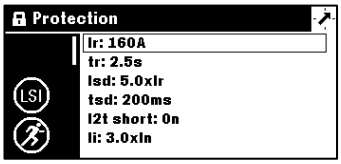
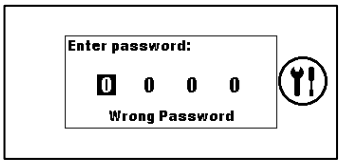
	Action	Key	Screen
1	Select another language	< >	
2	Confirm the selection: - The screen is displayed in the language chosen. - The screen will switch to Default Display	OK	

Configuration

Passwords

Password Entry

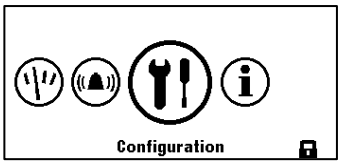
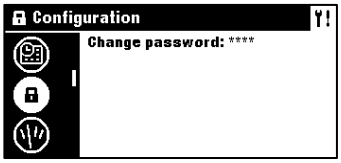
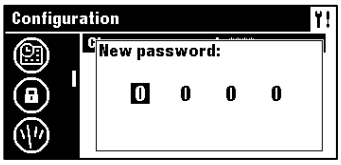
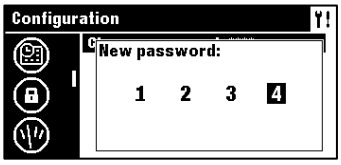
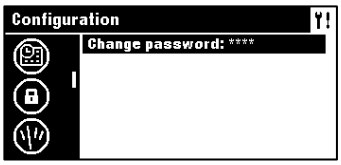
WARNING: The default passwords should be changed during commissioning to prevent unauthorized modification to protected settings.

	Action	Key	Screen
1	Open the Main menu - The presence of a padlock means that the screen is locked.		
2	Open pop-up for password entry - The password must be 4 figures long. (default 3333)		
3	Increase/decrease the value		
4	Select the next numbers and position the values		
5	Confirm your entry: Result - The screen is unlocked - The padlock symbol is open - The sub-menus are no longer locked		  
6	If the password is incorrect, it must be entered again. (Repeat from step 3)	-	

Configuration

Password Change

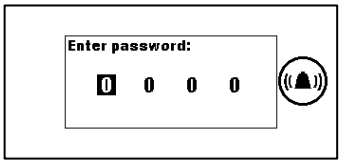
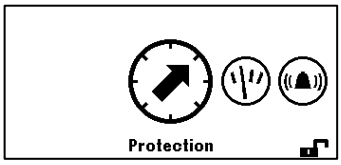
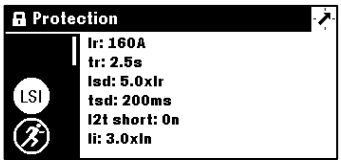
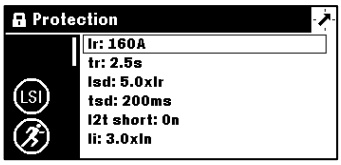
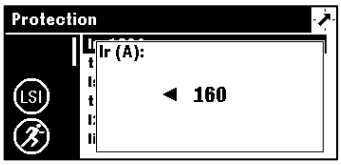
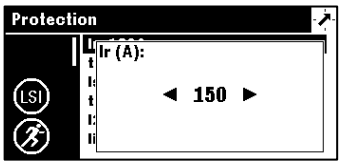
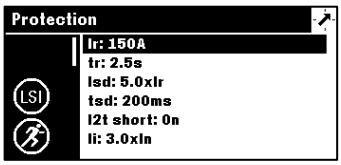
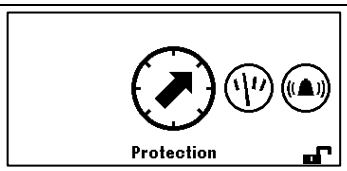
WARNING: If the password is lost, it cannot be reset to factory default settings. The TPED must be replaced.

	Action	Key	Screen
1	Open the Configuration menu	OK	
2	Select the sub-menu "Change the password"	^ v	
3	Confirm the selection and enter the new password	OK	
4	Increase/decrease the value	^ v	
5	Select the next numbers and position the values	< >	
6	Confirm the entry	OK	

Configuration

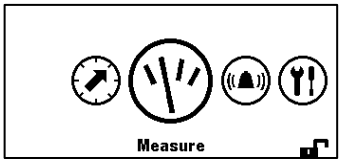
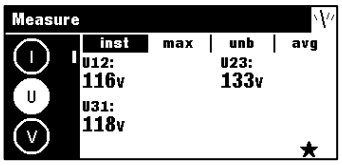
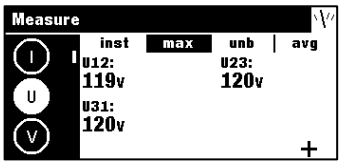
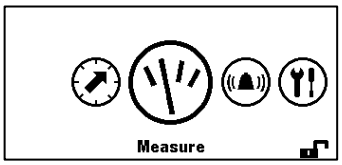
Protection Settings

WARNING: Risk of nuisance tripping.
Only qualified personnel are to set the protection levels. Failure to respect these instructions may cause death, serious injuries or equipment damage.

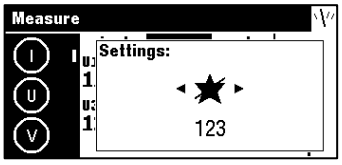
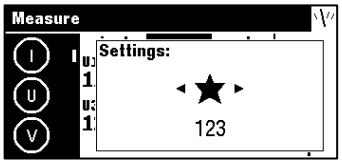
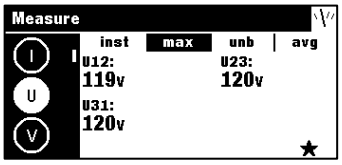
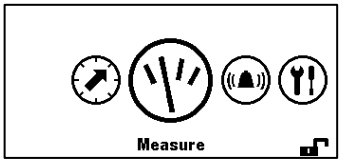
	Action	Key	Screen
1	Ensure the Display is unlocked. Refer to Password Entry section	Fn OK	
2	Select protection	OK	
3	Scroll to the required protection sub-menu	^ v	
4	Select the required sub-menu	OK	
5	Select the require protection parameter	OK	
6	Adjust the settings with the left and right arrows	< >	
7	Confirm the require value.	OK	
8	Repeat steps 5-9 for other protection parameters		
9	Once Complete Press the back button twice to return to the Main Menu	↺	

Configuration

Measurements Display

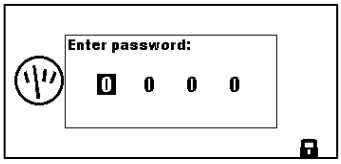
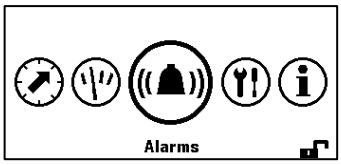
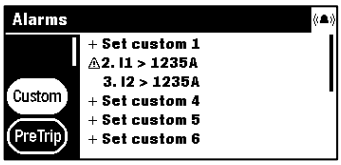
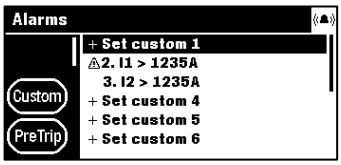
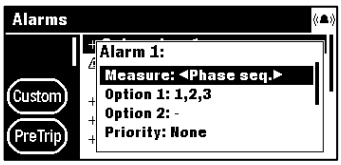
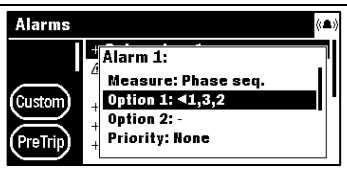
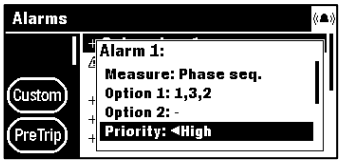
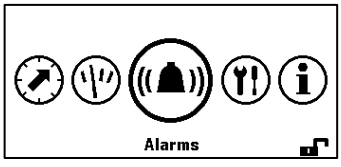
	Action	Key	Screen
1	To view the displayed measurements Select Measure from the Main Menu	OK	
2	Scroll up or down to view the sub-menus		
3	Scroll left or right to view the sub-measurements		
4	Press the back button to return to the Main Menu		

Selecting a Favourite

	Action	Key	Screen
1	Once in the Measurements Display Menu Press the Function button on the required measurement	Fn	
2	Scroll left or right to enable Favourite		
3	Once set to the require Favourite setting confirm the setting	OK	
4	Press the back button to return to the Main Menu		

Configuration

Setting a Custom Alarm

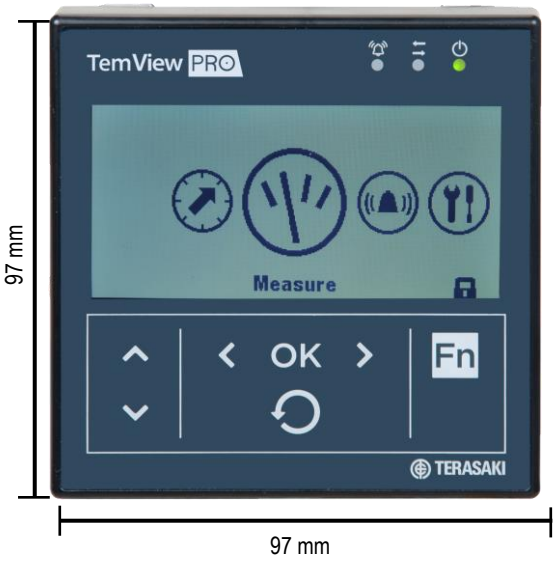
	Action	Key	Screen
1	Ensure the Display is unlocked. Refer to Password Entry section	Fn OK	
2	Select Alarms	OK	
3	Select Custom	OK	
4	Select a free alarm slot	OK	
5	Using the left or right arrow, set the required measurement		
6	Using the up or down arrow, scroll through the required options		
7	Once all the require parameters have been entered Confirm the custom alarm	OK	
8	Repeat steps 5-9 for other custom alarms		
9	Once Complete Press the back button twice to return to the Main Menu		

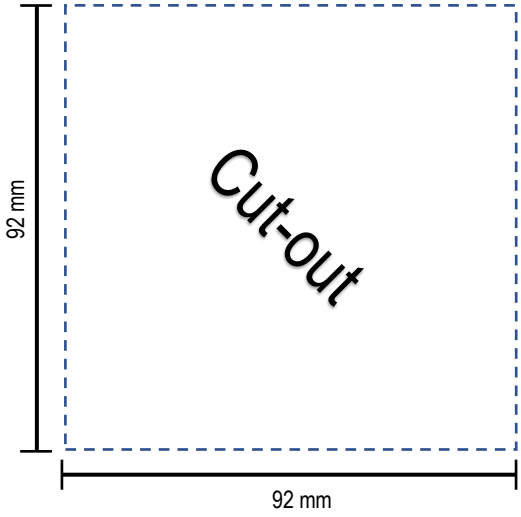
Troubleshooting

In the event of a problem when using the TPED, this section provides advice on how to resolve issues.

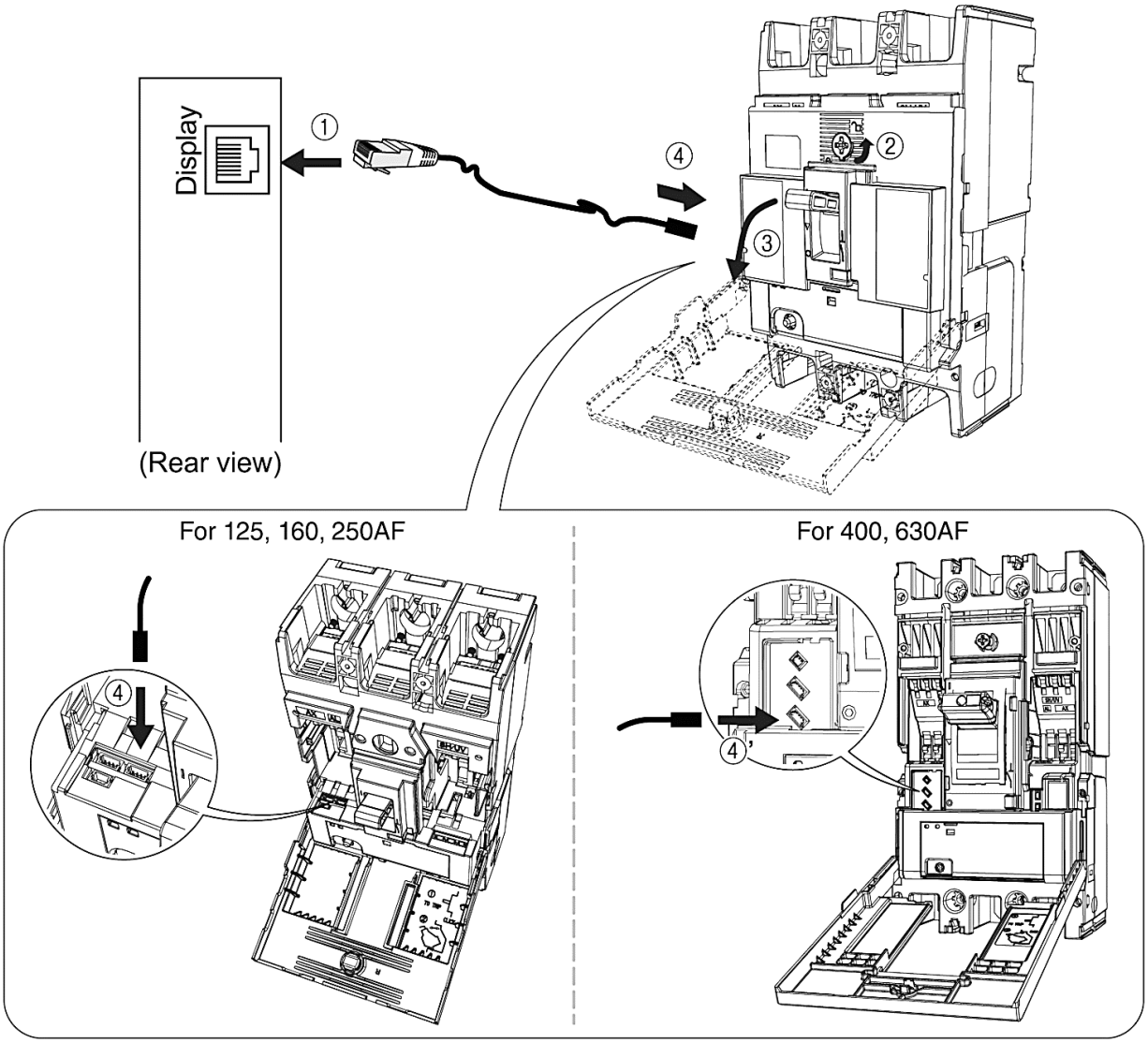
	Problem	Possible cause	Remedial advice
1	Ready LED OFF or Display is blank	Insufficient or no power to the OCR	Verify power supply requirements. Refer to Power Supply section. Verify external 24V dc power supply is operational at correct voltage and is capable of delivering sufficient current to all connected devices (including P_SE OCR, TPED and TPCM where used)
		Incorrect or faulty wiring	Verify integrity of wiring and connections. Check for and correct any: - Loose connection of CIP connector and cable in both P_SE MCCB and TPED. - Loose connection of CIP cable to external supply terminals - Incorrect supply terminals / conductors / connector pins Refer to Installation section.
		P_SE MCCB CIP connector is faulty	Swap the connections on the two CIP adapter cables plugged into the accompanying P_SE MCCB. If fault clears then there is a fault with the original CIP connector, or the cable was not originally seated in the connector properly. If possible, continue to use the new CIP connector arrangement, otherwise replace the P_SE MCCB. If the fault does not clear, then verify the integrity of the CIP cable and replace if necessary.
		TPED is faulty	Replace TPED.
3	Communication error or display stuck on "TERASAKI" logo	Incorrect or faulty wiring	Verify integrity of wiring and connections. Check for and correct any: - Loose connection of CIP connector and cable - Loose connection of CIP cable to external supply terminals - Incorrect supply terminals / conductors / connector pins Refer to Installation section.
		P_SE MCCB CIP connector is faulty	Swap the connections on the two CIP adapter cables plugged into the accompanying P_SE MCCB. If fault clears then there is a fault with the original CIP connector, or the cable was not originally seated in the connector properly. If possible, continue to use the new CIP connector arrangement, otherwise replace the P_SE MCCB. If the fault does not clear, then verify the integrity of the CIP cable and replace if necessary.
		TPED is faulty	Replace TPED.
4	Measurement values incorrect.	Incorrect measurement settings	Review the measurement calculation and network/topology settings. Incorrect settings can produce inaccurate measurements. Refer to the P_SE User Manual for details on Measurements and settings.
5	MCCB locked	P_SE MCCB Remote Write Authorization is set to OFF	Refer to Remote Write Authorization section for details on enabling access to remote changes to MCCB settings.
6	Lost / forgotten password	N/A	If the TPED password is lost, it cannot be reset or restored. TPED must be replaced. Refer to Password Management section.

Annex A – Dimensions





Annex B – Connection Diagram



TemView PRO User Manual

Version
1.1.0
Published
23rd August 2021

NHP Electrical Engineering Products

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