

Corrosion Electronics

GT100 Interrupt Timer Operating Manual

Introduction

The GT100 Interrupt timer is intended to provide a means of interrupting the output of a transformer rectifier within a cathodic protection installation. The GT100 has a built –in GPS receiver which provides a high accuracy time-clock for synchronisation purposes. Alongside the GPS receiver is a highly accurate on-board Real Time Clock (RTC) which features a temperature compensated crystal oscillator for minimising temperature drift. The on-board RTC is updated with the GPS information once every second and will automatically take over as the primary clock source if the GPS signal is ever lost. The primary clock source can transition from GPS to RTC seamlessly and without error of any kind.

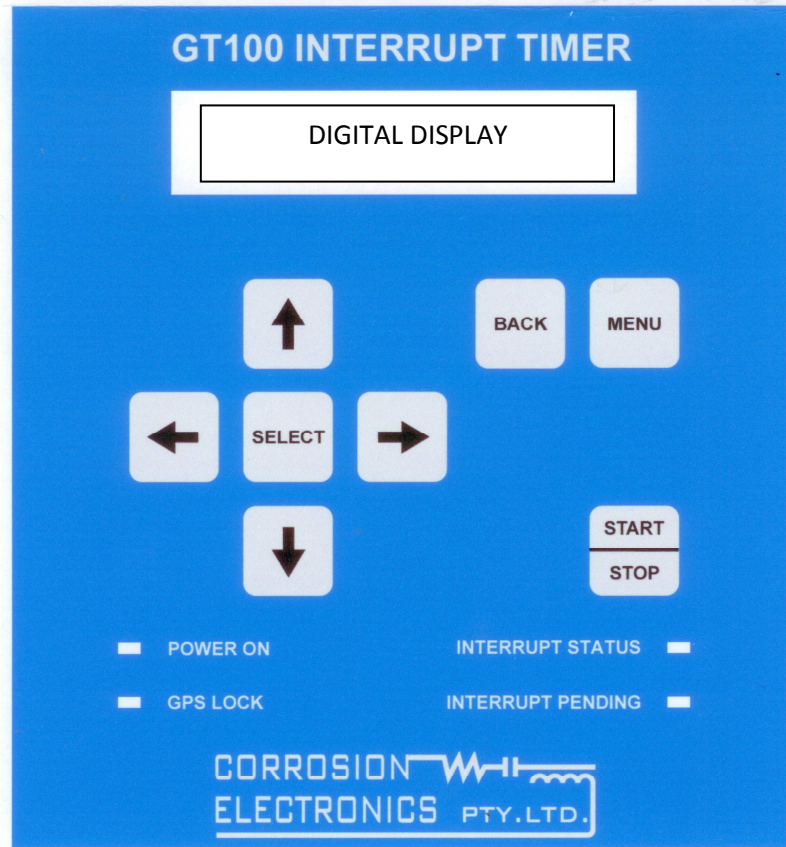
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NOTE: AT START UP, THE “GPS LOCK” LED INDICATOR MAY TAKE A COUPLE OF MINUTES TO RESPOND TO A SATELLITE SIGNAL BEING RECEIVED. THE DISPLAY WILL ALSO DISPLAY “GPS” IN PLACE OF “RTC”.

IF THE GPS ANTENNA IS LOCATED WITHIN THE CUBICLE AND WITH THE FRONT DOOR OPEN, THERE SHOULD BE ENOUGH GPS SIGNAL TO LOCK ON TO THE SATELLITE. IF NOT, SIMPLY PLACE IT ON THE TOP OF THE CUBICLE AND WITHIN 2-3 MINUTES THE GT100 TIMER WILL “ LOCK ON” AND UPDATE THE RTC DATE AND TIME. THE ANTENNA CAN BE THEN PLACED BACK INTO THE CUBICLE AND THE REAL TIME CLOCK WILL TAKE OVER THE TIMING.

FOR APPLICATIONS WHERE THE INTERRUPTION IS INITIATED REMOTELY, THE GPS ANTENNA MUST BE IN CLEAR VIEW OF THE SATELLITES AT ALL TIMES. WE SUPPLY A IP67 RATED ANTENNA EITHER ATTACHED TO THE TOP OF THE CUBICLE OR WITH A 10 METRE CABLE SO THE ANTENNA CAN BE MOUNTED REMOTELY FROM THE CPU



The GT100 user interface

The GT100 user interface consists of the following:

16x2 LCD Display

Out of menu mode, the LCD display will show the current time/date and whether the time/date is powered by the GPS (GPS) or the internal real time clock (RTC).

4 LED indicators

POWER ON LED	Indicates power is supplied to the interrupt timer.
GPS LOCK LED	Indicates a GPS signal has been found. Note: The top left of the LCD display should also display 'GPS' to confirm that the GPS clock is being utilised by the interrupt timer.

INTERRUPT STATUS LED	<p>The interrupt status LED is used to indicate the following functions:</p> <p>LED energised An interrupt cycle is active and that the 'OFF' period is in effect. i.e. The TR output current is zero.</p> <p>LED de-energised The transformer rectifier is outputting normally.</p> <p>LED flickering The LED flickering once every second indicates that an Interrupt cycle is active and that the 'ON' period is in effect.</p>
INTERRUPT PENDING LED	An energised interrupt pending LED indicates that there are future interrupt cycles programmed into the schedule.

8 push-buttons

ARROW LEFT/RIGHT	Used to navigate through menu options or to select which parameter to adjust. (flashing parameter)
ARROW UP/DOWN	Used to adjust the selected (flashing) parameter.
SELECT	Used to enter into particular menu option or to accept a menu setting.
MENU	Used to enter/exit the menu.
BACK	Used to navigate out of a menu option.
START/STOP	Used to start/stop A local interrupt cycle.

2. Starting an interrupt cycle

The GT100 interrupt timer allows an interrupt cycle to be started via 3 different methods, these methods are:

2.1 Using the START/STOP button

The local Start/Stop button is used to locally start and stop an interrupt cycle. The start/stop button will only start an interrupt cycle if:

- a) There are no scheduled interrupts pending. This will be indicated by the "Interrupt pending LED"
- b) Remote contacts are in the open state.

The local start/stop On/Off duration is pre-settable within the 'Set Default On/Off Duration' section of the menu.

1. Press the start button
2. The "Interrupt Pending LED" will energise
3. The Interrupt cycle will commence at the turn of the next minute

2.2 Scheduling an interrupt cycle.

Up to 8 schedule entries can be programmed in locally.

Each schedule entry consists of:

- a) A Start Time/Date
- b) A Stop Time/Date.
- c) An On Duration.
- d) An Off Duration.

Schedule entries are automatically cleared when completed or can be cleared from within the 'Clear Schedule Entry' section of the Menu.

2.3 Remotely triggering an interrupt cycle.

Remotely triggering an interrupt by closing a set of clean contacts will allow an interrupt cycle to commence on the turn of the next minute and will:

- Automatically clear any schedule entries
- Stops any active interrupt cycles
- Disable the local start/stop button from starting an interrupt

The timer will continue interruption until the remote contacts open.

The remote interrupt On/Off durations are pre-settable within the 'Set Default On/Off Duration' section of the menu.

3. Using the Menu

The GT100 interrupt timer contains a menu which is accessible by pressing the Menu key. The following menu options are available:

- a) Set Default On/Off Durations.
- b) Schedule New Interrupt Cycle
- c) View Scheduled Interrupt Cycles
- d) Clear Scheduled Interrupt Cycles
- e) Set Clock Time/Date.
- f) Set Cycle Start Configuration. (On-first or Off-first)

- g) Set GPS UTC offset (Time Zone information)
- h) View GPS Data. (GPS Quality, Num of Satellites, Latitude/Longitude)

3.1 Set Default On/Off Durations

The Default On/Off durations can be set anywhere from 0.1 seconds to 100 hours, this allows for anything from fast switching (DCVG) to depolarisation surveys. The default on/off durations apply to both the Local start/stop function (pressing the start/stop button) and the remote mode of operation (contact closure of the remote contacts at the timer module).

3.2 Schedule New Interrupt Cycle

A schedule entry can be used to start an interrupt cycle at any specified time in the future. Up to 8 different schedule entries can be set at any given time. Once a schedule entry has been carried out, it will automatically be deleted from the schedule.

Validity checks are carried out when defining a new schedule to ensure that time/date information is valid and in the future and that there is no clashing with other pre-defined schedule entries.

Each Schedule entry consists of the following:

- a) Set Start Date
- b) Set Start Time
- c) Set Stop Date
- d) Set Stop Time
- e) Set On Duration
- f) Set Off Duration

3.3 View Scheduled Interrupt Cycles

Once scheduled interrupt cycles have been defined they can easily be viewed by selecting 'View Scheduled Interrupt Cycles' from the menu. The details of each scheduled interrupt cycles are viewable in order of Start Time/Date.

3.4 Clear Scheduled Interrupt Cycles

Any pre-defined Schedule entry can be erased from the schedule by using this menu option. If the schedule entry to be cleared is currently being executed the interrupt cycle will be stopped and the schedule entry will be deleted.

3.5 Set Clock Time/Date

This menu option is really only useful to those not using GPS synchronisation. Entering this menu option allows the user to update the onboard real time clock to any specified Date/Time.

3.5.1 Setting the RTC time without synchronisation

- 1) Select the menu option 'Set Clock Time/Date'
- 2) Enter in a new Time/Date then press SELECT
- 3) Select NO to 'Wait for external sync' then press select to continue
- 4) Press select to accept new time.

3.5.2 Setting the RTC time with synchronisation between 2 GT100 Modules

- 1) Connect RTC sync interconnect cable between 2 GT100 Modules
- 1) Select the menu option 'Set Clock Time/Date' on the slave module
- 2) Enter in a new Time/Date then press SELECT (make sure seconds = 0)
- 3) Select YES to 'Wait for external sync' then press select to continue
- 4) On the turn of the next minute on the master module, the slave module will become synchronised to the master module with the pre-programmed time.

3.6 Set Cycle Start Configuration

The Cycle Start Configuration option found in the menu allows the user to define whether an interrupt cycle commences with on OFF period or an ON period.

3.7 Set GPS UTC Offset

The UTC offset is applied to the time received from the GPS satellite information in order to provide a correct 'local' time. To account for daylight savings, you may want to add an extra hour to the UTC offset. The UTC offset is adjustable from -12 Hrs to +13 Hrs in increments of 30 mins.

3.8 View GPS Data

This section of the menu enables GPS tracking information to be viewed on the LCD display, such information includes:

- 1) GPS Quality Indicator

A number which represents the condition of the condition GPS signal where:

0 = NO GPS

1 = GPS OK

2 = DGPS (GPS STILL OK)

- 2) Number of Satellites being received
- 3) Latitude details
- 4) Longitude details

4. Specifications

Input Supply	7-32 VDC
Connections	Input Supply + Input Supply - Remote Trigger Contact 1 Remote Trigger Contact 2 External Relay 0V connection (Source) External Relay COIL- Connection (Drain) On-board Relay COM On-board Relay NO On-board Relay NC GPS Antenna Socket – SMA Socket
GPS Clock Accuracy	25 nS
GPS Acquisition Time	Cold Start: 38 seconds 50% Warm Start: 35 seconds 50% Hot Start: < 2 seconds 50%
Interrupt Triggering Modes	Instantaneous Start/Stop – Button Trigger Scheduled Interrupt Trigger Remote Interrupt Trigger
Real Time Clock Accuracy	Accuracy ± 2 ppm from 0°C to +40°C Accuracy ± 3.5 ppm from -40°C to +85°C