sprecher+
schuh

CET 5 Modular Protection System

Quick Start

IMPORTANT This guide Does Not replace the User Manual, publication CET 5-UM004_-EN-P, and is intended for qualified service personnel responsible for setting up and servicing these devices. You must have previous experience with and a basic understanding of electrical terminology, configuration procedures, required equipment, and safety precautions.

Important User Information

Because of the variety of uses for the products described in this publication, those responsible for the application and use of this control equipment must satisfy themselves that all necessary steps have been taken to assure that each application and use meets all performance and safety requirements, including any applicable laws, regulations, codes, and standards.

The illustrations, charts, sample programs and layout examples shown in this guide are intended solely for purposes of example. Since there are many variables and requirements associated with any particular installation, Rockwell Automation does not assume responsibility or liability (to include intellectual property liability) for actual use based upon the examples shown in this publication.

Rockwell Automation publication SGI-1.1, Safety Guidelines for the Application, Installation and Maintenance of Solid-State Control (available from your local Sprecher + Schuh distributor), describes some important differences between solid-state equipment and electromechanical devices that should be taken into consideration when applying products such as those described in this publication.

Throughout this manual we use notes to make you aware of safety considerations.

ATTENTION Identifies information about practices or circumstances that can lead to personal injury or death, property damage or economic loss.

Attention statements help you to:

- Identify a hazard
- Avoid a hazard
- Recognize the consequences

IMPORTANT Identifies information that is critical for successful application and understanding of the product.

Trademark List

DeviceNet and the DeviceNet logo are trademarks of the Open Device Vendors Association (ODVA).

Microsoft Windows is a registered trademark of the Microsoft Corporation.

European Communities (EC)

Directive Compliance

The CET 5 Modular Protection System is CE marked for installation within the European Union and EEA regions. It has been designed and tested to meet the following directives.

EMC Directive

TIP

This product has been designed for environment A (heavy industrial). Use of this product in environment B (light industrial or domestic) can cause unwanted electromagnetic disturbances in which case the user could be required to take adequate mitigation measures.

This product is tested to meet the Council Directive 89/336/EEC Electromagnetic Compatibility (EMC) by applying the following standards, in whole:

- EN 60947-4-1 — Low-Voltage Switchgear and Controlgear: Part 4: Contactors and Motor Starters - Section 1: Electromechanical Contactors and Motor Starters
- EN 60947-5-1 — Low-Voltage Switchgear and Controlgear: Part 5: Control Circuit Devices and Switching Elements - Section 1: Electromechanical Control Circuit Devices

This product is intended for use in an industrial environment.

Low Voltage Directive

This product is tested to meet Council Directive 73/23/EEC Low Voltage as amended by 93/68/EEC by applying the safety requirements of EN 60947-4-1 and EN 60947-5-1. For specific information required by EN 60947-4-1 and EN 60947-5-1, see the appropriate sections in this publication.

To obtain a copy of the CET 5's Declaration of Conformity (DoC), contact your local Sprecher + Schuh distributor.

Quick Start Guide — Sprecher + Schuh CET 5 Modular Protection System

Introduction

Follow these steps to successfully commission the CET 5 Modular Protection System.

Table A: Commissioning Procedure

Step	Description
1	General Precautions
2	Hardware Installation
3	Wiring Installation
4	Front Panel Operation
5	System Configuration
6	Port 4 Settings
7	Programming General Parameters
8	Programming Operational Parameters
9	Programming Protection Functions
10	Output Relay and Input Assignments

General Precautions

ATTENTION

Have only qualified personnel service this equipment. If you are not qualified to service this equipment, you can injure yourself or others, or cause equipment damage.

ATTENTION

Equipment components are sensitive to electrostatic discharge (ESD). Undetectable permanent damage can result if you do not use proper ESD procedures. Ground yourself, your work surface, and this equipment before removing any cover from this equipment.

ATTENTION

Disconnect or de-energize all external connections before opening this device. Contact with hazardous voltages and currents inside this device can cause electrical shock resulting in injury or death.

ATTENTION

To install an option card the relay must be de-energized and then reenergized. When reenergized, the relay will reboot. Therefore, de-energize the protected motor before installing the option card to prevent damage to the motor.

IMPORTANT

For complaince to IEC standards regarding thermal overload protection, set the SERVICE FACTOR to a value: 1.05…1.20.

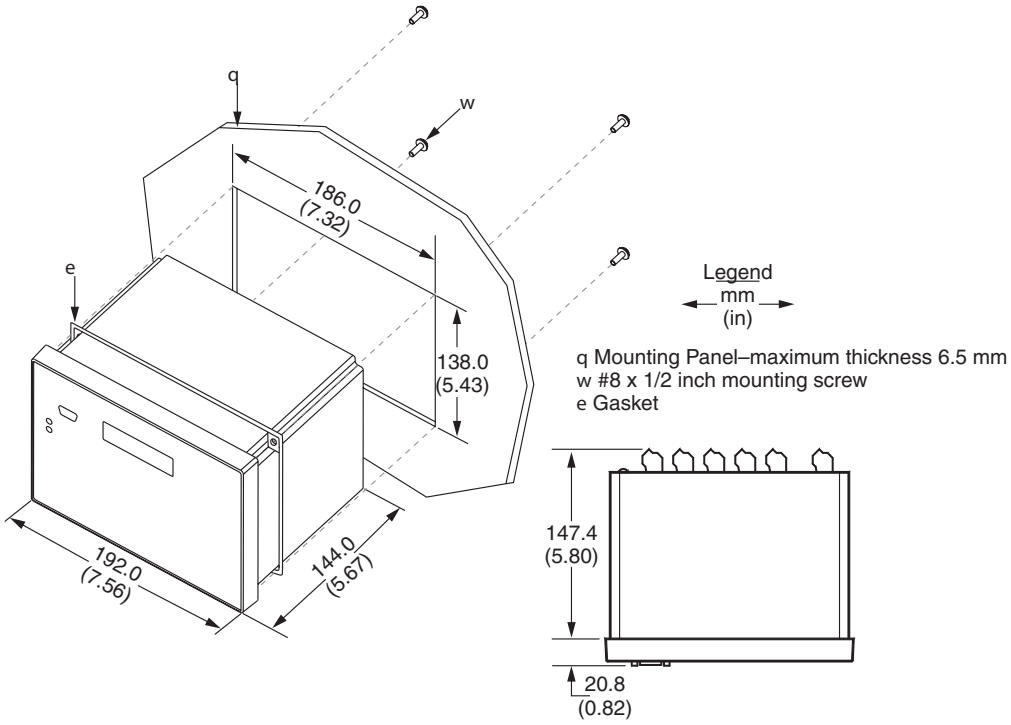
IMPORTANT

For a properly configured device, the settings in the Main Settings and Overload Settings groups should be adjusted according to the motor and system requirements. Settings in other groups can be programmed as desired.

Hardware Installation

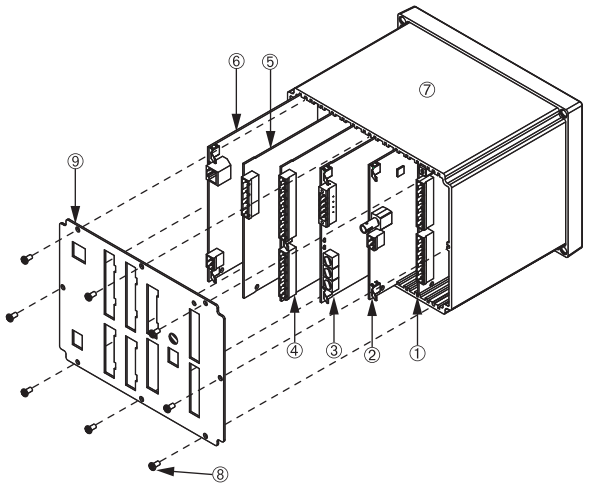
Relay Mounting

Figure 1 Mounting and Dimensions



Option Cards

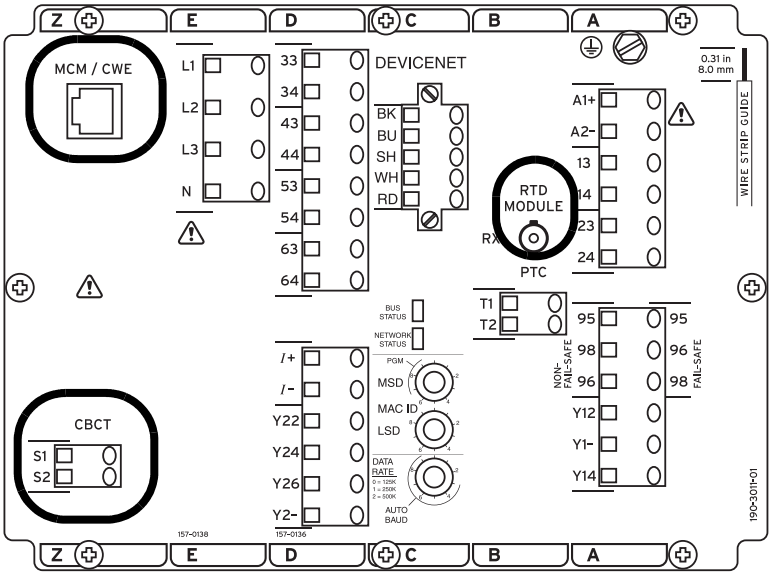
Figure 2 Inserting Option Cards



① Power Supply & I/O Board (Slot A)
② RTD, PTC Board (Slot B)
③ Communications Board (Slot C)
④ Additional I/O Board (Slot D)
⑤ Optional Voltage Board (Slot E)
⑥ CWE, Core Balance Board (Slot Z)
⑦ CET 5 Relay Case
⑧ Mounting Screws
⑨ Back Cover

Converter Modules and Optional Core Balance CT, RTD Scanner

Figure 3 Converter Module, CBCT, and RTD Scanner Connections



IMPORTANT Settings associated with options or accessories (converter module, voltage input card, expansion I/O card, RTD scanner) require their installation or connection prior to being made available for configuration.

1. The CET 5 relay is not EMC-Tested for converter module connecting cable lengths greater than the 4-meter cable that is supplied.

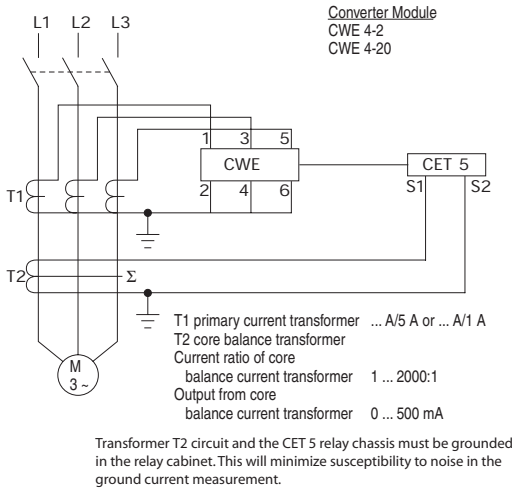
2. Up to 12 RTDs can be monitored when an external RTD Scanner is used. There are separate trip and warning settings for each RTD.

3. A simplex 62.5/125 µm fiber-optic cable with ST connector is needed for connecting the external RTD module to the CET 5. (Fiber optic cable is not supplied. Contact your local Sprecher + Schuh distributor.)

Wiring Installation

Main Circuit

Figure 4 Relay with Phase CTs and CoreBalance CT



Transformer T2 circuit and the CET 5 relay chassis must be grounded in the relay cabinet. This will minimize susceptibility to noise in the ground current measurement.

Figure 5 Relay without Phase CTs

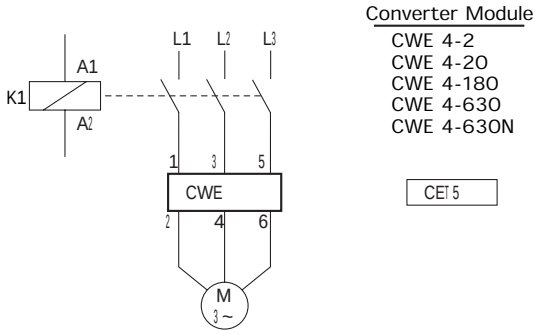


Figure 6 Voltage Connections (Optional Card required)

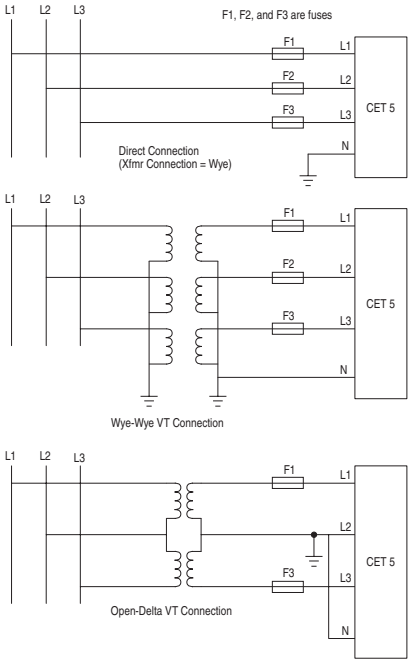
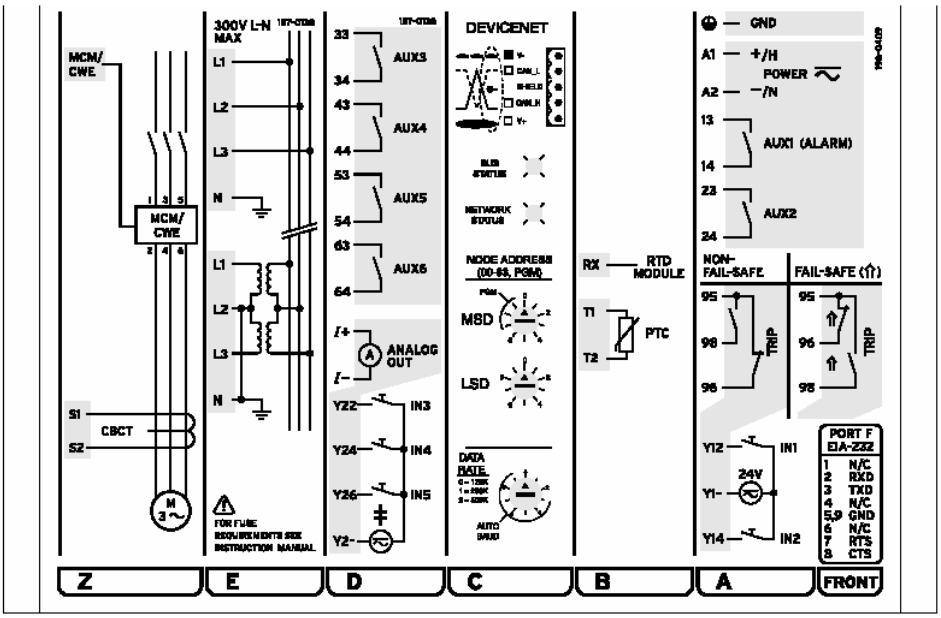


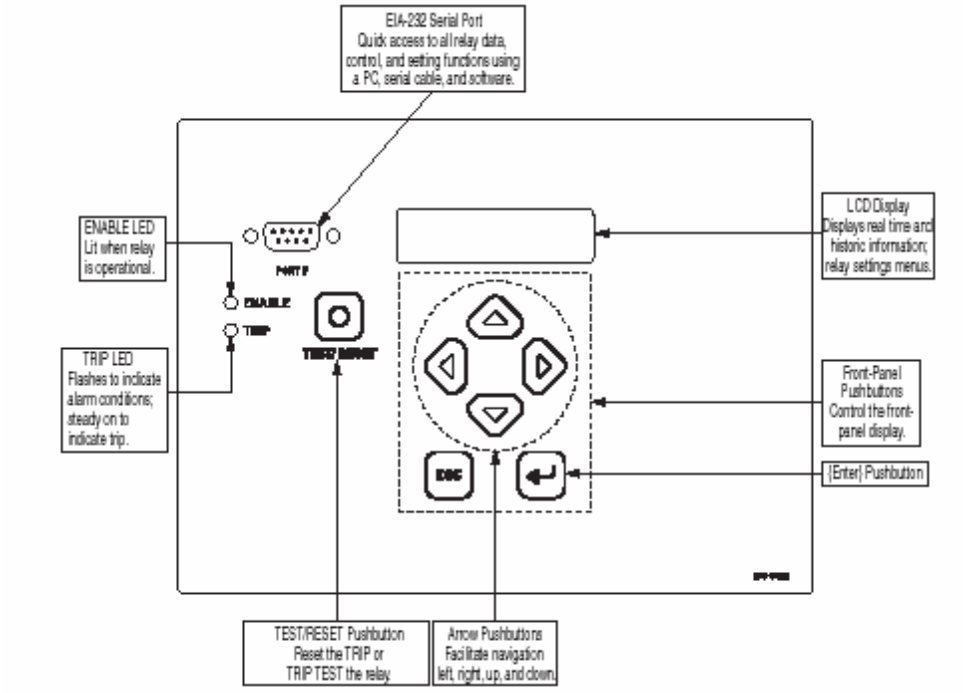
Figure 7 Input/Output
Slots C, D and E are for option cards. Rated supply voltage is 110...240V AC or 110...250V DC



IMPORTANT Be sure to properly label and connect the Trip relay terminals according to the programmed behavior; factory default setting is "Fail-Safe".

Front Panel Operation

Figure 8 Relay Front Panel



The following table provides a description for each programming key's function.

Table B: Front Panel Programming Key Description

Push Button		Function
	UpArrow	Move up within a menu or data list. While editing a setting value, increase the value of the underlined digit.
	DownArrow	Move down within a menu or data list. While editing a setting value, decrease the value of the underlined digit.
	LeftArrow	Move the cursor to the left. While viewing event data, move to data for a newer event.
	RightArrow	Move the cursor to the right. While viewing Event data, move to the data for an older event.
	Esc	Re-activate the front-panel display back-lighting. Escape from the current menu or display.
	Enter	Move from the default display to the main menu. Select the menu item at the cursor. Select the displayed setting to edit the setting.
	Trip/Reset	Trip test the device. Reset the trip.

Saving Settings

It is important to note that programmed values become operational only after they have been saved to memory. The programming system will prompt to save settings when the user navigates higher up in the programming menu by pressing the ESCape key. The front panel display is as follows:

Save Changes?
Yes No

To save changes, place the cursor at "Yes" and press the Enter key.

System Configuration

The CET 5 displays "STATUS FAILURE" on initial start-up and after a hardware configuration change. The second line of the display identifies the cause of failure; if more than one configuration change is found, the highest priority error is identified. To remove the failure, the new system hardware configuration must be manually accepted. Use the following procedure with the front panel programming keys:

1. Select "Status" from the MAIN menu and press the Enter key. The front panel displays the following:

   Confirm Hardware
   Config (Enter)

2. Press the Enter key. The front panel displays the following:
   Accept Config?
   Yes No

3. Position the cursor at "Yes" and press the Enter ↵ key. The CET 5 programming system checks parameter settings to ensure that no interdependency setting errors exist. If none exist, the front panel displays the following:

   Config Accepted
   Enter to Restart

IMPORTANT

If the system check finds interdependency setting errors, the front panel display:

Settings Mismatch

An example of mismatched settings is the correlation between the Motor FLA and Phase CT Ratio settings. Review setting values to determine where the mismatch exists or, if little or no programming has been performed yet, reset the CET 5 relay to factory default values using the following path:

MAIN > Reboot/Restore > Restore Defaults

The front panel then displays:

Restore Default?
No Yes

Position the cursor at "Yes" and press the Enter ↵ key. The CET 5 relay will reboot at this point.

Return to the first step of the System Configuration process.

4. Press the Enter ↵ key. The CET 5 reboots and the "Enable" LED illuminates with the following displayed on the front panel.

   CET 5 MODULAR
   PROT SYSTEM

   If the LCD display COMMFLT WARNING, configuration of the Port 4 is required. See next section.

Port 4 Settings

The Port 4 settings configure slot C for communications. Factory default settings are for DeviceNet communications. Use the following path with the front panel programming keys to access the Port 4 settings:

MAIN > Set/Show > Port > Port 4

The following table provides direction for the proper settings associated with each communication option.

Table C: Communication Settings

Setting Prompt	Setting Range	DeviceNet	Modbus	Empty
COMM INTERFACE ❶	232, 485	232	485	232
PROTOCOL	ASC, MOD	MOD	MOD	MOD
SPEED	300 … 38,400 bps	19,200	19,200	19,200
PARITY	O, E, N	N	N	N
MODBUS SLAVE ID	1 … 248	248	1 to 247	1

❶ A 232 setting is possible, although not typical.

IMPORTANT

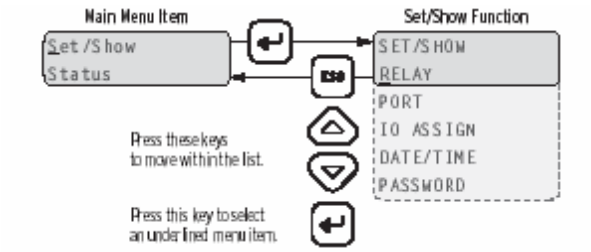
The CET 5 displays "COMMFLT Warning" on initial power-up with factory default settings when the hardware installed in Slot C is as follows:

- Empty
- Modbus
- DeviceNet, but not powered

Programming General Parameters

Use the following path with the front panel programming keys to access the general parameter settings:

MAIN > Set/Show > Port
MAIN > Set/Show > Date/Time
MAIN > Set/Show > Password



Port: In addition to configuring Slot C (Port 4) for communications as described in Step 4, settings are available for configuring the Port F (front panel) RS 232 communications. Port F is available for computer connection.

Date/Time: Program the date (day, month, year) and time (hour, minutes, seconds) with the settings available here.

Password: The CET 5 provides the ability to set password protection to limit access to the programmable settings from the front panel. Password protection is disabled from the factory.

See Appendix A for more details.

Programming Operational Parameters

Use the following path with the front panel programming keys to access the operational parameter settings:

MAIN > Set/Show > Relay > [Group]

Table D: Operational Parameters

Group	Description
Main Settings	Basic system settings related to three-phase power source (e.g. line voltage rating and frequency), motor rated current, and transformer (current and voltage) data.
I/O Settings	Settings related to configuration of the optional analog output.
Trip Inhibit	Settings to configure the blocking of tripping functions. These settings coordinate with assignment of a discrete input for "Block Protection".
Relay Behavior	Settings for configuring the output relays.
Timer Settings	On-delay and off-delay timer settings for enhanced control capability of the auxiliary output relays.
Front Panel Settings	Settings for controlling the front panel LCD operation.
Display Settings	Settings to select data that is displayed in the rotating status

See Appendix A for more details

Programming Protection Parameters

Use the following path with the front panel programming keys to access the protection parameter settings:

MAIN > Set/Show > Relay > [Group]

Table E: Protection Parameters

Group	Description
Overload Settings	Thermal overload
Short Ckt Settings	Short circuit
GF-CB Settings	Ground/earth fault (core balance method)
GF-Res Settings	Ground/earth fault (residual method)
Jam Settings	Mechanical jam (overcurrent)
Undercurrent Settings	Current-based underload detection
Current Imb Settings	Current imbalance (asymmetry)
Prot. Disable	Settings to disable protection elements during motor starting for a user-specified time period
Start Monitoring	Stall protection on motor start (current-time based)
Star-Delta Settings	Settings for star-delta control
Start Inhibt Set	Settings for starts/hour and antibackspin
Phase Rev Settings	Phase reversal (sequence)
Speed Sw Set	Stall protection on motor start (speed switch input monitoring)
PTC Settings	Thermistor monitoring
RTD Settings	RTD settings for use with optional RTD Scanner
Undervoltage Settings	Voltage monitoring with optional voltage input card
Overvoltage Settings	Voltage monitoring with optional voltage input card
VAR Settings	Reactive power
Underpower Settings	Power-based underload detection
Power Factor Settings	Displacement power factor monitoring
Freq Settings	Line frequency monitoring
Load Control Settings	Settings for relay control based on motor loading

See Appendix A for more details.

Output Relay and Input Assignments

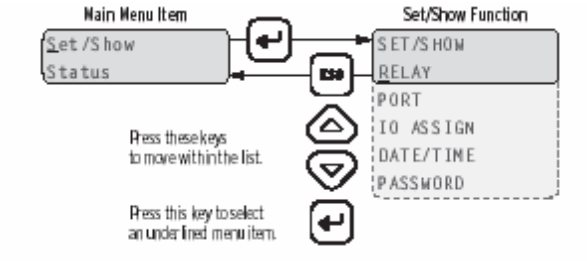
After the operational and protection parameter values are set, the next step is to assign these functions to the relays.

ATTENTION

Protection elements have no effect until they are assigned to the Trip relay or an auxiliary relay.

To assign functions to the output relays and inputs, use the following path:

MAIN > Set/Show > IO Assign



TIP

The relay outputs will function as a N.C. contacts when the relay behavior setting is Fail-Safe (Y), and will function as a N.O. contacts when the relay behavior setting is Non-Fail-Safe (N).

Trip Relay Assign

The CET 5 allows mapping of only protection trip elements to the Trip output relay. Settings are presented as bit-enumerated strings. The second line of the display identifies a given bit's associated function. To assign a function to the Trip relay, simply program a value "1" in the bit location for each element you desire to assign using the TRIP A through TRIP D settings. The front panel display appears as follows:

TRIPA=**1**0110000
OVERLOAD

Table F: Trip Relay Settings

	Bit							
	0	**1**	**2**	**3**	**4**	**5**	**6**	**7**
TRIP A	Overload	Undercurrent	Jam	Current Imbalance	Short Circuit	RTD - W/B	PTC	Ground Fault (Res)
TRIP B	VAR	Underpower	Under-voltage	Over-voltage	Phase Reversal	Power Factor	Speed Switch	Ground Fault (CB)
TRIP C	Start Time	Freq 1	Freq 2	RTD (Other)	RTD (Ambient)	PTC Error	RTD Error	MCM Error
TRIP D	Comm Idle	Comm Loss	Remote Trip	Comm Fault	Reserved	Reserved	Reserved	Reserved

TIP

Make sure the Trip relay terminals (95, 96 and 98) are labeled to correspond with the relay behavior setting (Fail-Safe or Non-Fail-Safe).

AUX# Assign

The CET 5 allows mapping of protection (trip and warning) and general-purpose control elements to the auxiliary outputs. Assign functions to the auxiliary relays in the same manner as performed with the Trip relay settings.

Table G: Auxiliary Relay Functions

	Bit							
	0	**1**	**2**	**3**	**4**	**5**	**6**	**7**
AUX# A	Overload	Undercurrent	Jam	Current Imbalance	Short Circuit	RTD - W/B	PTC	Ground Fault (Res)
AUX# B	VAR	Underpower	Under-voltage	Over-voltage	Phase Reversal	Power Factor	Speed Switch	Ground Fault (CB)
AUX# C	Start Time	Freq 1	Freq 2	RTD (Other)	RTD (Ambient)	PTC Error	RTD Error	MCM Error
AUX# D	Comm Idle	Comm Loss	Remote Trip	Comm Fault	Reserved	Reserved	Reserved	Reserved
AUX# E	Overload Warn	Undercurrent Warn	Jam Warn	Curr Imbal Warn	RTD-W/B Warn	Pwr Factr Warn	Gnd Flt-CB Warn	Gnd Flt-Res Warn
AUX# F	VAR Warn	Underpwr Warn	Undervolt Warn	Overvolt Warn	Speed Sw Warn	Freq 1 Warn	Freq 2 Warn	RTD-Othr Warn
AUX# G	RTD-Amb Warn	Setting Warn	General Warn	Load Ctl Upper	Load Ctl Lower	Timer 1	Timer 2	Short Ckt Warn
AUX# H	Stopped State	Running State	Starting State	Star Starting State	Delta Starting State	Start Command	Network Control	Reserved

TIP

The AUX# A through AUX# D bytes are used to map trip functions to the output. The AUX# E through AUX# H bytes are used to map warning and status functions to the output.

IN# Assign

The CET 5 provides the ability to assign a control function to each discreet input. Table H shows the available control functions and the method of assigning them.

Table H: Input Function Assignment

	IN#
0	Emergency Start
1	Disable Settings
2	Trip Reset
3	Timer 1
4	Timer 2
5	Speed Switch
6	Block Protection
7	Speed 2
0	Breaker/Contactor Auxiliary
1	Remote Trip

TIP

The CET 5 allows only one selection per input assignment. Once a selection is assigned, it is not available to other inputs.

Analog Output

The expansion I/O option provides an isolated 4…20 mA DC analog current output with a variety of output parameters. Use the Analog Output Select setting to select a parameter from the list of available options. Table I shows description and scaling of the output for different parameters selections.

Table I:

ANALOG OUT SEL (AOPARM)	Description	Output Scaling (4 mA)…(20 mA) (Unit)
LOAD_I	Average Load Current	0.0…1.0 Per Unit of FLA
AVG_I	Average Load Current	0.2…2.0 Per Unit of FLA
MAX_I	Maximum of the Phase currents	0.2…2.0 Per Unit of FLA
%THERM	Percentage Thermal Capacity	0…100%TCU
WDG_RTD	Hottest Winding RTD Temperature	0…250°C
BRG_RTD	Hottest Bearing RTD Temperature	0…250°C
PWR_kW	Motor Power	0.0…1.0 per unit FLWA
PF	Motor Power Factor	0.8 Lag…0.8 Lead

Appendix A: Menu Structure

IMPORTANT Visibility of some settings depends upon the system hardware configuration. For example, RTD settings are viewable only when the optional RTD Scanner is connected and communicating with the CET 5 relay.

Figure 12 Menu Structure

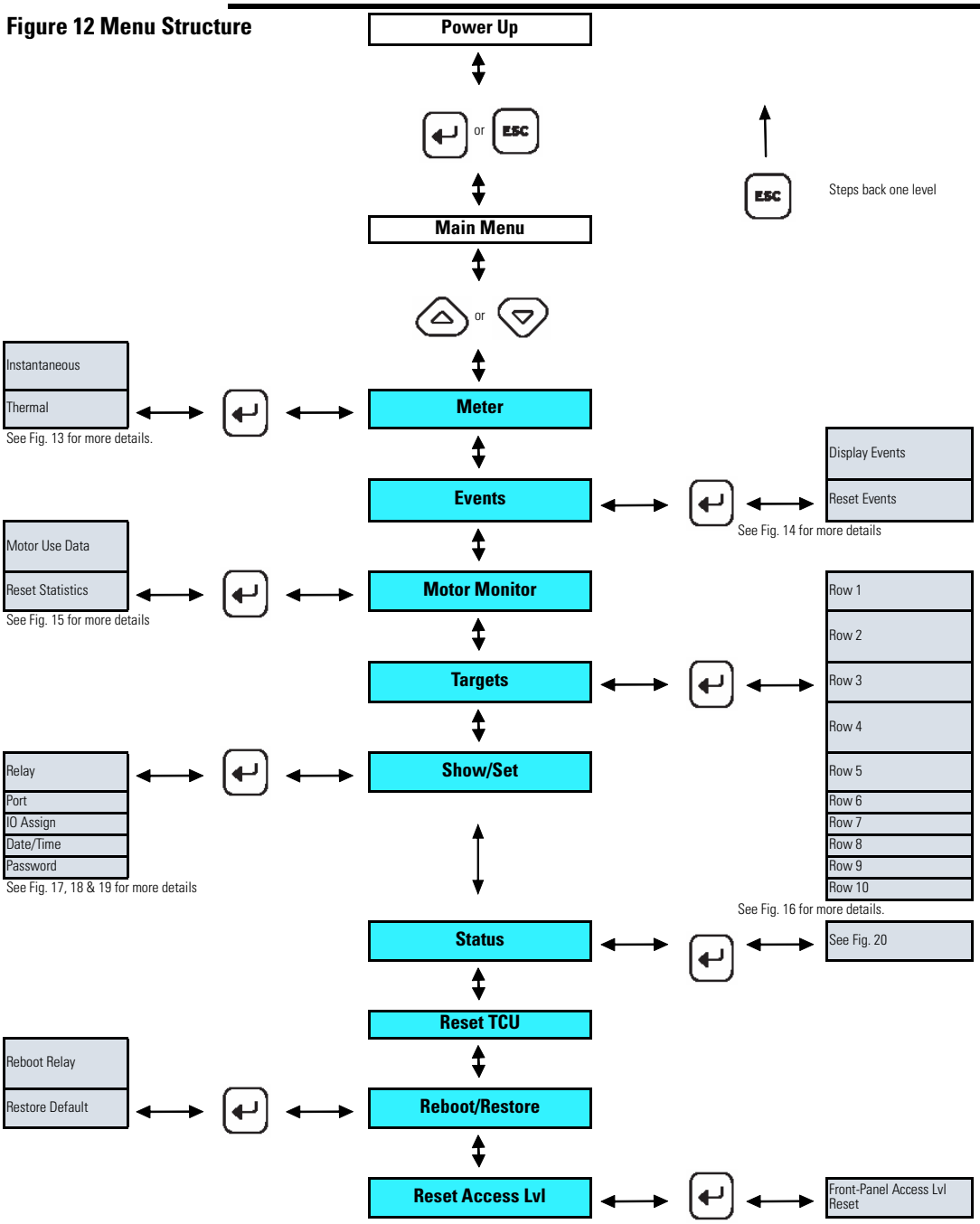


Figure 13 Main Menu > Meter

Figure 13 Main Menu > Meter

Figure 14 Main Menu > Events

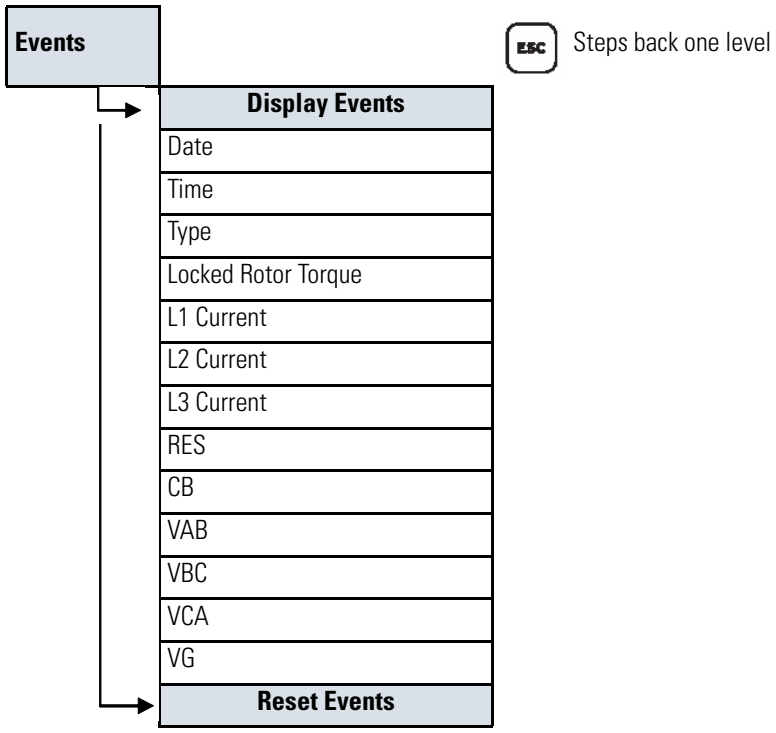


Figure 15 Main Menu > Motor Monitor

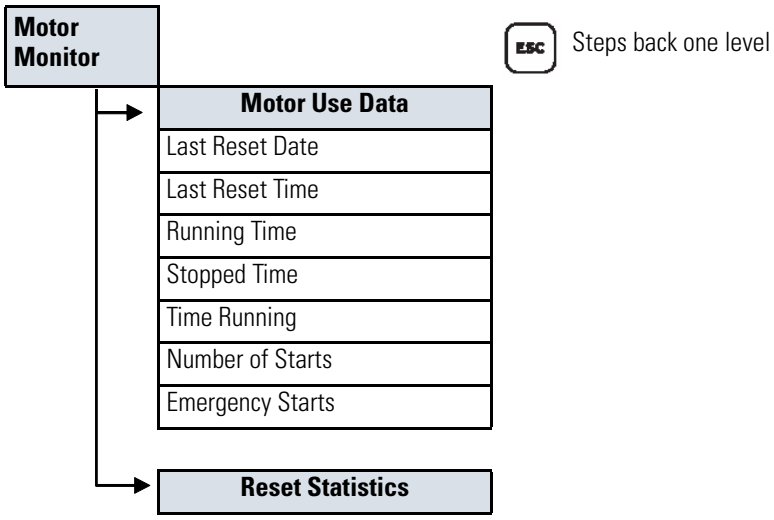


Figure 16 Main Menu > Targets

Targets

ESC Steps back one level

Row 1
49T (Overload Trip)
LOSSTRIP (Undercurrent Trip)
JAMTRIP (Jam Trip)
49UBT (Current Imbalance Trip)
50P1T (Short Circuit Trip)
RTDT (RTD (Widing/Bearing) Trip)
PTCTRIP (PTC Trip)
50G1T (Ground Fault (Residual) Trip)
Row 2
VART (VAR Trip)
37PT (Underpower Trip)
27P1T (Undervoltage Trip)
59P1T (Overvoltage Trip)
47T (Phase Reversal Trip)
55T (Power Factor Trip)
SPDSTR (Speed Switch Trip)
50N1T (Ground Fault (Core Balance) Trip)
Row 31
SMTRIP (Start Time Trip)
81D1T (Frequency 1 Trip)
81D2T (Frequency 2 Trip)
OTHTRIP (RTD (Other) Trip)
AMBTRIP (RTD (Ambient) Trip)
PTCFLT (PTC Error Trip)
RTDFLT (RTD Error Trip)
MCMFLT (MCM Error Trip)
Row 4
COMMIDLE (Comm Idle Trip)
COMMLOSS (Comm Loss Trip)
REMTRIP (Remote Trip)
COMMFLT (Comm Fault Trip)
Reserved
Reserved
Reserved
Reserved
Row 5
49A (Overload Warning)
LOSSALRM (Undercurrent Warning)
JAMALRM (Jam Warning)
46UBA (Current Imbalance Warning)
RTDA (RTD (Winding/Bearing) Warning)
55A (Power Factor Warning)
50N2T (Ground Fault (Core Balance) Warning)
50G2T (Ground Fault (Core Balance) Warning)

Row 6
VARA (VAR Warning)
37PA (Underpower Warning)
27P2T (Undervoltage Warning)
59P2T (Overvoltage Warning)
SPDSAL (Speed Switch Warning)
81D1A (Frequency 1 Warning)
81D2A (Frequency 2 Warning)
OTHALRM (RTD (Other) Warning)
Row 7
AMBALRM (RTD (Ambient) Warning)
SALARM (Setting Warning)
WARNING (General Warning)
LOADUP (Load Control (Upper))
LOADLOW (Load Control (Lower))
TIMER1T (Timer 1)
TIMER2T (Timer 2)
50P2T (Short Circuit Warning)
Row 8
STOPPED (Stopped State)
RUNNING (Running State)
STARTING (Starting State)
STAR (Star (Wye) Starting State)
DELTA (Delta Starting State)
START (Start Command)
Reserved
Reserved
Row 9
IN1 (Input 1 State)
IN2 (Input 2 State)
IN3 (Input 3 State)
IN4 (Input 4 State)
IN5 (Input 5 State)
Reserved
Reserved
Reserved
Row 10
TRIP (Trip Relay State)
AUX1 (Auxiliary Relay 1 State)
AUX2 (Auxiliary Relay 2 State)
AUX3 (Auxiliary Relay 3 State)
AUX4 (Auxiliary Relay 4 State)
AUX5 (Auxiliary Relay 5 State)
AUX6 (Auxiliary Relay 6 State)
Reserved

Figure 17 Main Menu > Show/Set

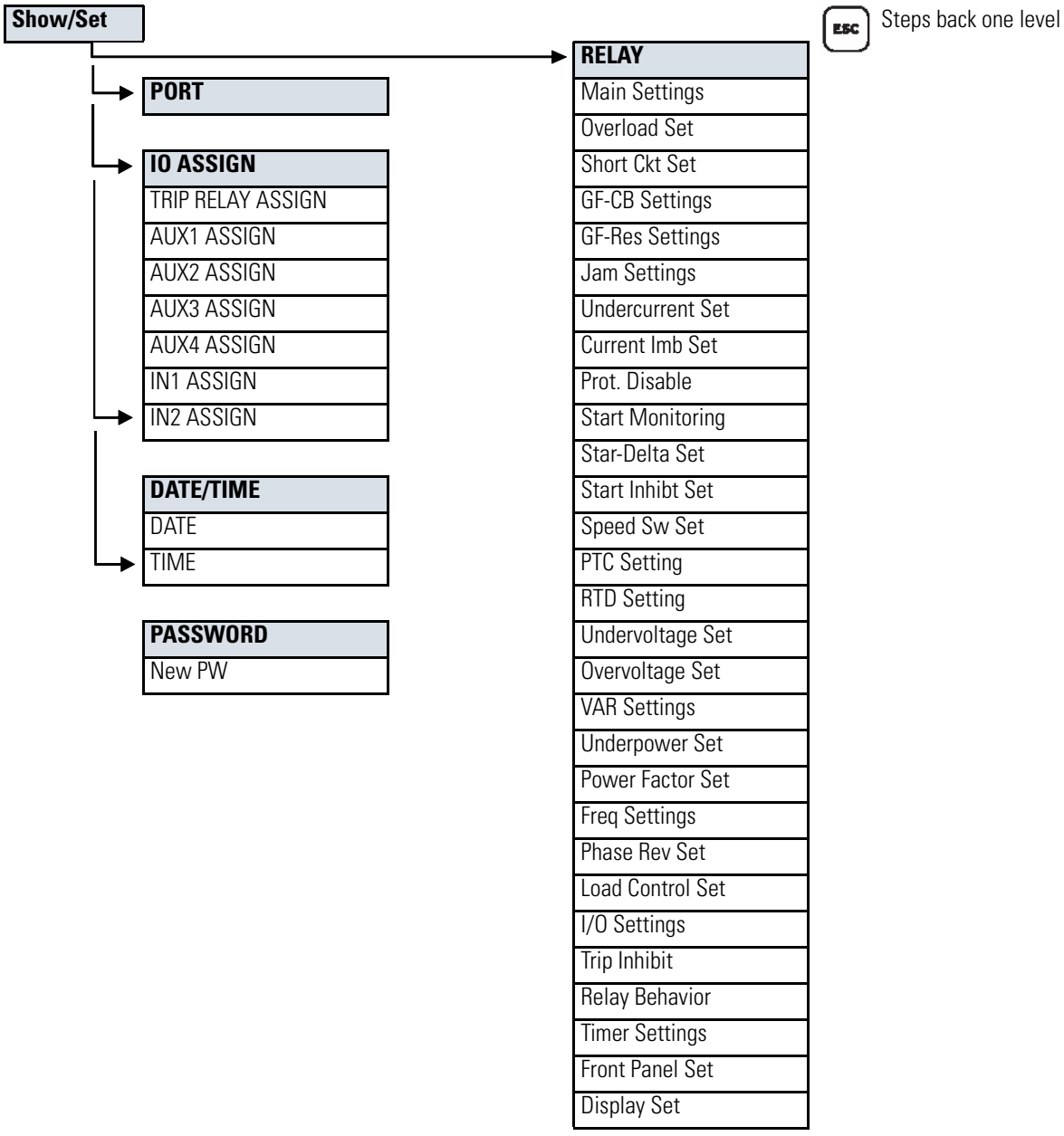
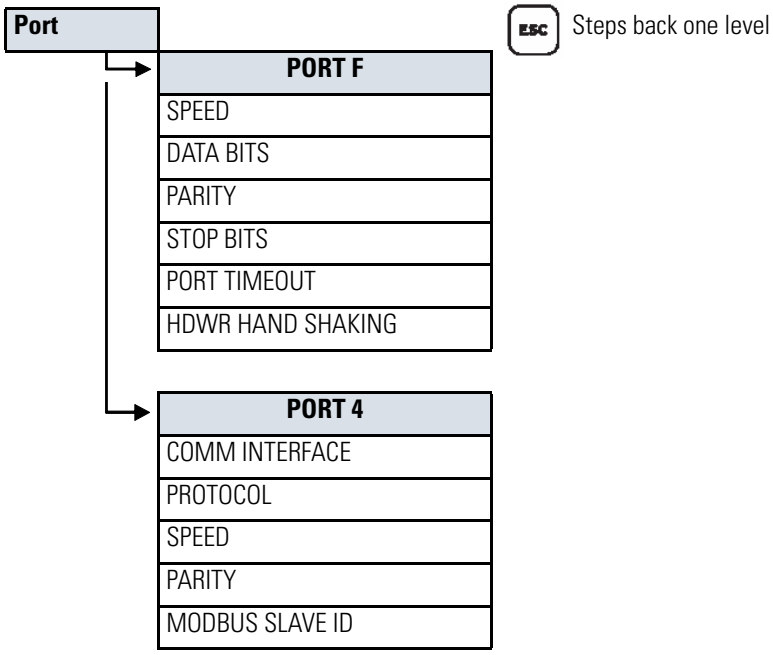


Figure 17 Main Menu > Show/Set



Quick Start Guide — Sprecher + Schuh CET 5 Modular Protection System

Figure 18 Main Menu > Show/Set > Relay

Relay

ESC Steps back one level

Main Settings
UNIT ID LINE 1
UNIT ID LINE 2
PHASE ROTATION
RATED FREQ.
DATE FORMAT
PHASE CT RATIO
MOTOR FLA
TWO SPEED ENABLE
CT RATIO-2nd
MOTOR FLA-2nd
CORE B. CT RATIO
PHASE VT RATIO
LINE VOLTAGE
XFMER CONNECTION
Overload Set
OVERLOAD ENABLE
OL RESET MODE
OL RESET LEVEL
SERVICE FACTOR
MOTOR LRC
LOCKD ROTOR TIME
ACCEL RACTOR
RUN STATE TIME K
MOTOR LRC-2nd
MOTOR LRT-2nd
ACCEL FACT-2nd
RUN ST TC-2nd
OL WARN LEVEL
START INH. LEVEL
STOP COOL TIME
OL RTD BIASING?
Short Ckt Set
SC TRIP LEVEL
SC TRIP DELAY
SC WARN LEVEL
SC WARN LEVEL
GF-CB Setting
GF-CB TRIP LEVEL
GF-CB TRIP DELAY
GF-CB WARN LEVEL
GF-CB WARN DELAY

GF-Res Settings
GF-RES TRIP LEVL
GF-RES TRIP DLAY
GF-RES WARN LEVL
GF-RES WARN DLAY
Jam Settings
JAM TRIP LEVEL
JAM TRIP DELAY
JAM WARN LEVEL
JAM WARN DELAY
Undercurrent Set
UC TRIP LEVEL
UC TRIP DELAY
UC WARN LEVEL
UC WARN DELAY
UC START INHIBIT
Current Imb Set
CI TRIL LEVEL
CI TRIL DELAY
CI WARN DELAY
CI WARN DELAY
Prot. Disable
PROT INHIBT TIME
OL INHIBT TIME
Start Monitoring
START MOTOR TIME
Start-Delta Set
STAR-DELTA ENABL
MAX STAR TIME
Start Inhibt
STARTS/HR.
MIN. OFF TIME
RESTART BLK TIME
Speed Sw Set
SS TRIP DELAY
SS WARN DELAY
PTC Setting
PTC ENABLE
PTC RESET MODE

RTD Settings
RTD ENABLE
RTD RESET MODE
RTD1 LOCATION
RTD1 TYPE
RTD1 TRIP LEVEL
RTD1 WARN LEVEL
RTD2 LOCATION
RTD2 TYPE
RTD2 TRIP LEVEL
RTD2 WARN LEVEL
RTD3 LOCATION
RTD3 TYPE
RTD3 TRIP LEVEL
RTD3 WARN LEVEL
RTD4 LOCATION
RTD4 TYPE
RTD4 TRIP LEVEL
RTD4 WARN LEVEL
RTD5 LOCATION
RTD5 TYPE
RTD5 TRIP LEVEL
RTD5 WARN LEVEL
RTD6 LOCATION
RTD6 TYPE
RTD6 TRIP LEVEL
RTD6 WARN LEVEL
RTD7 LOCATION
RTD7 TYPE
RTD7 TRIP LEVEL
RTD7 WARN LEVEL
RTD8 LOCATION
RTD8 TYPE
RTD8 TRIP LEVEL
RTD8 WARN LEVEL
RTD9 LOCATION
RTD9 TYPE
RTD9 TRIP LEVEL
RTD9 WARN LEVEL
RTD10 LOCATION
RTD10 TYPE
RTD10 TRIP LEVEL
RTD10 WARN LEVEL
RTD11 LOCATION
RTD11 TYPE
RTD11 TRIP LEVEL
RTD11 WARN LEVEL
RTD12 LOCATION
RTD12 TYPE
RTD12 TRIP LEVEL
RTD12 WARN LEVEL
WIND TRIL VOTING
BEAR TRIP VOTING
TMP RTD BIASING?

Figure 19 Main Menu > Show/Set > Relay Cont'd

Relay Cont'd

ESC Steps back one level

Undervoltage Set

Load Control Set

UV TRIP LEVEL
UV TRIP DELAY
UV WARN LEVEL
UV WARN DELAY
Overvoltage Set
OV TRIP LEVEL
OV TRIP DELAY
OV WARN LEVEL
OV WARN DELAY
VAR Setting
NEG VAR TRIP
POS BAR TRIP
VAR TRIP DELAY
NEG VAR WARN LEV
PAS VAR WARN LEV
VAR WARN DELAY
Underpower Set
UP TRIP LEVEL
UP TRIP DELAY
UP WARN LEVEL
UP WARN DELAY
Power Factor Set
PF LAG TRIP LEVEL
PF LD TRIP LEVEL
PF TRIP DELAY
PF LAG WARN LEVEL
PF LD WARN LEVEL
PF WARN DELAY
Freq Settings
FREQ1 TRIP LEVEL
FREQ1 TRIP DELAY
FREQ1 WARN LEVEL
FREQ1 WARN DELAY
FREQ2 TRIP LEVEL
FREQ2 TRIP DELAY
FREQ2 WARN LEVEL
FREQ2 WARN DELAY
Phase Rev Set
PH REV. ENABLE

LOAD CONTROL SEL
LD CTL CUR UPPER
LD CTL CUR LOWER
LD CTL PWR UPPER
LD CTL PWR LOWER
LD CTL TCU UPPER
LC CTL TCU LOWER
I/O Settings
ANALOG OG OUT SEL
Trip Inhibit
CURRENT INBALANC
JAM
GROUND FAULT
SHORT CIRCUIT
UNDERCURRENT
START INHIBIT
PTC
RTD
Relay Behavior
TRIP FAIL-SAFE
AUX1 FAIL-SAFE
AUX2 FAIL-SAFE
AUX3 FAIL-SAFE
AUX4 FAIL-SAFE
AUX5 FAIL-SAFE
AUX6 FAIL-SAFE
Timer Settings
ON DELAY T1
OFF DELAY T1
ON DELAY T2
OFF DELAY T2
Front Panel Set
LCD TIMEOUT
LCD CONTRAST
Display Set
TIME & DATE
GROUND CURRENT
CURRENT IMBALANC
FREQUENCY
THERM CAP USED
VOLTAGE IMBALANC
POWER
RTD TEMPERATURE

Figure 20 Main Menu > Status

Status

ESC Steps back one level

	Definition
FID	Firmware identifier string
CID	Firmware checksum identifier
Identity Code	Relay configuration identification
L1	DC offset in hardware circuits of current channels
L2	
L3	
RES	
CB	
VA	DC offset in hardware circuits of voltage channels
VB	
VC	
PS_Vdc	Power supply status
FPGA	FPGA programming unsuccessful, or FPGA failed
GPSB	General Purpose Serial Bus
HMI	Front-Panel FGPA programming unsuccessful, or Front-Panel FPGA failed
RAM	Volatile memory integrity
ROM	Firmware integrity
CR_RAM	Integrity of settings in RAM and code that runs in RAM
Non_Vol	Integrity of data stored in nonvolatile memory
Clk_Bat	Clock battery integrity
Clock	Clock functionality
PTC	Integrity of PTC
RTD	Integrity of RTD module/communications
MCM/CWE	Integrity of current board and MCM/CWE
Voltage	Integrity of voltage board
I/O_Crd	Integrity of I/O card
Com_Crd	Integrity of DeviceNet card and network
MAC_ID	DevineNet card specific card identification
ASA	Manufacturer identifier for DevieNet
DN_Rate	DeviceNet card network communications data speed
DN_Status	DeviceNet connection and fault status
Relay Enabled	

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