

CATH-TECH

CORROSION CONTROL EQUIPMENT

Operation Manual for CIM-50S

GPS Synchronized Current Interrupter - SCADA



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Limited Warranty

All Cathodic Technology Limited (Cath-Tech) instruments and equipment are warranted against defects in materials, design or workmanship for a period of two years from date of sale. This warranty excludes damage due to misuse, abuse, tampering or acts of God such as fires, floods, wind damage, lightning etc.

We will repair or replace at our option any defective component, after examination in our manufacturing facility, if the fault is due to defective materials or labour, within two years of the purchase date. For warranty repair, a Returned Goods Authorization (RGA) must be obtained from Cathodic Technology Ltd prior to shipping the defective unit pre-paid to our location.

Note: *There is no warranty expressed or implied on batteries.*

Cath-Tech Policy

- Cath-Tech extends a two-year in use warranty on all units, which have been designed and/or manufactured by Cath-Tech staff.
- Cath-Tech reserves the right to make any changes in design or specification which it deems an improvement, with no liability to make the same changes on existing equipment.
- This warranty is in lieu of all other warranties or guaranties, expressed or implied, which might otherwise exist. The purchaser is relying only upon this guarantee and not upon any representations not herein expressed.
- Any material or equipment being returned to the factory must first have a Returned Goods Authorization (RGA) from Cath-Tech.

Welcome

Thank you for selecting the CIM-50S GPS synchronized current interrupter module. CATH-TECH™ is the world leader in electronic equipment for corrosion control.

The CIM-50S GPS synchronized current interrupter module is equipped with a GPS engine to ensure accurate synchronization with other interrupters no matter how far apart.

The CIM-50S GPS synchronized current interrupter module is a precision instrument. It is designed to interrupt the current flow from the cathodic protection rectifier or sacrificial anode system on a cyclic basis.

Open and inspect the CIM-50S GPS synchronized current interrupter module on receipt. If any damage occurred during shipping, file a claim with the carrier immediately.

It is important to connect the current interrupter into the circuit properly; failure to do so may result in damage to the unit.

Specification

DC Capacity: 50 Amps at 125V DC

AC Capacity 50 Amps at 250V AC

AC Power: 100-240V AC, 0.5A, 50-60Hz

Environmental: IP66 / NEMA 4X case

SCADA Network:

- Control Input: +24 V DC > 100ms pulse
- Coil Resistance: 220 Ω
- Signaling Output: Contact closure 1A 250V AC / 1A 28V DC

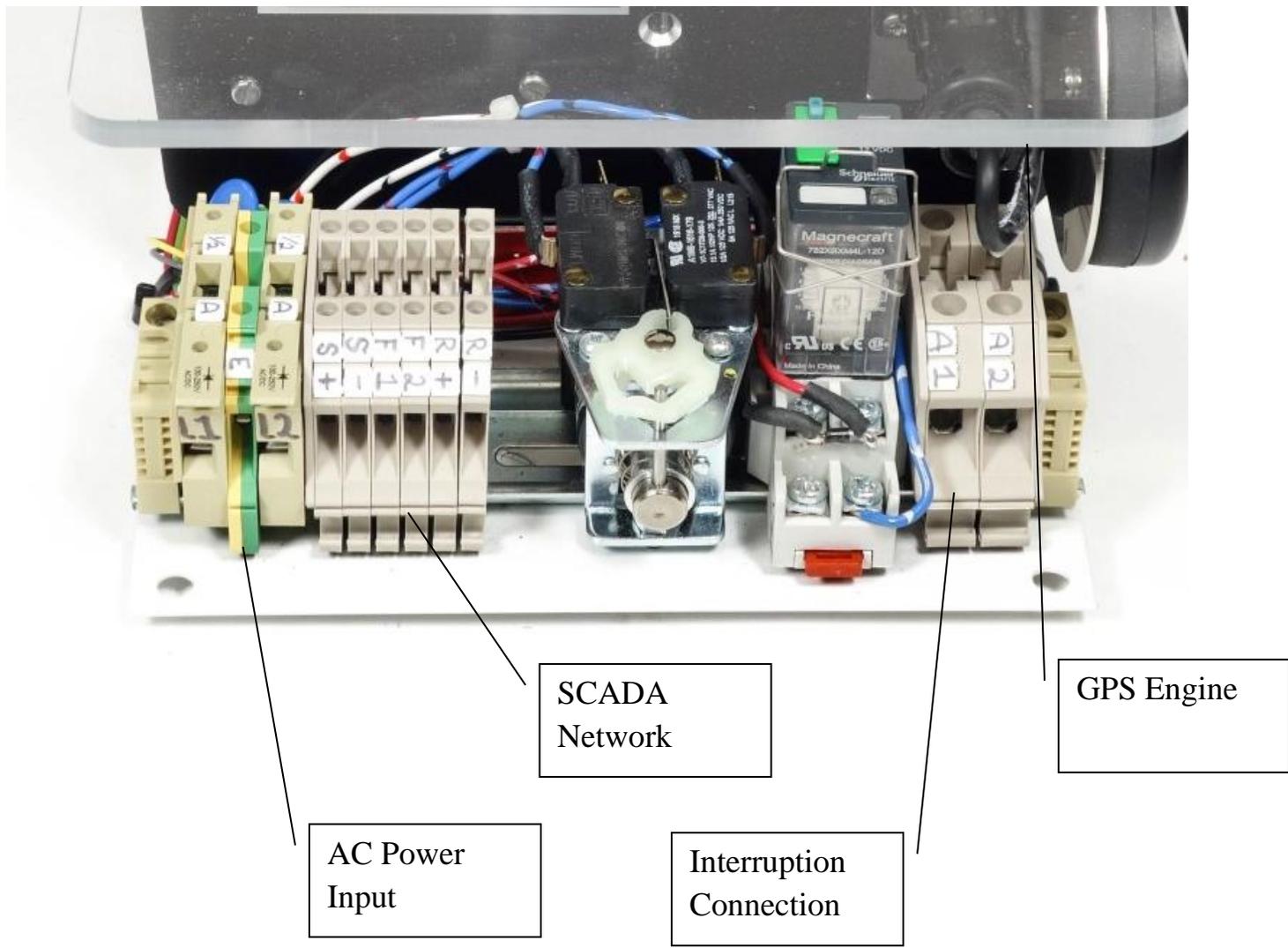
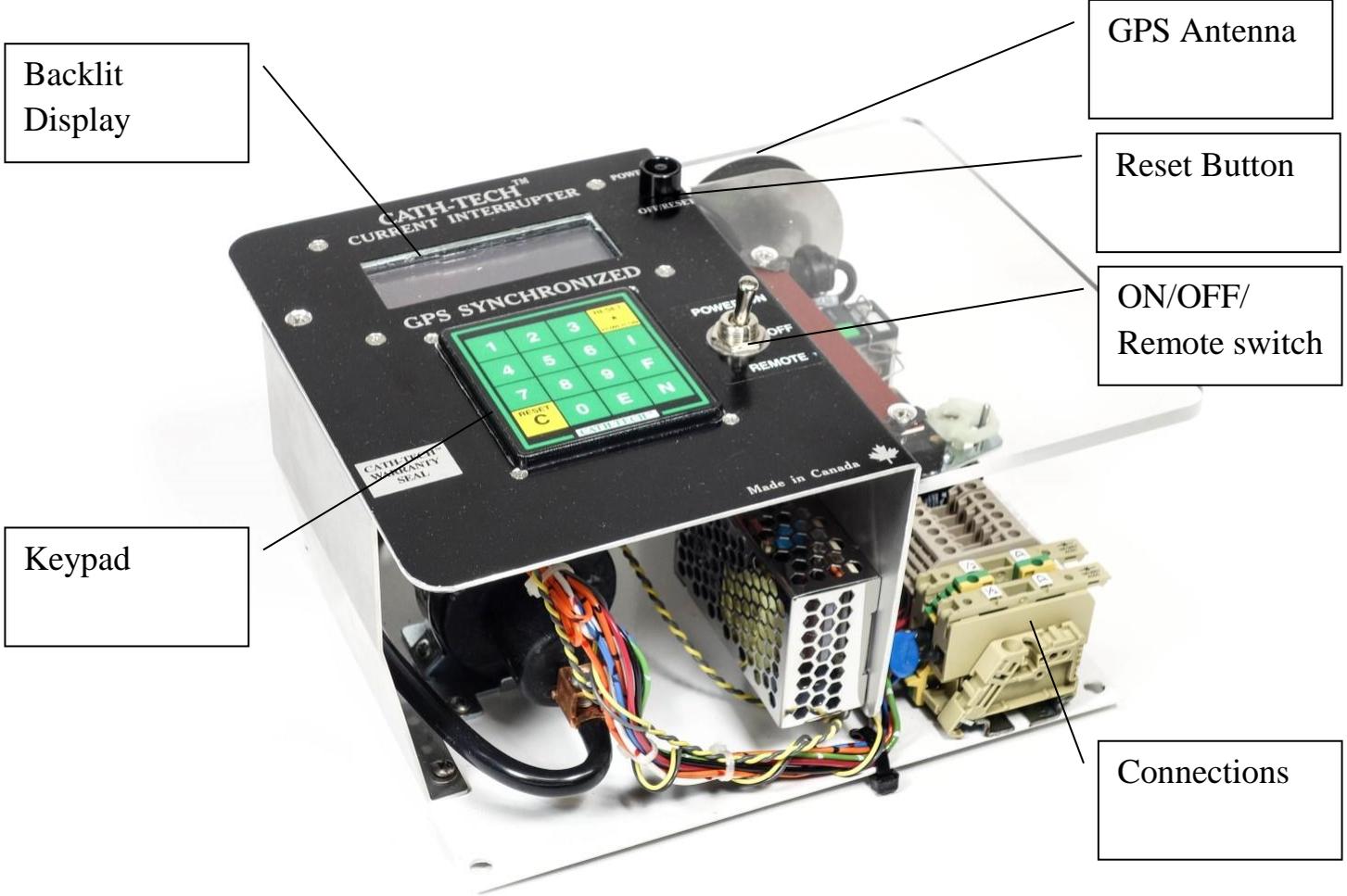
Safety

The installation of the CIM-50S GPS synchronized current interrupter module requires electrical connections in the rectifier. Only personnel who are trained in electrical safety should undertake this.

The CIM-50S can interrupt either DC or AC current. Please observe the following safety precautions when installing the interrupter.

1. Turn the AC supply to the rectifier OFF and verify with a volt meter before making any connections to the rectifier.
2. When interrupting the DC output of the rectifier, ensure that the incoming power is off before making a connection. Connect the interrupter in series with either the anode or the pipe output from the transformer.
3. When interrupting the AC input of the rectifier, ensure that the incoming power is off before making a connection. Connect the interrupter in series with one of the incoming AC lines using the AC interruption cable provided. This interrupter is only capable of interrupting single phase AC, not three phase.

Features



Installation

The CIM-50S is designed to mount on the side of a rectifier cabinet as a permanent installation. The door should swing up out of the way so that the user can look at the main control panel. The arrows on the side of the case must be pointing up. Failure to mount the unit properly may result in damage to the unit.

Holes must be drilled in the module's case and the rectifier cabinet to allow for the installation of the electrical conduit. Glands, conduit and an L have been provided. All wiring should be run in conduit to protect it from the weather and to prevent animals or humans from accidentally coming into contact with the wires.

This module has a built in mechanical relay for interrupting the current. No external relay is required.

There are three different connections that need to be made:

AC Power

A single phase AC power input is required to provide power to the CIM-50S. A range of 100V to 240V at either 50 or 60 Hz is acceptable. Connect the live, neutral and ground wires to the L1, L2 & E, terminals provided

Network

Two SCADA network connections are required to operate the unit remotely. One provides a signal to turn the unit on or off, the second provides feedback that the unit is powered up.

The six terminals perform the following functions:

S+	SCADA Control Input
S-	- 24V DC pulse toggles the AC power on and off
F1	SCADA Signalling Output
F2	- Closed if CI is powered up
R+	External Relay
R-	- Output 12V DC at 1A to power an external nc relay

Rectifier

Always turn the rectifier OFF and check with a meter before performing any work inside the rectifier case. This should only be done by trained personnel following the company's safety policies. Follow the company procedures for rectifier access.

Terminals A1 and A2 are to be connected in series with the circuit to be interrupted.

DC Output:

To connect to the output side of a rectifier, first turn OFF the rectifier and the CIM-50S. Then connect the CIM-50S in series with either the anode or the pipe output from the transformer.

AC Input

The CIM-50S is capable of interrupting the AC input to the rectifier. The CIM-50S can only interrupt one line of AC input. Disconnect one AC supply wire and hook up the CIM-50S in series in the supply.

GPS (Global Positioning System)

The GPS antenna is integral to the CIM-50S box. The module should be mounted so that the top of the box has an unobstructed view of the sky. When the GPS engine has acquired the minimum number of satellites and it has calculated its position the UTC time and location will be shown on the screen.

Setup

To turn the unit on, provide power to the unit. Then press the * key on the keypad or the reset button. As the unit activates, the following message will appear on the screen:

```
CATHODIC TECHNOLOGY
2 VIII 2006 V127mH
```

The second line indicates the version of firmware currently installed. After a short delay, the main menu will be displayed.

Main Menu

The main menu allows the user to program the unit to operate. If there is no user input after 20 seconds, the unit will go into operation and run whatever programs it currently has stored. The options on the main menu are as follows;

```
CATHODIC TECHNOLOGY
E-program I-off
0-RS232
C-GPS-power  GPS ON
```

- | | |
|-------------|---|
| E-program | This allows the user to see and change the programs currently in the current interrupter's memory. |
| C-GPS-power | This option turns the GPS power on and off. For GPS synchronized surveys, GPS power must be on. |
| 0-RS232 | This allows the user to set up computer communications with the unit. |
| I-off | This option turns the unit off. DO NOT USE THIS OPTION. Use the power switch to control power to the unit. |

At any time the user may return to the main menu by pressing the reset button or press both yellow keys simultaneously.

E-program

Prior to using the current interrupter, the unit must be programmed with the desired current interruption cycle. From the main menu screen, press E to access the programming mode.

OFF Time

```
0200 ms off
C-change N-ok
```

The first screen prompts for the OFF Time.

To change this value press C and enter a 4 digit off time in ms. 1 second = 1000 ms.

Always enter all four digits, e.g. 0 2 0 0.

If less than four digits are entered the value will be interpreted incorrectly.

Once the value has been entered correctly, press N to move on.

Cycle Time

The next screen prompts for the cycle time.

```
0200 ms off
01 s
C-change N-ok
```

The cycle time is the total time of the interruption cycle:

$$\text{OFF TIME} + \text{ON TIME} = \text{CYCLE TIME}$$

Some standard cycle values are:

Off Time	Cycle Time	
200 ms	1 sec	This results in 800 ms on
400 ms	2 sec	This results in 1.6 seconds on
1 sec	4 sec	This results in 3 seconds on

The current interrupter has pre programmed cycles ranging from ¼ second to 6 minutes. Press C to cycle through the options. The available cycles are:

¼, ½, 1, 2, 3, 4, 5, 6, 10, 12, 15, 20 and 30 seconds, 1, 2, 3, 4, 5 and 6 minutes

The cycle time should always be greater than the OFF time.

Once the correct value has been selected, press N to move on.

Start Time

The next screen prompts for the starting time of interruption. The value is entered in a 24 hour clock format. i.e. 2pm = 1400 hours.

```
1030 from
hhmm
C-change N-ok
program 1
```

All times in the current interrupter are in Coordinated Universal Time (UTC). You must calculate the start and stop times by adding or subtracting the local time as appropriate.

Press C to change the starting time and enter the new time in hours and minutes.

Once the value has been entered correctly, press N to move on.

Stop Time

The next screen prompts for the ending time of interruption. The value is entered in a 24 hour clock format. i.e. 2pm = 1400 hours.

```
1950 to
hhmm
C-change N-ok
program 1
```

All times in the current interrupter are in Coordinated Universal Time (UTC). You must calculate the start and stop times by adding or subtracting the local time as appropriate.

Press C to change the starting time and enter the new time in hours and minutes.

Once the value has been entered correctly, press N to move on.

Start Date

The next screen asks for the starting date of interruption. The value is entered in 4 digits representing the month and day.

Press C to change the starting time and enter the new date in month and day.

Once the value has been entered correctly, press N to move on.

```
0101 from
mmdd
C-change N-ok
program 1
```

End Date

The next screen asks for the ending date of interruption. The value is entered in 4 digits representing the month and day.

Press C to change the starting time and enter the new date in month and day.

Once the value has been entered correctly, press N to move on.

```
1231 to
mmdd
C-change N-ok
program 1
```

Additional Programs

Once the first program is complete, the unit asks if there are any additional programs to be entered.

```
more programs? N F-Y
```

For example, one can use program 1 to have the CIM-50S interrupt Monday to Friday, 7am to 7pm and program 2 to have the CIM-50S interrupt Monday to Friday the following week.

Press F to enter another program or press N to exit the programming mode and return to the main menu.

C-GPS-power

On the main menu the GPS function can be turned on or off by pressing C. GPS must be on for synchronization with other interrupters and survey equipment to occur.

If the GPS is turned off, the main menu is changed and an option to manually set the time is visible.

```
CATHODIC TECHNOLOGY
E-program I-off
0-RS232 N-time
C-GPS-power GPS OFF
```

N-TIME

Use this option to manually set the desired date and time for the unit, (only when GPS is off).

```
yymmddhhmmss
```

The date and time is entered as one long numerical string with two digits for the year, month, day, hour, minute and second. Once programmed, the internal clock will keep track. After the date and time have been successfully programmed, it will be shown on the main menu.

```
13:07:52 12/12/10
E-program I-off
0-RS232 N-time
C-GPS-power GPS OFF
```

0-RS232

This option is no longer used.

Operation

The CIM-50S has two different modes of operation. Using the switch on the front panel, either local or remote, (SCADA), control of the power supply may be selected.

When the CIM-50S is initially powered up, the main menu is displayed. If there is no user input then the unit will switch to run mode after 20 seconds. The menu is obscured briefly by a series of boxes as the unit switches to run mode.

Once in run mode, the unit attempts to acquire the GPS. Initially the screen will display “GPS NOT LOCKED” and the CIM-50S will not interrupt.

After the CIM-50S unit acquires the GPS it will display “GPS LOCKED” with some additional information.

```

■■■■■■■■■■ C TECHNOLOGY
E-program I-off
0-RS232
C-GPS-power  GPS ON
  
```

```

00:00:00UTC 00/00/00
GPS NOT LOCKED

program 1
  
```

```

15:11:06UTC 12/12/10
GPS      LOCKED
4351.642N 07942.900W
program 1 ■■■■
  
```

If GPS is on, the CIM-50S must be initially locked before any of the scheduled programs can be activated. A minimum of 4 satellites are required for lock. On the bottom line of the LCD the program number that is currently effective is shown along with two boxes; The first box indicates that the program is activated. The second box flashes approximately in time with the interruption cycle.

If only one block appears, check the programming, the interruption cycle time may not be active at the moment. If the blocks do not appear (or the program number keeps changing) then a valid program hasn't been entered. See the Programming section and enter a valid program.

When the program is not interrupting the rectifier, the output is held ON to minimize depolarization of the cathodic protection levels.

If the GPS is off, the operations screen is slightly different.

If in this case, the time and date is showing all zero's without changing, then return to the main menu and re-enter the date and time.

```

15:11:06UTC 12/12/10

program 1 ■■■■
  
```

Remote Operation

The CIM-50S is designed to work with a SCADA system for remote control.

When the power switch is set for remote operation, a +24V DC pulse at the S+ and S- terminals will cycle the CIM-50S power supply on or off.

When the CIM-50S power is on the F1 and F2 terminals will be shorted.

When the CIM-50S power is off the F1 and F2 terminals will be open.

Allow a few minutes for the unit to acquire the GPS and begin interrupting, prior to commencing a survey.

Maintenance

There are very few user serviceable parts on the CIM-50S. If the unit does not interrupt;

- Check the program; it may not be programmed to interrupt that day. Remember that all times are in UTC, so calculate the local time using the time zone information.
- Check the mode of operation, the interrupter must be set to ON or REMOTE operation. If REMOTE, check the SCADA network to ensure that the proper signal was sent.

For other problems, please contact Cathodic Technology at ++1-905-857-1050 or ctl@cath-tech.com.

Spare Parts

Below is a list of spare or replacement parts available for the CIM-50S from Cathodic Technology. Most parts are in stock and can ship in 2 business days.

CTL-310

GPS 18X,
short lead



CTL-553

DC / AC
Relay



CTL-541

Keypad for
CI



CTL-608

Main
Control
Card

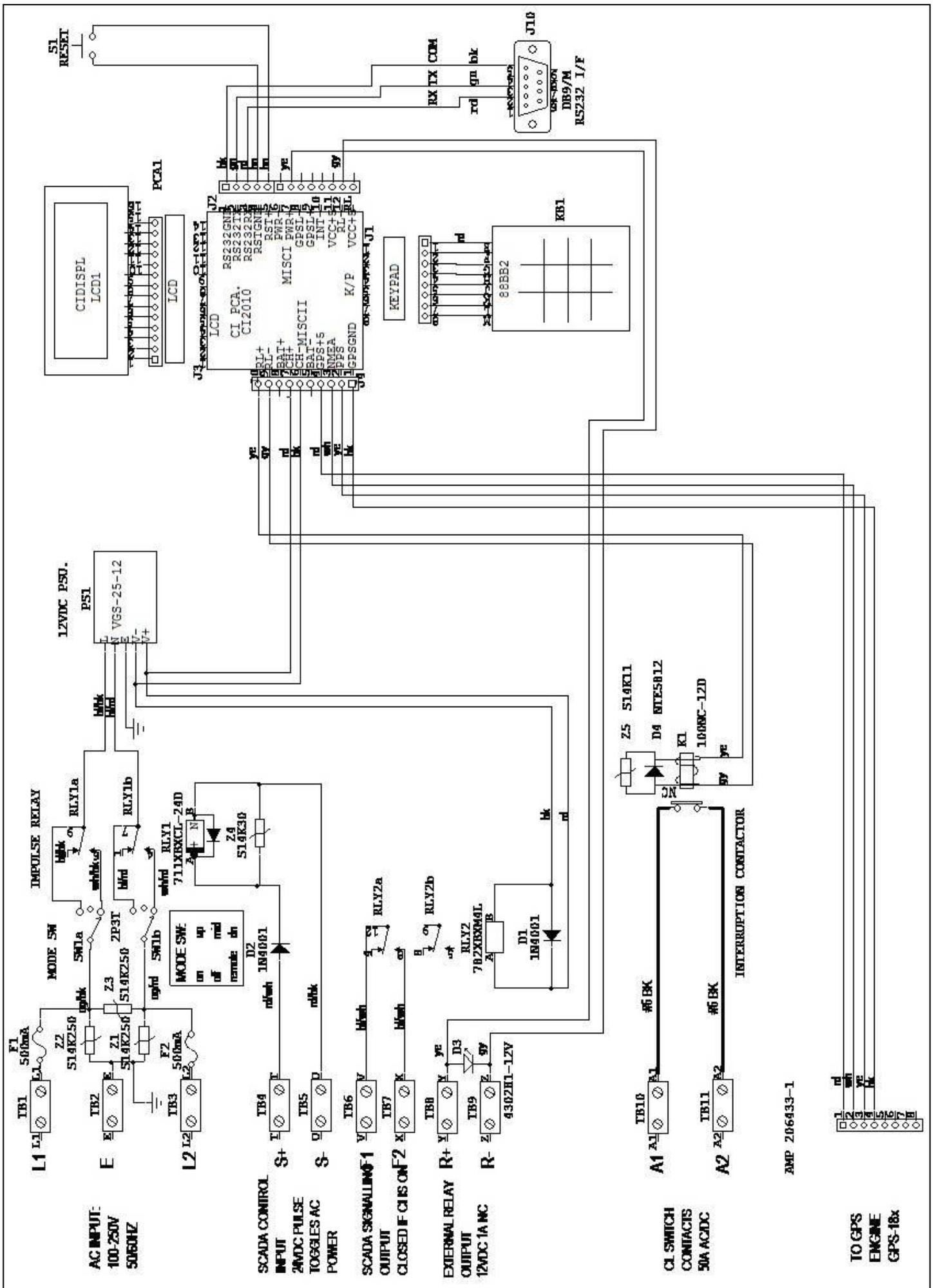


CTL-543

Backlit
LCD
display



Schematic





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