

Eltek TU1023 - GenII GD90A Energy monitor (NDRail350) transmitter user instructions



The GD90A is part of the Eltek GenII family of transmitters.

When used with the NDRail350 energy monitor and appropriate current transformers, the GD90A provides comprehensive monitoring and patterns of use of a three phase supply. The system is ideal for retro fit energy monitoring. The GD90A can be used along side all other GenII transmitter types.

The system comprises:

- GD90A transmitter
- NDRail350 (1 x three phase load meter)
- NDMeter CTs
- DSP10-12 DIN rail mounting power supply to power the GD90A

All components can be supplied by Eltek.

The GD90A has an input for 1 x NDRail350 energy monitor (Modbus RS485).

Note: NDRail310 can also be used but not all parameters can be realised on the GD90A channel assignment - refer to page 2.

The NDRail350 has an input for 1 x three phase load:

- 3 x CT (AC333mV)
- 3 x AC230V nominal
- 1 x AC230 nominal to power the unit





Parameters measured are 3 x voltage, 3 x current, 3 x power factor ($\cos\phi$), kWh and kvarh.

GD90A channel assignment

Channels can be presented at the RX250AL together with those from any other GenII transmitter and can be reordered during TX Setup or when configuring the RX250AL. Channels can only be renamed when configuring the RX250AL with Darca software. Note: RX250AL channels are numbers 1 through 247. GD90A channels are labelled A through L.

| GD90A Channel | Phase/Range | Resolution | Function in Darca |
|---------------|--------------------|------------|-------------------|
| A | V1 0-500VAC | 0.1 | Voltage |
| B | V2 0-500VAC | 0.1 | Voltage |
| C | V3 0-500VAC | 0.1 | Voltage |
| D | I1 0-1000A | 0.1 | Current |
| E | I2 0-1000A | 0.1 | Current |
| F | I3 0-1000A | 0.1 | Current |
| G | P1 0-1 | 0.01 | Power factor (PF) |
| H | P2 0-1 | 0.01 | Power factor (PF) |
| I | P3 0-1 | 0.01 | Power Factor (PF) |
| J | 65000 | | Pulse count kWh |
| K | 65000 | | Pulse count kvarh |
| L | Ext power to GD90A | 1 | State |

CTs that can be used with the NDRail350 (all AC333mV output at range)

| Type | Range | Size mm | Cable dia | CT open | CT closed |
|-------------------------------------|----------------------------|--|----------------------|---|--|
| SCL8-5 SCL16-50 SCL16-100 | 0-5A 0-50A 0-100A | 43 x 37 x 32 51 x 45 x 27 51 x 45 x 27 | 8mm 16mm 16mm |  |  |
| SCT19-150 SCT32-400 SCT51-800 | 0-150A 0-400A 0-800A | 51 x 53 x 17 82.5 x 85 x 27 121 x 127 x 32 | 19mm 32mm 51mm |  |  |

Other SCT19 models available: 5, 10, 15, 20, 30, 50, 70 and 100A - refer Eltek

Other SCT32 models available: 70, 100, 150, 200, 250, 300, 400 and 600A - refer Eltek

Other SCT51 models available: 600, 1000A - refer Eltek

SCL can be operated at range x 1.21 continuously

SCT can be operated at range x 1.31 continuously

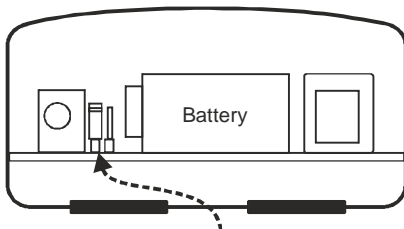
Important note

CTs have a moulded arrow impressed on the case. The CT must be mounted on the power cable so that the arrow points to the load!

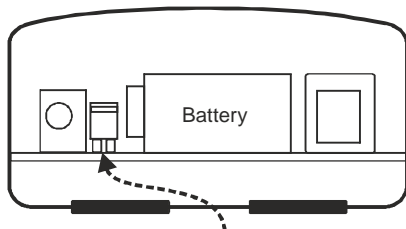
CT wiring: Black is positive, white is negative.

GD90A Links

The transmitter contains a rechargeable battery to maintain the GD90A operational should the AC supply fail. For despatch the battery is disconnected (to prevent total discharge). To connect the battery when received, remove the two bottom cover retaining screws to reveal:



Shipping:
The red link is installed as shown..



To commission:
Remove the red link and install as above

GD90A Notes

Method of operation

GD90A reads and stores the values from the NDRail350 meter every 10 seconds. 18 sets of values are stored and each newest set of values replaces the oldest. At each transmission the GD90A transmits the average of the 18 values for voltage, current or power factor. A transmission is randomised within the set TX interval. The default TX interval is preset to 5 minutes.

Battery charging, recovery and endurance

The PCB mounted 150mAh 6V NiMH battery is charged at approximately 4mA. A fully discharged battery requires 36 hours charge to reach 80% capacity. The TX is fully functional if the battery is discharged when external power is applied. A charged battery can provide 24 hours standby should the AC supply fail. Settings are not lost if the battery is fully discharged. The battery is PCB mounted. Should replacement be necessary, the transmitter must be returned to Eltek or our approved distributor.

External power required is 12VDC regulated. The preferred power supply is the type DSP10-12, this DIN rail mounting power supply is provided with screw down connections for ease of installation. The max demand current from the external power supply is 50mA.

Indicators and concealed push switch

The push switch is located behind a small access hole located at the rear of the transmitter. To activate the switch a small screwdriver or unfurled paper clip can be used.

(When initially powered the transmitter is displayed for 5 seconds)


Red LED cadence due to activation of the concealed push switch:

| Function | Activate switch for | LED cadence | LCD |
|---|---------------------|-------------------------------------|---|
| Tx disable | 5 seconds | 5 x fast flashes | After 5 seconds displays OFF |
| Tx enable (when configured) | 5 seconds | 1 continuous 5 sec flash | After 5 seconds displays sensor information |
| Test transmissions approximately every 5 sec for 2 minutes. | 2 second | Short flash at time of transmission | No change |

Red LED (D5) due to GD90A being configured or not configured:

| GD90A condition | LED | Note | LCD |
|----------------------|---------------------------------------|---|------------------------------|
| GD90A not configured | "Blink" every 8 seconds | | Battery gauge displayed only |
| GD90A configured | Short flash at time of a transmission | A transmission occurs at a random time within the set TX interval | See Display below |

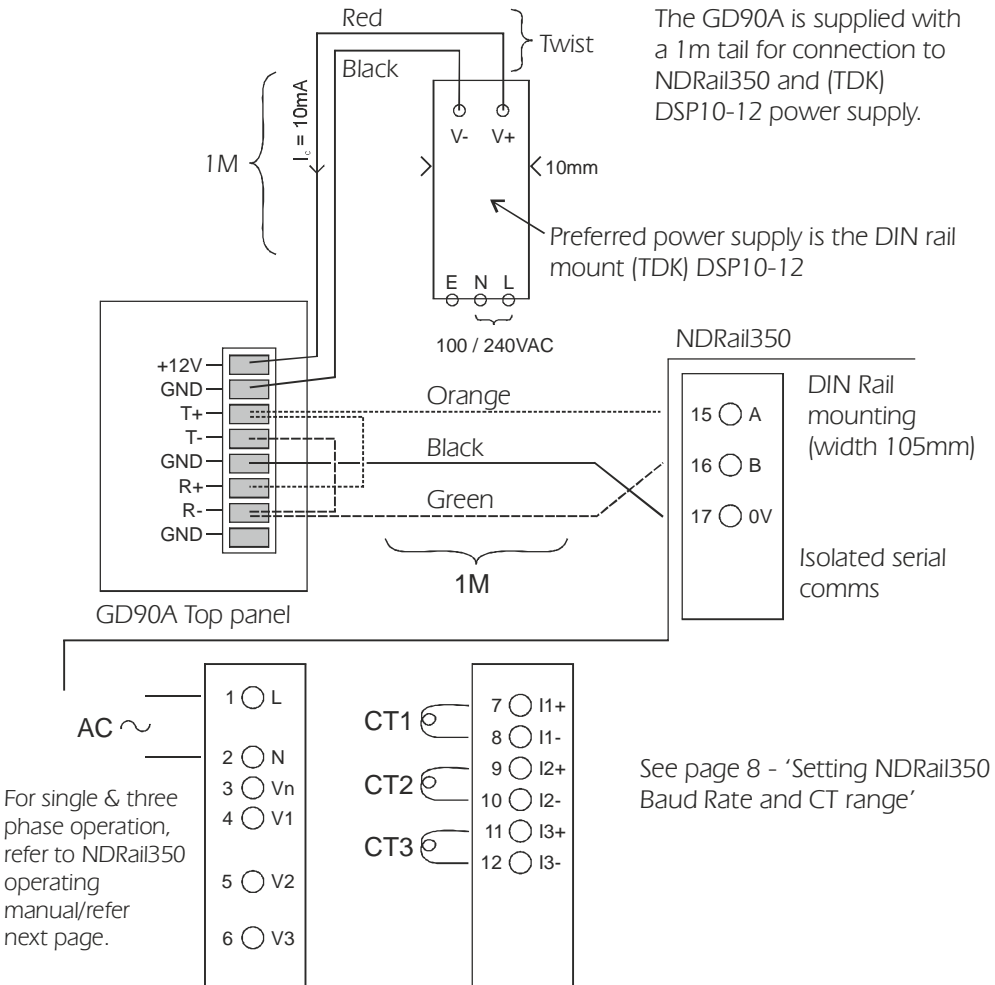
LCD

The LCD includes a battery condition gauge active at all times:  (Battery gauge will flash if battery discharge imminent). Only configured channels are displayed. The LCD scrolls through the configured channel values.

If channels A-K are configured but the NDRail350 is not connected or communications have failed, the display will read *OPEN*. If channel L is configured, this display will read 0 if no external supply is connected or 1 if external 12VDC is connected.

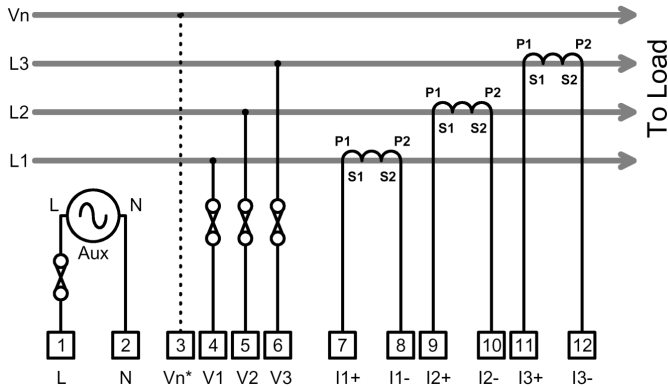
Note: If the GD90A is to be stored or will not be connected to a charging source for more than 48 hours, the GB90A should be disabled (put into hibernate mode, i.e. TX disable mode) to prevent total battery drain and possible loss of settings. Press the concealed push for 5 seconds. The LCD will now read *OFF*.

Connecting the GD90A, NDRail350, CTs and (TDK) DSP 10-12 power supply:



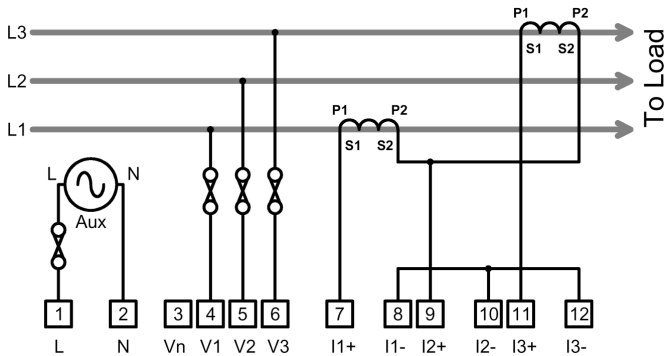
Note: Wire CT black to I1+ and white to I1- etc.
Connect only CTs with the same range value!

NDRail350 connections

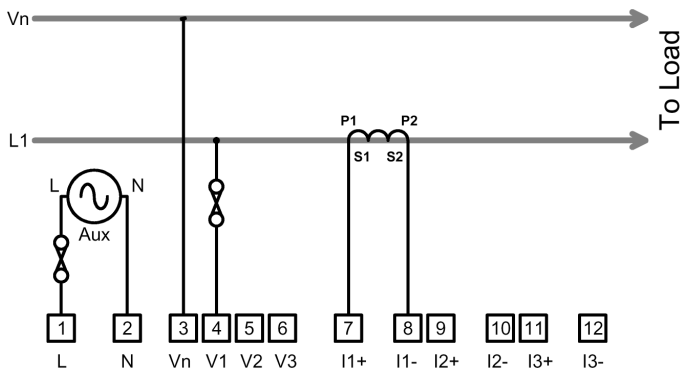


Ensure fuses are wired in as shown!
A suitable Din rail mounting fuse holder is type CSFL4U (for fuse 1A 5 x 20mm fuse, not included) and end plate type CSFLEPU. Refer to Eltek.

3-Phase 3 or 4 wire (*Optional Neutral)



3-Phase 3 wire (2 x CTs)



Single Phase

Where applicable V1 (4), V2 (5), V3 (6) can be linked to L(1). A fuse must be used (see note above) from L supply to L(1)

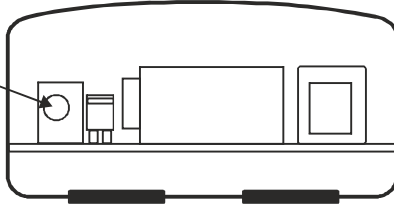
GD90A configuration using Darca software

Refer to the Quick start guide (ref TU1008) supplied with the RX250AI or download from <http://www.eltekdataloggers.co.uk/literature.shtml>

Connect the LCTX3 to the “Comms” socket):

To access the Comms connector, remove the two screws securing the case bottom to reveal the Comms connector. (Note GD90A cannot be configured by the logger only).

Comms connector



As a precaution disconnect the external 12VDC power supply before inserting the LCTX3 jack into the Comms socket. The external 12VDC can now be connected.

When configuration is completed disconnect the external 12VDC power supply before removing the LCTX3 jack. If the unit is not intended for immediate use, park the battery link so as to disconnect the internal battery. (See GD90A links page 4)

Before setting Tx channels please set the TX Interval:

Squirrel Channel to Transmitter Channel Assignments

Help Refresh Next Transmitter >> Close Transmitter Connections

Transmitter: Tx-18303

Sensor-On time (s): 0

User Preferred Tx Int: 00:01:40

Tx Interval: 00:01:40

Match

Set Sensor On Time

Set Log Int & Preferred Tx Int

Set Tx Interval

Total transmitter channels: 12
Used transmitter Channels: 0
Free transmitter Channels: 12
Battery Level (%): 83

Delete All Tx Channels

Set/Delete Selected Tx Channels

Auto Set (All Channels + Interval)-User Preferred

Channel: Current Squirrel Start Channel: 16 Update Channel Allocation

| Tx Chan: | Range: | Sq Chan: | | | | | Match: | Alarms: | Hi: | Lo: |
|----------|---------------------------------|----------|-------------|----------------|-------|---------------|-------------------------------------|---------|-----|-----|
| A | Voltage (0.0 to 500.0 V) | 5 | Set Channel | Delete Channel | Meter | Edit EU Range | <input checked="" type="checkbox"/> | | | |
| B | Voltage (0.0 to 500.0 V) | 6 | Set Channel | Delete Channel | Meter | Edit EU Range | <input checked="" type="checkbox"/> | | | |
| C | Voltage (0.0 to 500.0 V) | 7 | Set Channel | Delete Channel | Meter | Edit EU Range | <input checked="" type="checkbox"/> | | | |
| D | Current (0.0 to 1000.0 A) | 8 | Set Channel | Delete Channel | Meter | Edit EU Range | <input checked="" type="checkbox"/> | | | |
| E | Current (0.0 to 1000.0 A) | 9 | Set Channel | Delete Channel | Meter | Edit EU Range | <input checked="" type="checkbox"/> | | | |
| F | Current (0.0 to 1000.0 A) | 10 | Set Channel | Delete Channel | Meter | Edit EU Range | <input checked="" type="checkbox"/> | | | |
| G | Power Factor (-1.00 to 1.00) | 11 | Set Channel | Delete Channel | Meter | | <input checked="" type="checkbox"/> | | | |
| H | Power Factor (-1.00 to 1.00) | 12 | Set Channel | Delete Channel | Meter | | <input checked="" type="checkbox"/> | | | |
| I | Power Factor (-1.00 to 1.00) | 13 | Set Channel | Delete Channel | Meter | | <input checked="" type="checkbox"/> | | | |
| J | Pulse Count (0 to 65000 kWh) | 14 | Set Channel | Delete Channel | Meter | Edit EU Range | <input checked="" type="checkbox"/> | | | |
| K | Pulse Count (0 to 65000 Kvarh) | 15 | Set Channel | Delete Channel | Meter | Edit EU Range | <input checked="" type="checkbox"/> | | | |
| L | Voltage (0.0 to 1.0 Ext) | 16 | Set Channel | Delete Channel | Meter | Edit EU Range | <input checked="" type="checkbox"/> | | | |

- For Tx channels A to L, select only the channel range from the drop down as shown above and click on Set Channel. DO NOT ATTEMPT to use the “Edit EU Range” box.
- Channels D, E and F are fixed 0-1000A; ensure the range type setting on the NDRail350 matches the range of the connected CT! See operating manual (see link on Page 8)
- Channel L monitors connection of the external power supply: 0 = not connected and 1 = 12V connected. Darca Plus can use these values to set an alarm should the AC supply fail.

Setting NDRail350 Baud Rate and CT range

NDRail350 supplied by Eltek is configured for use with GD90A. If supplied direct, the communication baud rate must be set to 19200 (set Address to 1). To set the baud rate:

- Press I & V simultaneously for 4 seconds to show *CT*
- Press I to step to *br* (ignore *uN*, *PLr*, *PLt*, *PEo* and *Hr*)
- Press P (or E) to set to *19200*
- Press I to step to storing (ignore *Raddr*, *trud*, *Rudt*). Wait 3 seconds to complete.

The CT range must be set on the NDRail350 - see NDRail350 operating manual section 3.3.

GD90 specification

| | |
|---|---|
| Frequency: | Default is 434.225Mhz (other frequencies are available) |
| Tx compliance: | To EN300 220 -1 |
| Tx output power: | 10mW ERP |
| Useable Tx interval: | typically 10 seconds to 15 minutes |
| On air duration: | approximately 400mS |
| Environment: | Indoor only, rated IP40 |
| Temperature Range: | -10 to +55°C compliant to EN300 220-1, operational -30 to +60°C |
| Humidity: | 95% non condensing |
| Size: | 85 x 78 x 42mm (excluding 75mm antenna) |
| Weight: | 250g |
| Connection strip: | 8 x miniature pitch rising cage connector (included) |
| Antenna: | Supplied compressed spring, L=75mm, Gain -3db |
| Antenna connector: | SMA |
| Fixing: | WBG wall fixing bracket (optional) |
| Battery type: | PCB mounted (6V) 0.17Ah Ni-mH |
| Battery endurance: | typically >24 hours if battery fully charged |
| Charging time: | typically 36 hours from discharged to 80% capacity |
| Max lead length to NDRail350 (screened twisted pair): | <20m |

NDRail350 support information

Brochure - http://www.ndmeter.co.uk/files/ND_350_Retro-Fit_Meter_Brochure.pdf

User manual - http://www.ndmeter.co.uk/files/ND_PowerRail350_Manual.pdf

Installation manual – packed with product

SCL CT brochure - http://www.ndmeter.co.uk/files/SCL_Retro-fit_Current_Sensors.pdf

SCT CT brochure - http://www.ndmeter.co.uk/files/SCT_Retro-fit_Current_Sensors.pdf