Service Manual R8521A

Type KITZ 101

GEC ALSTHOM

T&D

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Section 1. INTRODUCTION

The KBUS communication system was developed to allow connection of remote K-series units (slaves) to a central point of access (a master control unit eg. a PC and a KITZ unit), thus allowing remote control and monitoring functions to be performed using an appropriate communication language. The system was initially developed for use in the electrical supply industry at distribution voltage levels, but can equally be applied to other voltage levels or indeed to other systems which would benefit from such a communication system.

This document details the KITZ 101 interface unit used in conjunction with GEC ALSTHOM T&D Protection & Control K-series protection relays. It describes the operation and features of the unit in sufficient detail to allow users to interface this unit to other devices (PCs or MODEMS).

This guide should be used in conjunction with the service manual of the equipment with which the KITZ 101 is to be interfaced.

The unit allows conversion between the KBUS data format and IEC-870 - 5 FT 1.2. data format. This enables (for example) a PC based master station to communicate with K-series units (relays).

Section 2. HANDLING AND INSTALLATION

2.1 General considerations

2.1.1 Receipt of KITZ units

Although the KITZ 101 interface unit is of a generally robust construction, the unit requires careful treatment prior to use on site. Upon receipt, the unit should be examined immediately, to ensure no damage has been sustained in transit. If damage has been sustained during transit, a claim should be made to the transport contractor, and a GEC ALSTHOM T&D Protection & Control representative should be promptly notified.

2.2. Electrostatic discharge (ESD)

The KITZ unit uses components that are sensitive to electrostatic discharges. The electronic circuits are well protected by the metal case and the internal components should not be exposed by removal of the top or front of the case. There are no user setting adjustments within the unit.

A person's normal movements can easily generate electrostatic potentials of several thousand volts. Discharge of these voltages into semiconductor devices when handling electronic circuits can cause serious damage, which often may not be immediately apparent but the reliability of the circuit will have been reduced.

When transporting the unit, care should be taken so that the RS232 port is not subjected to ESD. Touching the case will ensure you are at the same electrostatic potential as the unit.

If you are making measurements on the internal electronic circuitry of an equipment in service, it is preferable that you are earthed to the case with a conductive wrist strap. Wrist straps should have a resistance to ground between 500k-10M ohms. If a wrist strap is not available, you should maintain regular contact with the case to prevent a build-up of static. Instrumentation which may be used for making measurements should be earthed to the case whenever possible.

More information on safe working procedures for all electronic equipment can be found in BS 5783 and IEC 147-OF. It is strongly recommended that detailed investigations on electronic circuitry, or modification work, should be carried out in a Special Handling Area such as described in the above-mentioned BS and IEC documents.

2.3. Unpacking

Care must be taken when unpacking and installing the unit to prevent damage.

2.4. Storage

If the KITZ unit is not to be installed immediately upon receipt it should be stored in a place free from dust and moisture in the original carton. Where de-humidifier bags have been included in the packing they should be retained. The action of the de-humidifier crystals will be impaired if the bag has been exposed to ambient conditions and may be restored by gently heating the bag for about an hour, prior to replacing it in the carton.

Dust which collects on a carton may, on subsequent unpacking, find its way into the unit; in damp conditions the carton and packing may become impregnated with moisture and the de-humidifier will lose its efficiency.

Storage temperature –25°C to +70°C.

Section 3. KITZ FEATURES

The protocol converter features are as follows:

Operates from 110/120V ac or 220/240V ac 50/60Hz mains supply.

Converts KBUS messages to IEC-870 format.

Converts IEC-870 messages to KBUS format.

Allows alternative data communication rates on the IEC-870 port.

Optionally adds a time tag to K-series reply messages.

Buffers incoming messages thus allowing transmission at lower speed.

Allows synchronisation of the real time clock via the communications.

Section 4. CONNECTION

A typical application connection arrangement is shown below:

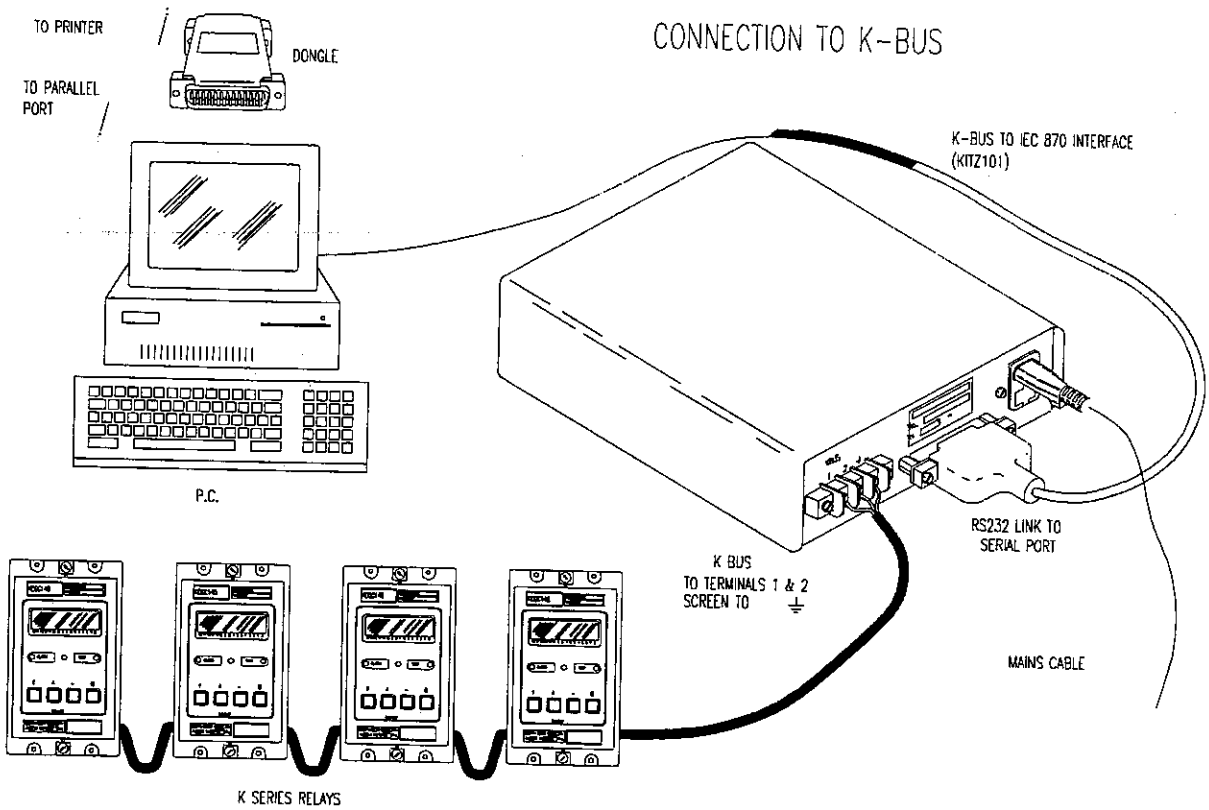


Figure 1. Typical application of KITZ 101 interface unit.

A schematic representation of a typical application connection arrangement is shown below:

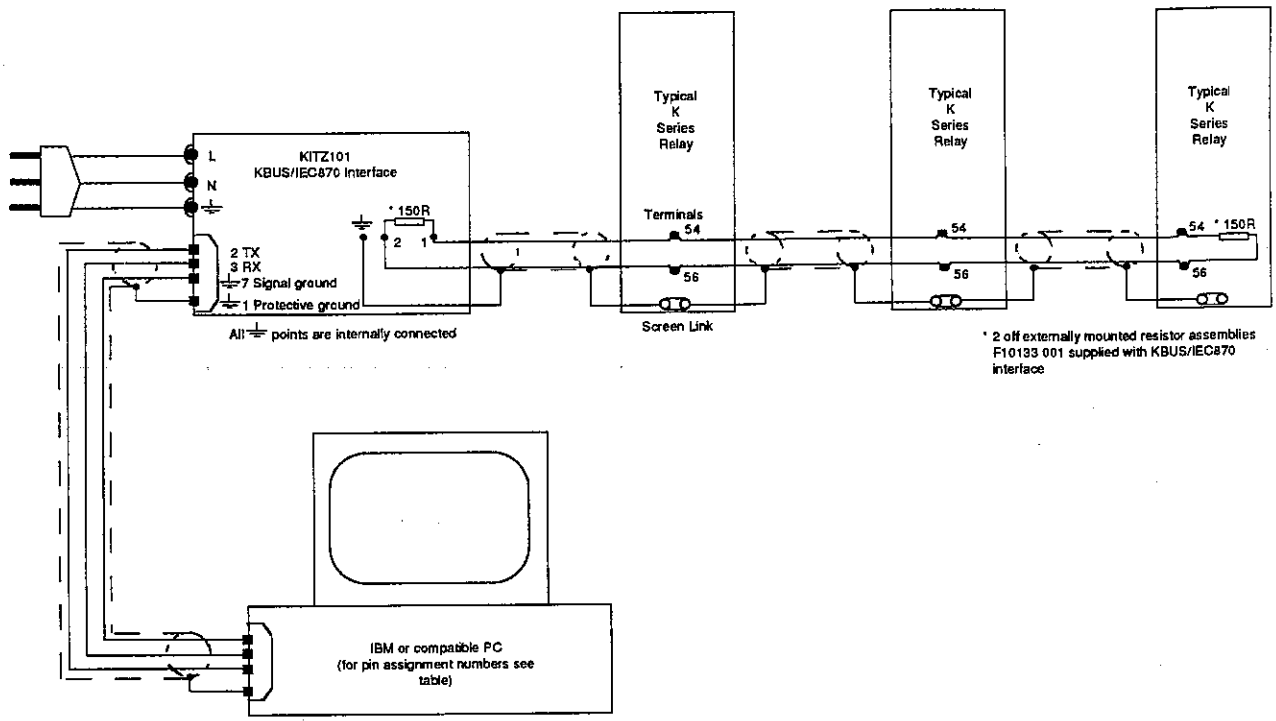


Figure 2. KITZ 101 IEC-870 (RS232) port to PC serial port connections.

4.1 RS232 (IEC-870) connection

4.1.1 Recommended cable

A standard PC serial port interface cable (with the connections listed in Table 1) should be used. It is essential that the cable screen is earthed at one end to ensure adequate screening. The connectors should be screw-locked to the KITZ and the PC.

4.1.2 Cable length

The maximum recommended length of cable from the IEC-870 Communications port is 15 metres (50 feet) or 2500 pF total cable capacitance. For longer distance communication on the IEC-870 port an external RS485 interface may be required.

4.1.3 Data rates

The maximum data communication rate specified in the RS232-c standard is 20 kbits/s. The KITZ unit will support faster communication data rates (up to 115.2 kbits/s) for use with development tools such as K-Spy.

The following table shows the connections required to interface a KITZ 101 to a user PC serial data port. These connections are for guidance only and reference should be made to the PC user manual.

Note that the terms "Receive Data" and "Transmit Data" (in Tables 1 and 2) refer to the named connector and **not** to a nominated end.

KITZ 101 25 Pin 'D' male connector (DTE)	PC-at laptop 9 Pin 'D' male connector (DTE)	PC or PS/2 Type 25 Pin 'D' male connector (DTE)
1 - Protective Ground	No Connection	1 - Protective Ground
2 - Transmit Data	2 - Receive Data	3 - Receive Data
3 - Receive Data	3 - Transmit Data	2 - Transmit Data
7 - Signal Common	5 - Signal Common	7 - Signal Common
Connector Shell to Cable Screen (see note)		

Table 1 KITZ 101 / PC RS232 port inter-connections.

Note: The RS232 cable screen should be connected to earth at one end. Pin 7 (Signal Common) or Pin 1 (Protective Ground) can be used as an alternative to the Connector Shell.

The following table lists the complete (Modem Control) pin functions of the KITZ 101 and the PC:

Pin No	KITZ (DTE) Connector	PC AT LAPTOP 9 Pin female connector (DTE)	PC or PS/2 Type 25 Pin male connector (DTE)
1	Protective Ground	Carrier Detect (CD)	Protective Ground
2	Transmit Data (Tx)	Receive Data (Rx)	Transmit Data (Tx)
3	Receive Data (Rx)	Transmit Data (Tx)	Receive Data (Rx)
4	Request To Send (RTS)	Data Terminal Ready (DTR)	Request To Send (RTS)
5	Clear To Send (CTS)	Signal Common	Clear To Send (CTS)
6	Data Set Ready (DSR)	Data Set Ready (DSR)	Data Set Ready (DSR)
7	Signal Common	Request To Send (RTS)	Signal Common
8	Carrier Detect (CD)	Clear To Send (CTS)	Carrier Detect (CD)
9		Ring Indicator (RI)	
20	Data Terminal Ready (DTR)		Data Terminal Ready (DTR)
22			Ring Indicator (RI)

Table 2 KITZ 101 & PC RS232 port modem control connections.

4.2 KBUS connection

4.2.1 Recommended cable

Twisted pair of wires with outer screen, to DEF STANDARD 16-2-2c 16 Strands of 0.2mm diameter, 40mΩ per metre per core, 171pF per metre (core to core), 288pF per metre (core to screen).

4.2.2 Connection method

KBUS is a multi-drop standard. The KBUS cable extends from a KITZ interface unit and is daisy-chained from one slave device to the next in a radial fashion. The total KBUS cable from the master control unit to the farthest slave device is known as a spur. No branches may be made from the spur.

4.2.3 Cable termination

Four millimetre looped screw termination or fast-on connection (as per MIDOS standard terminations). The outer screen should be earthed at one point of the cable only, preferably at the connection to the KITZ unit. The transmission wires should be terminated using a 150Ω resistor at both extreme ends of the cable.

4.2.4 Cable polarity

Polarisation is not necessary for the 2 twisted wires.

4.2.5 Maximum cable (spur) length

The maximum cable length is 1000m.

4.2.6 Maximum slave devices per spur

The maximum number of slave devices per spur is 32.

Section 5: KITZ OPTION SWITCHES

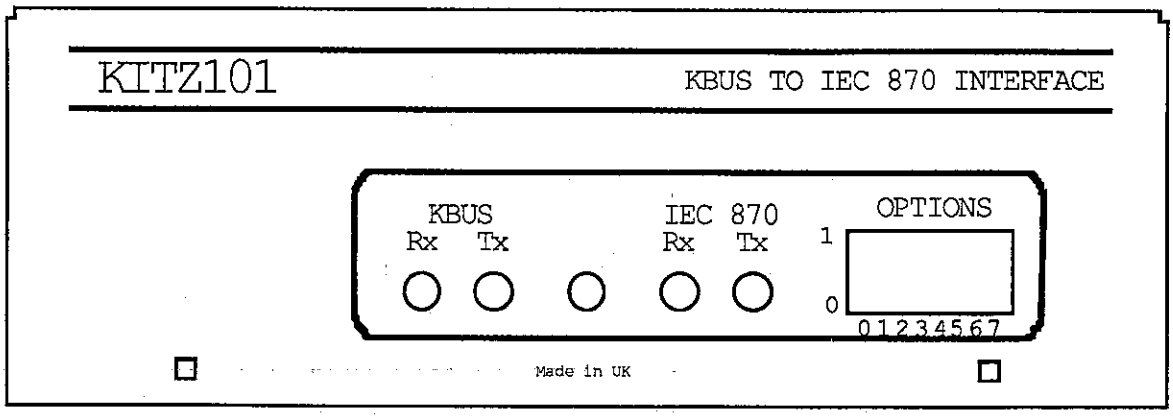


Figure 3. KITZ 101 front plate layout.

5.1 Option switch settings

The option switches on the KITZ front plate allow the user to configure the KITZ to suit the application requirements.

The following table lists the KITZ option switch functions.

Switch No.	Function
0 to 2	RS232 (IEC-870) baud rate selection
3	RS232 (IEC-870) frame format
4	Add IEC time tag to KBUS message
5	Modem present
6	Modem set-up
7	Reserved

Table 3. KITZ 101 option switch functions.

A switch function is operational when in the UP position (marked 1). The switch position at power-up determines which features are enabled (or settings apply). Any changes made to the switches while the supply is present will not affect the operation.

5.2 Baud rate selection

The three left-hand switches (switches 0 to 2) control the KITZ 101 IEC-870 (RS232) port data communication rate setting.

The RS232 port is capable of supporting asynchronous serial communication at the data rates specified in Table 4. The corresponding switch settings are also shown in the table.

Baud Rate	Switch 0	Switch 1	Switch 2
1200	Position 0	Position 0	Position 0
2400	Position 1	Position 0	Position 0
4800	Position 0	Position 1	Position 0
9600	Position 1	Position 1	Position 0
19200	Position 0	Position 0	Position 1
38400	Position 1	Position 0	Position 1
57600	Position 0	Position 1	Position 1
115200	Position 1	Position 1	Position 1

Table 4. KITZ 101 IEC-870 (RS232) Port Baud Rate Selection.

5.3 RS232 (IEC-870) frame parity

The third switch allows the frame format of the RS232 (IEC-870) communications port to be set to the following modes:

Position 0 Asynchronous 11 bit (1 start bit, 8 data bits, 1 parity , 1 stop bit)

Position 1 Asynchronous 10 bit (1 start bit, 8 data bits, no parity , 1 stop bit)

The normal operational mode of the KITZ 101 unit uses the 11 bit frame format. However, some equipment to which the KITZ unit is to be interfaced can only support the 10 bit frame format (eg. modems).

The use of the 10 bit frame format will result in a less secure communications protocol which does not meet the IEC-870 - 5 FT 1.2 requirements.

5.4 Time tagging of KBUS messages

The fourth switch appends the RTC time to a received KBUS message.

The KITZ 101 Interface unit will insert an IEC-870 format time tag into a converted IEC-870 courier message if the following conditions apply:

1) Switch 4 (fifth from left is set).
2) The message contains a millisecond timer count (DTL Type 38h - 3Bh).
3) The message contains a courier status byte (or bytes) (DTL Type 5Ch - 5Fh).
4) An IEC-870 time tag (DTL Type 3Ch - 3Fh) is not already contained before the status byte within the message.

The IEC-870 time tag will be added after the millisecond count. The time tag format is shown below.

IEC TIME DTL (EXT)	Extended Length	ms.	Minutes	Hour	Day	Month	Year
3C	07	0 - 59999	0 - 59	0 - 23	1 - 31	1 - 12	0 - 99

The IEC-870 time tag value is the time of reception of the first byte of the KBUS message.

5.5 Modem control

The Modem Set-up and Modem Present switches control the KITZ 101 unit mode of operation when connected to a modem. This is shown in the following table:

Modem Present (Switch 5)	Modem Set-Up (Switch 6)	Function
Position 0	Position 0	Normal operation - Modem control lines (CTS, DSR and DCD) ignored. DTR always active, RTS reflects Receive / Transmit state.
Position 1	Position 0	Modem control lines (CTS (Tx), DSR (Rx) and DCD (Rx)) must be active to START (see note) communication. DTR always active, RTS reflects Receive / Transmit state.
Position 0 or 1	Position 1	Communication disabled on RS232 and KBUS ports.

Table 5. KITZ 101 RS232 modem control.

Note: DSR and DCD are only required to be active at the start of message reception, while CTS is only required to be active at the start of message transmission.

Section 6. KITZ LED INDICATIONS

The KITZ unit has five led indications.

The green led indicates that the KITZ unit is in the powered-up state. The four yellow leds indicate the status of the KBUS and IEC-870 communications.

The Receive KBUS message led (KBUS Rx) indicates that a message is being received on the KBUS communications port.

The Transmit KBUS message led (KBUS Tx) indicates that a message is being transmitted on the KBUS communications port.

The Receive IEC message led (IEC Rx) indicates that a message is being received on the IEC-870 communications port.

The Transmit IEC message led (IEC Tx) indicates that a message is being transmitted on the IEC-870 communications port.

A detailed description of the led indication operation is shown below.

Indication	"On" State	"Off" State
Green led	Supply present	No supply
KBUS Rx	When the first character of the KBUS message is received.	(1) When the end of message is received (CRC). (2) When a time-out error occurs. (3) When disabled (i.e. when a valid IEC-870 message has been received on the other channel).
KBUS Tx	When a KBUS message is ready for transmission (loaded in transmit buffer).	(1) When all message characters have been transmitted including the CRC. (2) When a time-out error occurs.
IEC 870 Rx	When the first IEC-870 Start character (68h) of the IEC-870 message is received.	(1) When the end of message is received (IEC-870 Stop character (16h)). (2) When a time-out error occurs. (3) When disabled (ie. when a valid KBUS message has been received on the other channel)
IEC 870 Tx	When an IEC-870 message is ready for transmission (loaded in transmit buffer).	(1) When all message characters have been transmitted. (2) When a time-out error occurs.

Table 6. KITZ 101 led indications.

Section 7. PROTOCOL CONVERSION

7.1 Message format

The KITZ interface unit main function is to convert KBUS message data to IEC-870 - 5 FT1.2 format for communication with a PC.

The KBUS message format is shown below:

PRE-AMBLE	START FLAG	A0	A(1-5)	0	Message Length	DTL	Control	DTLs + Data	CRC	STOP FLAG
00 00	7Eh			0		61				7Eh

The KBUS frame is based upon the ISO High level Data Link Control (HDLC) protocol. This is a bit-oriented protocol and eliminates much of the control overhead associated with byte-oriented protocols. The information field of the HDLC frame is

totally transparent and the information can take on any form and contain any binary bit combination.

The IEC-870 Message format as used by a PC-based K-series master station is shown below:

START FLAG	Message Length	Message Length	START FLAG	Control	A0	A(1-5)	0	DTLs + Data	Check-sum	STOP FLAG
68h			68h				0			16h

For further details of the IEC-870 - 5 FT1.2 message format see the appropriate IEC specification.

7.2 Message validation

Message validation takes place during and after message reception.

7.2.1 KBUS message validation

The framing of the KBUS message must be correct (HDLC Start and Stop flags present).

At the end of a frame:

a) CRC (HDLC)
b) Data overrun
c) Residue (HDLC information field is an exact number of bytes)
d) Correct message length (matches received message data)

During a frame:

a) Character time-out
b) Receive Buffer overflow
c) Message is too long

7.2.2 IEC message validation

The framing of the message must be correct for IEC-870 - 5 FT1.2.

At the start of a frame:

a) A correct header frame must be present (2 Starts + matching lengths).
b) A time of greater than 33 bit transmissions (at current baud rate) must have elapsed since the last erroneous message

At the end of a frame:

a) Checksum is correct
b) A STOP character must be present.

During a frame:

a) Framing error
b) Overrun error
c) Character parity (if enabled)
d) Character time-out
e) Receive Buffer overflow
f) Message is too long

7.3 Message time-out

The KITZ unit uses timers to speed-up re-initialisation of message reception and transmission when a message timing error occurs (on the KBUS or IEC-870 port).

7.3.1 KBUS timers

The received KBUS message is checked for character gaps. The timer value is 2ms between characters.

The transmitted KBUS message cannot take greater than 125ms to transmit.

7.3.2 RS232 (IEC-870) timers

These timer values are dependent on the baud rate used (the baud rate switch position determines the timer value used).

The received IEC-870 message is checked for character gaps within the message. The maximum gap allowable is 3 bytes (at current baud rate).

The transmitted IEC-870 message is not allowed to take greater than a 500 byte time period (at current baud rate) to transmit.

Note: IEC-870 - 5 FT1.2 states that data transmitted in this format should not have inter-character gaps. The KITZ unit transmits using this format, but the receiver allows gaps as mentioned above. The 3 byte (33 bit) delay after message error is adhered to.

7.4 Conversion sequences

When a valid message is received on one channel (either KBUS or IEC-870), the following operation occurs:

(1) the other channels receiver is disabled.
(2) the message is converted (IEC-870 to KBUS or KBUS to IEC-870).
(3) the message is transmitted on the other channel.
(4) the other channels receiver is re-enabled.

7.5 Receive message buffering

Under normal operating conditions the KITZ 101 unit will not need to buffer received messages because the master station will send a message and then wait for a reply. However if direct conversion is required (ie. using development tools such as K-Spy) message buffering will be inevitable. If the received message data rate is higher than the transmitted data rate, multiple message buffering (and eventual overflow) will

occur. If the received message data rate is lower than (or equal to) the transmitted data, only one incoming message will have to be buffered while the previous message is being transmitted.

The KITZ unit is capable of buffering up to 2048 bytes of message data (but not exceeding 64 individual messages) on one channel while transmitting data on the other channel. After this limit has been reached, received messages will be ignored until space is available in the internal buffer (ie. a complete message has been transmitted).

When multiple buffering of received messages occurs, the messages will be converted and transmitted in the order in which they were received. The other channel's receiver will not be re-enabled until after all valid messages have been converted and transmitted.

Note: An individual valid KBUS message cannot be longer than 260 bytes (255 bytes of data). The corresponding IEC-870 message limitation is 261 bytes (255 bytes of data).

Section 8. KITZ ADDITIONAL FEATURES

8.1 Real time clock (RTC) synchronisation

The KBUS protocol converter real time clock (RTC) can only be synchronised over the IEC-870 communications link. A courier command allows setting of the RTC.

The command format is as follows:

Command DTL	Command Set IEC Time (RTC)	IEC TIME DTL (EXT)	Extended Length	Milli-seconds.	Minutes	Hour	Day	Month	Year
05	45	3C	07	0 - 59999	0 - 59	0 - 23	1 - 31	1 - 12	0 - 99

The protocol converter will check the incoming IEC-870 message for a synchronise RTC (real time clock) command sequence and if found sets the RTC to the specified time. The Synchronise RTC command is not transmitted on the KBUS channel; ie. no protocol conversion takes place.

The 'synchronise RTC' command must be the only command after the IEC control byte within the message, otherwise normal protocol conversion occurs.

The RTC setting value sent by the master station should correspond to the start of the transmitted message (to the KITZ 101 unit).

If time-tagging of KBUS messages is not required, the RTC need not be synchronised.

Section 9. TECHNICAL DATA

9.1 Ratings - auxiliary supply

Auxiliary Voltage (Vx) Nominal Rating DC Supply	Operative Range AC 50/60Hz
110 / 120 V	93.5 - 138V
220 / 240 V	187 - 276V

Frequency (Fn) Nominal Rating	Operative Range
50Hz or 60Hz	45 - 65Hz

9.2 Burden - auxiliary supply

110 / 120V AC Supply at 138V (45 - 65Hz). communicating with relay
220 / 240V AC Supply at 276V (45 - 65Hz). communicating with relay

< 2.0 VA measured for above conditions.

< 3.0 VA measured with KBUS communications and IEC-870 (RS232) port shorted to ground.

< 3.0 VA measured with IEC-870 (RS232) communications and KBUS port shorted to ground.

9.3 Accuracy

9.3.1 Real time clock (RTC)

RTC drift from setting at 20°C (over range –25°/ +55°C) < 8s per 24 hours
Synchronisation Error: Time setting Error ±1.5ms*
Time Tagging Error: Current RTC Time Error +0 ms / –1ms

* At high data rates (38400 and above) the synchronisation error approaches ±1.0ms maximum

9.3.2 Software communication timers

IEC data receive character gap timer: 3 Bytes +2.0 / –0ms
IEC data receive error break timer: 33 Bits +2.0 / –0ms
IEC data transmit maximum transmit time: 500 Bytes +2.0 / –0ms
KBUS data receive character gap timer: 2.0ms ±1.0ms
KBUS data transmit maximum transmit time: 500 bytes (62.5ms) +2.0 / –0ms

9.4 Operation indicator

5 light emitting diodes - internally powered.

9.5 Communication ports

9.5.1 KBUS port

Language:	COURIER
Transmission:	Synchronous - RS485 voltage levels
Transmission Coding:	FM0
Frame Format:	HDLC
Baud Rate:	64k/bit per second
K-Bus Cable:	Screened twisted pair
K-Bus cable length:	1000m of cable.
K-Bus Loading:	32 units (multi-drop system)

Electrical interface:

Transformer coupled:

Primary:	100T, 0.15mm
Secondary:	100T, 0.15mm
Primary Inductance	60mH
RM6 core to DIN 41980 & IEC431	
Signal transformer grade ferrite:	
Initial permeability μ_i:	10,000
Effective area A_e:	36.6mm^2

Isolation: 2kV rms for one minute

Voltage signals:
Based on RS485 differential voltage levels:

Unloaded driver differential output:	±5V
Receiver input sensitivity:	±200mV

K-BUS interface

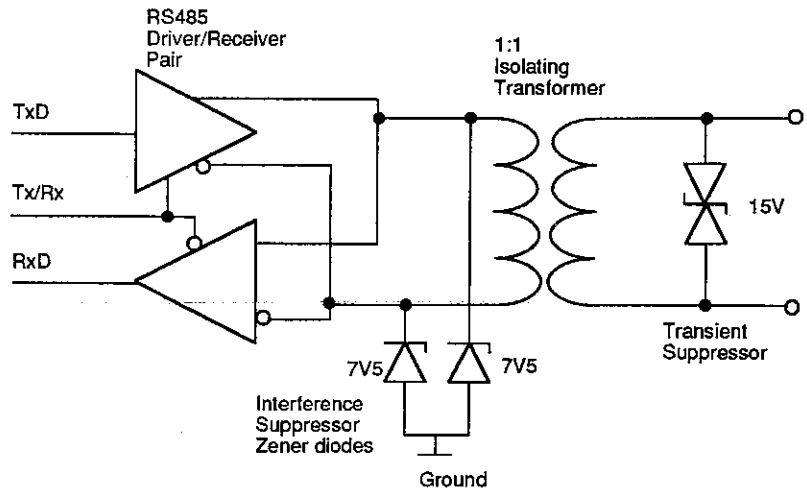


Figure 4. Circuit diagram of K-BUS electrical interface.

9.5.2 IEC-870 (RS232) port

Language:	COURIER
Transmission:	Asynchronous - RS232 voltage levels
Transmission coding:	NRZ
Frame format (switch 3 = position 0):	Asynchronous - 11 bit (1 start bit, 8 data bits, 1 parity (even) 1 stop bit)
Frame format (switch 3 = position 1):	Asynchronous - 10 bit (1 start bit, 8 data bits, no parity, 1 stop bit)
Baud rate:	1200 to 115200 bits per second
RS232 cable:	RS232 serial interface lead
RS232 cable length:	15m of cable (or 2500pF total cable capacitance)
RS232 Loading:	2 units (point to point system)

9.6 Message buffers

KBUS

Maximum message size:	260 bytes
Receive Data Buffer Size:	2048 bytes

IEC-870

Maximum message size:	261 bytes
Receive Data Buffer Size:	2048 bytes

9.7 High voltage withstand

The high voltage withstand tests can be performed on the following independent circuits:

Auxiliary supply
KBUS communication port

The IEC 870 port is earthed locally and should not be tested for high voltage withstand. It is protected by the cable screen.

9.7.1 Insulation

2.0kV rms for one minute between all terminals wired together and case earth.
2.0kV rms for one minute between terminals of independent circuits.

9.7.2 Impulse IEC255-5

5kV peak, 1.2/50μs, 0.5J between all terminals of independent circuits and terminals of independent circuits to case earth.

0kV peak on IEC-870 port

9.7.3 High frequency disturbance IEC255-22-1/2

2.5kV peak between independent circuits and independent circuits to case.
0kV peak on IEC-870 port

9.7.4 Fast transient IEC255-22-4

Auxiliary supply	Class 4 (4 kV)
KBUS communication port	Class 4 (4 kV - capacitive coupling)
IEC-870 Port	None

9.7.5 Static discharge tests

Class 4 (8 kV) - point contact discharge.

Note: The IEC-870 port will not withstand static discharges (air or contact).

9.8 Environmental

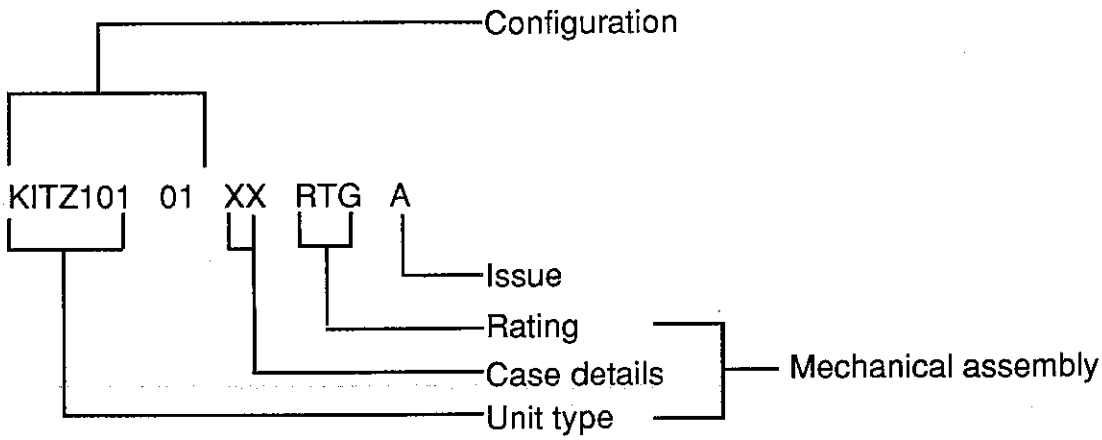
9.8.1 Temperature IEC68-2-3

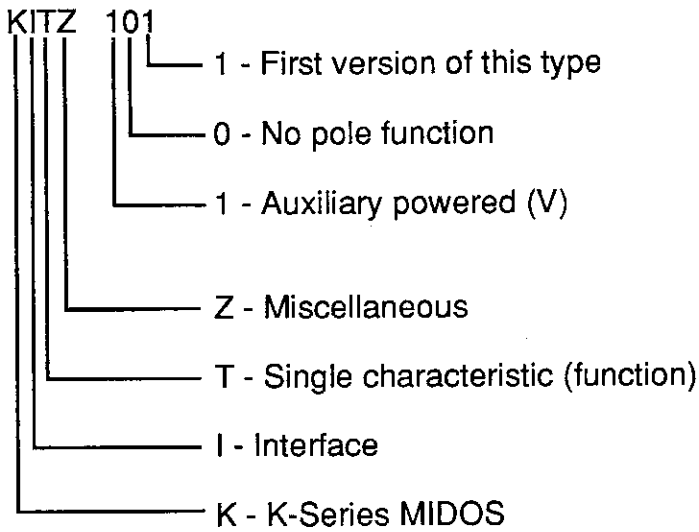
Storage and transit:	–25°C to +70°C
Operating:	–25°C to +55°C

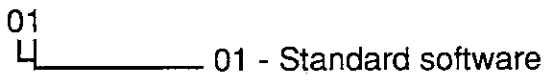
9.8.2 Humidity IEC68-2-3

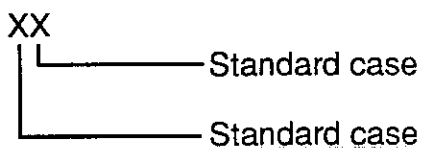
56 days at 93% relative humidity and 40°C

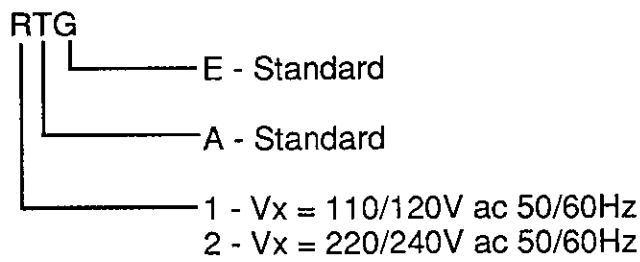
9.9 Model numbers











Section 10. COMMISSIONING

10.1 Commissioning preliminaries

The KITZ unit should be commissioned in conjunction with the K-series master station software (running on a PC) and (at least) one K-series relay.

10.1.1 Module connection

Reference should be made to Section 3 and the user manual of the computer (PC) on which the master station software is to be run.

10.1.2 Electrostatic discharge (ESD)

See recommendations in Section 2 of this user manual before handling the module.

10.1.3 Inspection

Carefully examine the unit and case to see that no damage has occurred since installation.

10.1.4 Earthing

10.1.4.1 Mains earthing

The KITZ unit must be earthed.

If the mains supply has no earth connection, the KITZ interface unit earthing connection on the rear of the case must be used to connect the unit to a local (mains) earth.

10.1.4.2 KBUS earthing

The KBUS cable screen should only be connected to earth at one point in the communication system. This will normally involve connecting the cable at the master station end to the KITZ interface unit earth connection and **not** at any other point.

10.1.5 Insulation

Insulation tests only need to be done when required.

Isolate all wiring form the earth and test the insulation with an electronic or brushless insulation tester at a DC voltage not exceeding 1000V. Terminals of the same circuits should be temporarily strapped together.

The main groups on the relays are given below:

Auxiliary voltage supply
KBUS Communication port
Case earth

This test should not be performed on the IEC870 (RS232) communications port.

10.1.6 Equipment required

The KITZ units require the following:

AC voltmeter 0-300V

A portable PC, with master station software and a K-series relay are essential for commissioning the KITZ 101 K-Bus/IEC 870 interface unit.

10.2 Auxiliary supply tests

The unit will operate from either a 110V/120V or 220/240V AC auxiliary supply depending on the version. The incoming voltage must be within the operating range specified in Table 7.

KITZ Rating (V)	AC Operating Range	Maximum Crest Voltage
110/120	93.5 - 138V ac	195V crest
220/240	187 - 276V ac	390V crest

Table 7. KITZ 101 auxiliary supply rating.

The green supply indication should be on when the auxiliary supply voltage is greater than the minimum specified level.

10.3 Settings

When the KITZ 101 interface unit is used to allow a PC (running master station software) to communicate with K-series relays (ie. normal operation), the following applies:

Check baud rate (option switches 0-2) setting on the IEC-870 (RS232) port corresponds to the data communication rate of the master station. The standard setting is 19200 baud and the following option switch position apply:

Option Switch 0 is set to 0 (Down)
Option Switch 1 is set to 0 (Down)
Option Switch 2 is set to 1 (Up)

Option Switch 3 (RS232 (IEC870) frame format) should be set to the 0 (Down) position.

Option Switch 4 (Add IEC time-tag) should be set to the 1 (Up) position.

Option Switches 5 and 6 (Modem Present and Modem Set-up) should be set to the 0 (Down) position.

Option Switch 7 (reserved) should be set to the 0 (Down) position.

Section 11. PROBLEM SOLVING

Common operational faults are listed in this section. The solutions offered are for guidance only.

11.1 Green supply indication is off

Check correct auxiliary supply is present (no supply or 110/120V applied to a 220/240V version).

Check fuse.

11.2 Fuse blows on power-up.

Check that excessive auxiliary supply voltage is not being used (220/240V applied to a 110/120V Version).

11.3 IEC 870 receive indication is off when communicating with a master station

Check baud rate selection for IEC-870 (RS232) port is identical to that of the master station .

Check master station is polling for data.

11.4 KBUS receive indication is off when communicating with a master station (and relay)

Relay is not communicating (incorrect address / not configured etc.): refer to the appropriate K-series service manual.

No termination resistor fitted to K-BUS, or incorrect value.

11.5 Slow communications response (many retries)

No termination resistor fitted to K-BUS, or incorrect value.

APPENDIX 1. SERVICE MANUAL REVISIONS

The service manual revisions are:

Document R8521	Issue A	July 1993	First issue.

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T&D

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