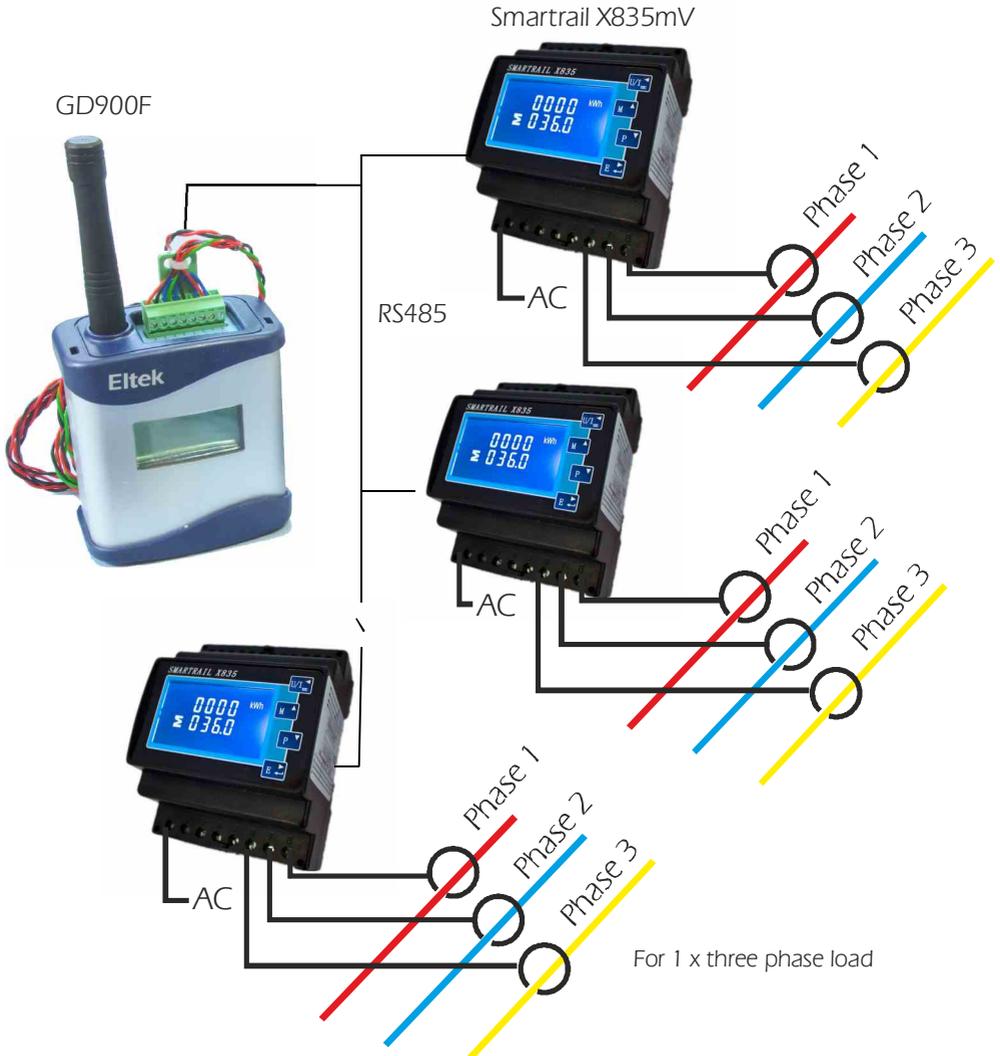


# Eltek TU1050 - GenII GD900F Energy monitor (multi-drop Smartrail X835mV) transmitter user instructions

## System configuration diagram



For 1 x three phase load

A maximum of 6 x Smartrail X835mV meters can be used with 1 x GD900F

## Introduction

The GD900F is part of the Eltek GenII family of transmitters. The GD900F can be used with up to six parallel connected Smartrail X835mV energy monitors and appropriate current transformers, providing comprehensive monitoring and patterns of use for multiple three phase supplies. The system is ideal for retro fit energy monitoring. The GD900F can be used alongside all other GenII transmitter types.

The system comprises:

- GD900F transmitter
- Up to 6 x Smartrail X835mV monitors (1 x three phase load meter)
- Clip on CTs
- TDK DSP10-12 DIN rail mounting power supply to power the GD900F

Eltek supplies the GD900F and TDK DSP10-12. For the supply of Smartrail X835mV meters refer to Smart Process and Control Ltd, tel 01268 680088.

Each Smartrail X835mV 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 per Smartrail X835mV are 3 x voltage, 3 x current, 3 x power factor ( $\cos\phi$ ), Import kWh, kvarH, total kWh and total kvarH. See the table on the following page for more details. Note that the GD900F has no facility to read export values from the Smartrail X835mV.

### GD900F specification

Frequency:	Default is 434.225Mhz (other frequencies are available)
Tx compliance:	To EN300 220 -1
Tx output power:	10mW ERP
Minimum Tx interval:	30 seconds
On air duration:	approximately 400mS
Environment:	Indoor only, rated IP40
Temperature Range:	-10 to +55°C compliant to EN300 220-1
Humidity:	95% non condensing
Size:	85mm x 78mm 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) approx. 150Ah Ni-mH
Battery endurance:	up to 24 hours if battery fully charged
Charging time:	typically 36 hours from discharged to 80% capacity
Max lead length to Smartrail X835mV (screened twisted pair):	20m

## GD900F channel assignment

- Channels can be presented at the RX250AL together with those from any other GenII transmitter and can be reordered during TX Setup. Note that currently the RX250AL receiver/logger is limited to 40 pulse channels.
- Channels can only be renamed when configuring the RX250AL with the Darca software.
- The GD900F assumes the identity of up to 6 'virtual transmitters', each of which represents a connected Smartrail X835mV. Each virtual transmitter has its own serial number.
- Channels of the individual virtual transmitters are labelled A through N.
- RX250AL channels are numbered 1 through 247.
- A fully loaded GD900F with 6 x Smartrail X835mV connected can occupy 84 channels of the RX250AL.

### Transmitter channels for an individual Smartrail X835mV / virtual transmitter:

Channel Displayed as	Phase/range	resolution	Function in Darca
A <i>A</i>	V1 0-500VAC	0.1	Voltage
B <i>B</i>	V2 0-500VAC	0.1	Voltage
C <i>C</i>	V3 0-500VAC	0.1	Voltage
D <i>D</i>	I1 0-1000A	0.1	Amps
E <i>E</i>	I2 0-1000A	0.1	Amps
F <i>F</i>	I3 0-1000A	0.1	Amps
G <i>G</i>	0-1	0.01	PF
H <i>H</i>	0-1	0.01	PF
I <i>I</i>	0-1	0.01	PF
J* <i>J</i>	P1 kWh	10Wh	Import kWh
K* <i>K</i>	P2 kWh	10Wh	Import kWh
L* <i>L</i>	P3 kWh	10Wh	Import kWh
M <i>M</i>		10Wh	total kWh
N <i>N</i>		10kvarh	total kvarh

\*Calculated channels

Channels J through N are pulse channels.

Note: For kWh and kvarh to read correctly the CT arrow (if available) must face the load.

## Use of the GD900 with the RC250

The GD900 functions as up to 6 transmitters with consecutive serial numbers.

The RC250 can only communicate with the first transmitter in the sequence.

The first serial number can be altered using the TxSetup program. Thus, the RC250 can be configured to receive data from the 6 consecutive virtual transmitters by changing the first serial number using TxSetup and configuring the RC250 one transmitter at a time.

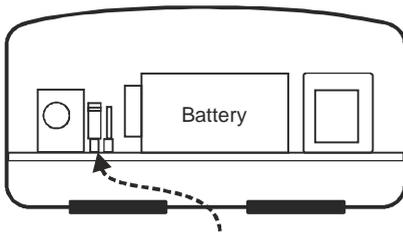
For example, if the GD900 serial number is 22001, it also has T-22002, 22003, 22004, 22005 and 22006 internally.

To configure the RC250 using the RXConfig software:

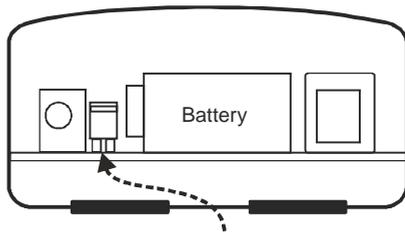
- 1. First configure the RC250 with the GD900 set to serial number 22001 to program this serial number
- 2. Change the GD900 to serial number 22002 using TxSetup
- 3. Configure the RC250 using this serial number to program it
- 4. Repeat steps 2 and 3 for serial numbers 22003, 22004, 22005 and 22006
- 5. Change the GD900 serial number back to 22001

### GD900F Links

The transmitter contains a rechargeable battery to maintain the GD900F 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

### 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 transmitter is fully functional if the battery is discharged when external power is applied. A charged battery can provide up to 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 TDK 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.

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. The LED will not flash until TX is enabled.
Tx enable (when configured)	5 seconds	1 continuous 5 sec flash	After 5 seconds displays sensor information

Red LED status when GD900F configured / not configured:

GD900F condition	LED	Note	LCD
GD900F not configured	"Blink" every 8 seconds		Battery gauge displayed only
GD900F 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 is imminent).

Only configured channels are displayed.

The LCD scrolls virtual transmitters (1 though 6) and their associated configured channels.

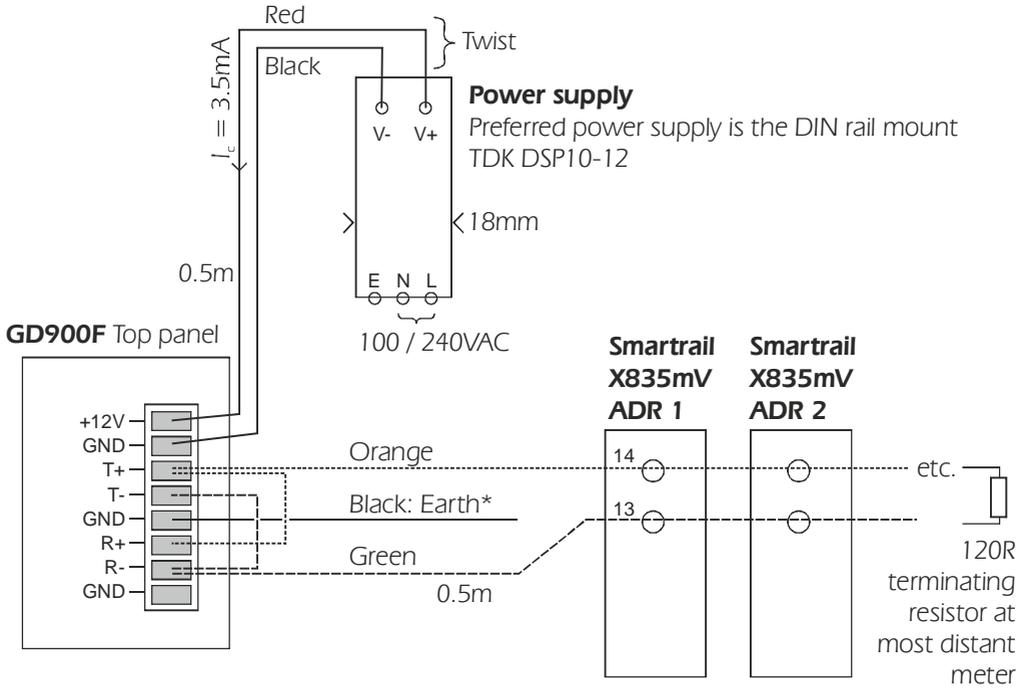
E.g. **3 A 235.0v** is reporting the third virtual transmitter 3, and that channel A is 235.0V. If the Smartrail X835mV is not connected or communications have failed, the display will read *"OPEN"*.

Note: If the GD900F is to be stored or will not be connected to a charging source for more than 48 hours, the GD900F 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 switch for 5 seconds. The LCD will now read *OFF*.

When storing for long periods, the red link should be set to 'Shipping' mode (see top of previous page.)

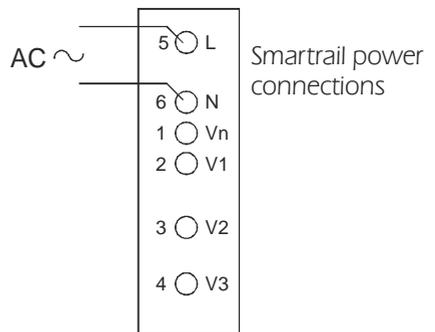
## Connecting the GD900F, Smartrail X835mV and TDK DSP10-12 power supply

The GD900F is supplied with a 0.5m tail for connection to TDK DSP10-12 power supply and Smartrail X835mV meters.



\*Refer to self-adhesive labels supplied with the Smartrail X835mV for earthing options.

DIN Rail mounting (width 72mm)  
Isolated serial comms



For single & three phase operation, refer to Smartrail X835mV operating manual.

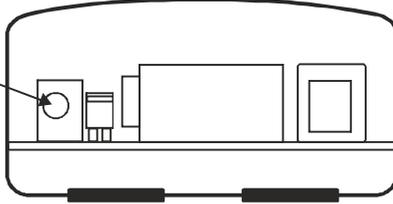
## GD900F configuration using Darca software

Refer to the Quick start guide (ref TU1008) supplied with the RX250AL 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 GD900F 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 GD900F links page 4)

Launch Darca and open the **Squirrel Channel to Transmitter Channel Assignments** window.

Before setting the Tx channels set the **TX Interval**:

**Squirrel Channel to Transmitter Channel Assignments**

Help Refresh << Prev V Tx Next V Tx >> Next Transmitter >> Close Transmitter Connections

**Transmitter: Tx-23630 (Virtual Tx 1 of 6)**

Sensor-On time (s): 0 Set Sensor On Time

User Preferred Tx Int: 00:01:40 -> Set Log Int & Preferred Tx Int

Tx Interval: 00:05:00 **Set Tx Interval**

Match Device Type: A20 <- Set Device Type

Total transmitter channels: 14  
Used transmitter Channels: 14  
Free transmitter Channels: 0  
Battery Level (%): 84

Delete All Tx Channels  
Set/Delete Selected Tx Channels  
Auto Set (All Channels + Interval)-User Preferred

**Channel:** Current Squirrel Start Channel: 56 Update Channel Allocation

Tx Chan:	Range:	Sq Chan:					Match:	Alarms:	Hi:
A	Voltage (0.0 to 500.0 V )	41	Set Channel	Delete Channel	Meter	Edit EU Range	<input checked="" type="checkbox"/>		
B	Voltage (0.0 to 500.0 V )	44	Set Channel	Delete Channel	Meter	Edit EU Range	<input checked="" type="checkbox"/>		
C	Voltage (0.0 to 500.0 V )	45	Set Channel	Delete Channel	Meter	Edit EU Range	<input checked="" type="checkbox"/>		
D	Current (0.0 to 1000.0 A )	46	Set Channel	Delete Channel	Meter	Edit EU Range	<input checked="" type="checkbox"/>		
E	Current (0.0 to 1000.0 A )	47	Set Channel	Delete Channel	Meter	Edit EU Range	<input checked="" type="checkbox"/>		
F	Current (0.0 to 1000.0 A )	48	Set Channel	Delete Channel	Meter	Edit EU Range	<input checked="" type="checkbox"/>		
G	Power Factor (-1.00 to 1.00 )	49	Set Channel	Delete Channel	Meter		<input checked="" type="checkbox"/>		
H	Power Factor (-1.00 to 1.00 )	50	Set Channel	Delete Channel	Meter		<input checked="" type="checkbox"/>		
I	Power Factor (-1.00 to 1.00 )	51	Set Channel	Delete Channel	Meter		<input checked="" type="checkbox"/>		
J	Pulse Count (0 to 65000 )	52	Set Channel	Delete Channel	Meter	Edit EU Range	<input checked="" type="checkbox"/>		
K	Pulse Count (0 to 65000 )	53	Set Channel	Delete Channel	Meter	Edit EU Range	<input checked="" type="checkbox"/>		
L	Pulse Count (0 to 65000 )	54	Set Channel	Delete Channel	Meter	Edit EU Range	<input checked="" type="checkbox"/>		
M	Pulse Count (0 to 65000 )	55	Set Channel	Delete Channel	Meter	Edit EU Range	<input checked="" type="checkbox"/>		
N	Pulse Count (0 to 65000 )	56	Set Channel	Delete Channel	Meter	Edit EU Range	<input checked="" type="checkbox"/>		

# GD900F method of operation

## Sampling the meters

The GD900F reads and stores the values from the Smartrail X835mV meters every 18 seconds. 14 sets of values per meter are stored and a (3 minute) rolling average is kept.

## Transmitting the data

At each transmission the GD900F transmits the average of the 11 values for voltage, current and power factor. The actual transmission time of the virtual transmitters begins at a random point of time within the transmission interval. The default TX interval is preset to 5 minutes but can be altered as required.

## A note about 'Virtual Transmitters'

For ease of use, The multiple Smartrail X835mV meters connected to a GD900F transmitter will appear as a series of 'virtual transmitters' in Darca (and are treated as such by the receiver/logger). Each virtual transmitter will have its own serial number. These virtual transmitter serial numbers run sequentially starting with the GD900F's serial number. For example:

GD900F serial number: 20001

Smartrail address 1: virtual transmitter serial number: 20001

Smartrail address 2: virtual transmitter serial number: 20002

Smartrail address 3: virtual transmitter serial number: 20003

Smartrail address 4: virtual transmitter serial number: 20004...etc.

After configuring the transmitter channels for the first Smartrail X835mV in Darca's

**Squirrel Channel to Transmitter Channel Assignments** window, you can move to the next connected meter in the list by clicking **Next V Tx** (Next virtual transmitter). The next meter can then be configured in the same way. To move back to the previous meter in the list, use **<< Prev V Tx** (previous virtual transmitter).

## Configuring a virtual transmitter

- For Tx channels A to K: select only the channel range from the drop down as shown in the screen shot 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 Smartrail X835mV matches the range of the connected CT! See the operating manual for more details.
- **Device Type** should always be set to **A20**.
- Communications should be set to **9600** baud (the default setting)

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