Powerterm LC90/LC90e Control Modules

Model C2155C & C2156C 6Amp 0-15Volt Transformer/Rectifier with Remote Control

DATASHEET

- Control Corrosion using this state-of-the-art Master Control unit
- Two RS232/485 Modbus Interfaces for remote monitoring and control
- 3 highly accurate control modes: Voltage, Current and Reference Potential
- Alarm Output Contact
- Instant Off Control output
- Reference Cell inputs from C6333A MUX Board

Features

- **Two models provide best application fit**
- **Fully isolated dual RS485 communications port**
- **Designed for remote monitoring and control.**
- **Ethernet port on C2156C model**
- **GSM or HSDPA+ option**
- **Wide operating temperature range**
- **Universal 85-264Vac input voltage**
- **DIN Rail mounting with small panel footprint**

OVERVIEW

The Powerterm LC90 and LC90e are universal controllers for use in any Cathodic Protection systems.

Both models can monitor up to 90 references and control up to 480 C2151/C2152 TR's.

Both models can be configured to control constant voltage, constant current, or constant reference potential. All configuration settings can be changed via the serial communications links either from a locally mounted ***PowerView CP Operator Interface Panel***, or remotely using the Omniflex ***Data2Desktop Monitoring Service***.

SERIAL COMPUTER INTERFACE

The LC90 modules have two integrated Modbus RS485 serial ports, a single RS232 serial port and USB port making these products compatible with the latest remote monitoring and control systems. The LC90e models are also equipped with Ethernet port. Links to TR's are electrically isolated from the power circuits thus protecting sensitive computer equipment.

Using the RS485 multi-drop mode of operation up to 11 Powerterm LC90's can be connected to a single Modbus Master communications port (Master + 10 slave modules).

AUTOMATIC REFERENCE CONTROL

Both models include a fully configurable controller for automatic control of Reference potential. The Proportional Gain and Reset constants of the controller can be adjusted for optimum control dependent upon the installation conditions.

Independent Current and Voltage Limit settings ensure that safe operating conditions selected by the user are not exceeded in automatic modes.

HALF_CELL REFERENCE INPUT

The Powerterm LC90 has a high-impedance (>100Mohm) half-cell reference input for monitoring or control purposes.

This reference input is buffered and reference is selected from one of the 15 inputs available on C6333 Multiplexer Board. Up to 6 of these boards can be plugged into the module thus allowing reference voltage monitoring of up to 90 references. Each reference input is relay switched only when reading, minimising the current drain on the cells and ensuring longest life.

ALARM CONTACT

An Alarm contact output can be used to give an independent signal of problems in the cathodic protection system.

ANTENNA INSTALLATION (on some models)

In most applications the GSM network reception at the site of the system should be adequate for reliable communications using the stub antenna supplied with the LC90.

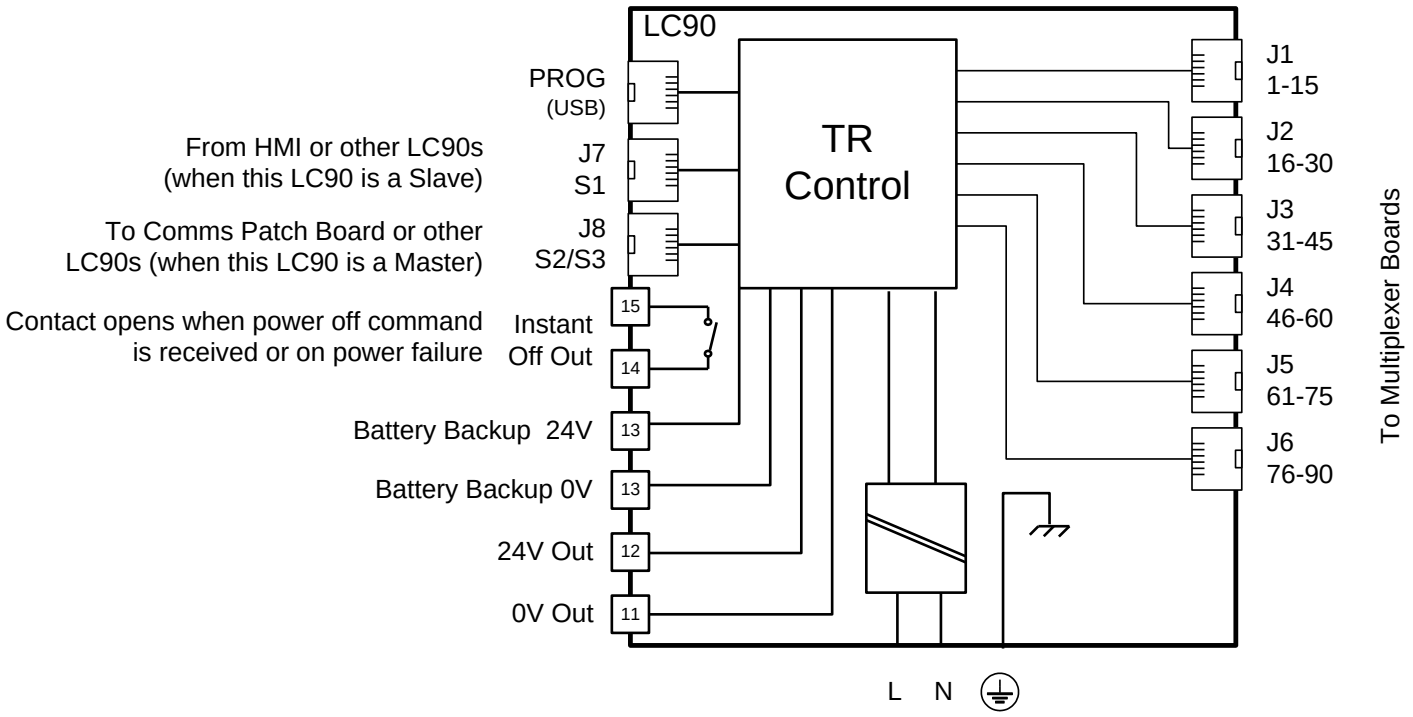
INSTANT OFF OUTPUT

The Powerterm LC90 output can be transmitted over RS485 network to multiple C2152 TR's for "Instant Off" system testing.

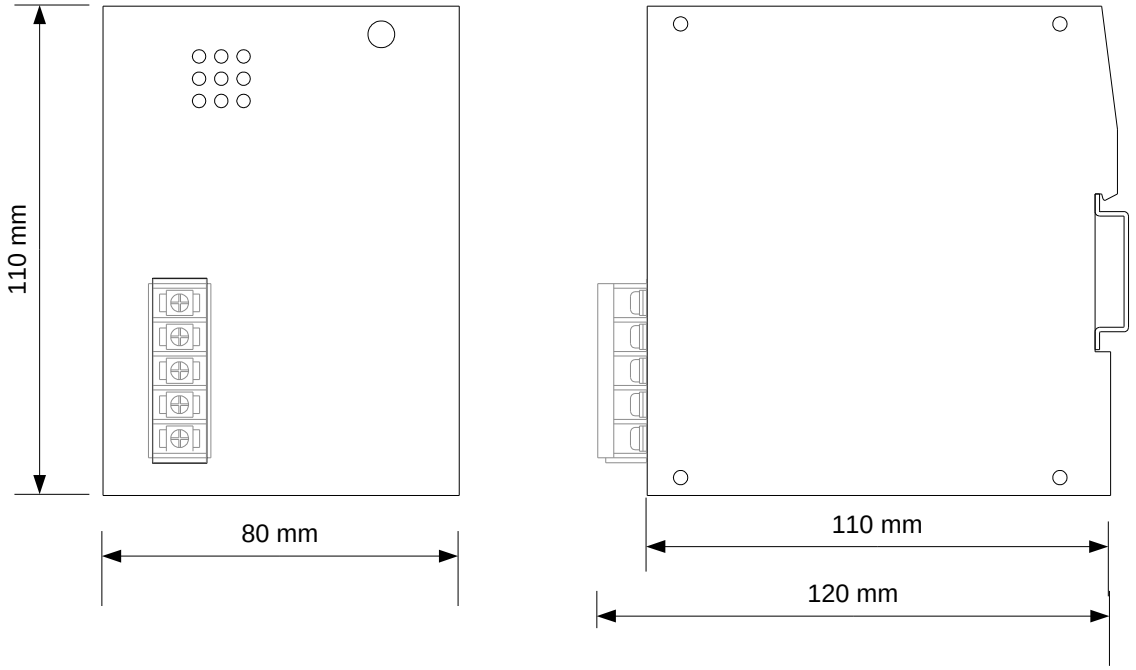
OPERATOR INTERFACE

A range of companion touch screen PowerView CP Operator Interface Panels are available for interacting with up to 32 Powerterm L120P T/R units. All variables can be monitored via this operator interface, and configuration settings can be changed through password protected screens.

Typical Powerterm LC90 System Connection Diagram



Mechanical Details



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Specifications

AC Input

AC input voltage range	85-264Vac
AC input frequency	47-63 Hz
Input current at full load	<0.2A rms at 115Vac <0.1A rms at 230Vac
Switch-on inrush current	6A for <10ms
Surge withstand	2.5kA 8/20us pulse 40 joules max.
Fast Transients	2 kV

DC Ouput (Terminals 5,6)

Output Voltage Range	25.2Vdc typ. with battery backup
Output Current Range	0-1Adc
Maximum Continuous Total Power	12 Watts at 60°C ambient (see derating under Environment)
AC line regulation	0.5% max over 85-132 & 170-264Vac
Load Regulation	2% max over 10-100% of total load
Output Ripple	<250mVpk-pk
Efficiency	>80% at full load

Battery Output (Terminals 3,4)

Operation	boost/float charger
Max. open circuit voltage	27.6V dc
Max. charge current	500mA
Battery cut-off threshold	≥24V Guaranteed ON ≤22.5V Guaranteed OFF

Reference Input (RJ45) from C6333 Only

Input Range (software selectable)	0 to 0.3Volts 0 to 3.0Volts 0 to 30Volts 0 to 60 Volts
Input Impedance (0-2V)	>100MΩ (while powered)
Input Leakage (0-2V)	<2.1nA (while powered)
Input Leakage (0-2V)	<120nA (power removed)
Accuracy	<0.25% at 25°C
Temperature Drift	<200ppm/°C over 0-60°C

OK Output Contact (Terminals 1,2)

Max. open circuit voltage	30V dc
Max. closed circuit current	100mA
Operation	Closed when AC is ON and DC power is healthy. Opens on Alarm Condition (see "Indicator Lights" for Alarm List)

Network Communication Specifications

Model C22155/6C-11 GSM/GPRS Version

Bands	Quad band 850/900/1800/1900 MHz GSM/GPRS
Approvals	GCF-CC, PTCRB, R&TTE (CE), FCC
SIM Card	1.8V/3V SIM compatible

Model C2155/6C-12 GSM/GPRS/EDGE/HSDPA Version

Bands	850/900/1800/1900 MHz GSM/GPRS/EDGE 800/850/900/1900/2100 MHz UMTS/HSPA (WCDMA/FDD) (3G HSPA Compliant)
Approvals	GCF-CC, PTCRB, R&TTE (CE), FCC/IC, A-Tick, JPA, Telstra, NTT DoCoMo, AT&T
SIM Card	1.8V/3V SIM compatible

Indicator Lights

AC (Green)	ON when AC power is ON
DC (Red)	ON when DC Output is ON
CC (Green)	ON when in constant current mode Flashing when out of control
REF (Green)	ON when in constant reference mode Flashing when out of control
ALM (Red)	ON when Alarm is present
Detected Alarms	1. Output out of control 2. Voltage out of preset limits 3. Current out of preset limits 4. Reference out of preset limits 5. Power failure

Environment

Operating Temperature	0°C – 50°C (32°F – 122°F) at full load. derate 3%/°C from 50°C up to 65°C
Storage Temperature	-10°C – 70 °C (+14°F – 158°F)
Design Life at 50°C	50 000 hours

Mechanical

Width	80mm
Height	110mm
Depth	120mm (including terminals)

Weight

Unpacked	534g approx.
Packed	564g approx.

Compliance to Standards

Safety	IEC950; EN60950:1995
Emissions	EN 55011 and EN50081-2:2011 Group I, Class A
Immunity – ESD	IEC 61000-4-2:2008, level 3
Immunity – RF Fields	IEC 61000-4-3:2010, level 3
Immunity – Fast Transients	IEC 61000-4-4:2011 2 kV – AC & DC power ports 1 kV – other input/output lines

Ordering Information

ORDER CODE	DESCRIPTION
C2155C	Powerterm LC90 Control Module
C2155C-11	Powerterm LC90G1 Control Module with GSM option
C2155C-12	Powerterm LC90G1 Control Module with HSPA modem (3G HSPA compliant)
C2156C	Powerterm LC90e Control Module with Ethernet
C2155C-11	Powerterm LC90G1e Control Module with Ethernet and GSM modem
C2156C-12	Powerterm LC90G1e Control Module with Ethernet & HSDPA modem

Typical Application in a Remote Monitored Cathodic Protection System