



## Using the TIU Terminal Range with IMO K Series PLC's.

### Note

This document assumes that all items have correct power applied, Cbreeze software is running a download cable is connected between the computer and the TIU terminal and the correct cable is installed between the TIU and the equipment being used.

### Protocol Revisions

IMO\_R1.00 or later -supports master only operation to the slave PLC. Communication to the Automation Equipment (**AE**) is via the PLC Port on the TIU terminal. See attached drawings at the end of this document for connection details. The connection is RS 232 Half Duplex. The default communication settings are 9600 baud, eight data bits, no parity and one stop bit with no handshaking.

### Correct Firmware

The TIU terminal will only communicate with the IMO K series Automation Equipment (**AE**) if the appropriate firmware has been installed in the TIU. The firmware actually installed is displayed on the front screen of the TIU during "power up".

If new firmware needs installing the appropriate file for the terminal type is required i.e.

Tiu050 = IMO\_R?.0xx

Tiu1xx = IMO\_R?.1xx

Tiu2xx = IMO\_R?.2xx

? = The TIU firmware revision.

### Installing Correct Firmware

The easiest way to install the correct firmware into the TIU terminal is to carry out the following procedure: -  
Select "Configure" / "Terminal type" to select the TIU type and initialise all relevant parameters.  
Select "Configure" / "Communication Settings" and then select the "Manufacturer" and "Model" being used and also check that Communication Mode, Baud Rates and that the correct Network and connection details are all correct. (RS 422 / RS 485).

After all settings are confirmed as correct, select File / Update protocol. When the above has been completed, the computer should have select the correct file to download. Accepting this option will automatically initiate the protocol download to the TIU. The TIU should now be capable of communication with the AE.

### Testing Communications

A "Comms Page Wizard" can be used to quickly establish whether or not communication is working.

Do "Configure / Page Wizard / Comms Stats" and accept the warning screen.

Add a little text similar to the example shown and double-click on the screen to embed a data register e.g. D0. Select an address from within the range. Download this to the TIU using "File / Download".

The Total Counter should be incrementing, as should the Good counter. If Bad or None are occurring then some fault finding will need to be done. Main reasons for this are cables and / or mismatched comms Parameters



## PLC TYPES & REGISTER RANGES

REGISTER TYPE	K10S1	K10S,K30S K60S, K100S	K200H	K500,K1000	Data Type
Data Register	D000-D063	D000-D255	D000-D1024	D000-D9999	RW-16 bit Word
Aux. Relay	M00-M15	M00-M31	M00-M64	M00-M191	RW-16 bit Word
I/O Relay	P00-P01	P00-P06	P00-P11	P00-P63	RW-16 bit Word
Keep Relay	K00-K07F	K00-K15F	K00-K31	K00-K31	RW-16 bit Word
Link Relay	L00-L07F	L00-L15F	L00-L31	L00-L63	RW-16 bit Word
Special Relay *****	F00-F15	F00-F15	F00-F15	F00-F31	RO-16 bit Word
Timer Point (100mS)	T00-T31	T00-T95			RW-Points (bits)
Timer Point (10mS)	T32-T47	T96-T127			RW-Points (bits)
Timer Pre-set T	T00-T47	T00-T127	T00-T255	T00-T255	RO-16 bit Word
Timer Elapsed T	T00-T47	T00-T127	T00-T255	T00-T255	RW-16 bit Word
Counter Point C	C00-C15	C00-C127	C00-C255	C00-C255	RW-Points (bit)
Counter Pre-set C	C00-C15	C00-C15	C00-C255	C00-C255	RO-16 bit Word
Counter Elapsed C	C00-C15	C00-C127	C00-C255	C00-C255	RW-16 bit Word
Step Controller S	S00-S15	S00-S31	S00-S63	S00-S99	RW Range 0-99

RW=Read/Write  
Address 2 bit 3

RO=Read Only

\*\*\*\*\* Address F023 as Special Function

## Retentive Areas

Certain register types have retentive areas as shown below. (Derived from the K series manual)

REGISTER TYPE	K10S1	K10S,K30S K60S, K100S	K200H	K500,K100 0	Data Type
Data Register	D48-D63	D192-D255			RW-16 bit Word
Keep Relay	K00-K07F	K00-K15F			RW-16 bit Word
Link Relay	L00- L07F	L00- L15F			RW-Point (bit)
Special Relay	F00-F15	F00-F15			RO-16 bit Word
Timer Elapsed 100mS	T24-T31	T72-T95			RW-16 bit word
Timer Elapsed 10mS	T44-T47				RW-16 bit word
Counter Elapsed	C12-C15	C96-C127			RW-16 bit Word
Step Controller S	S12 -S15	S24 -S31			RW Range 0-99

## Using Timer and Counter Pre-sets

The pre-set values for timers and counters are normally Read Only with the value embedded in the ladder configuration. If it is necessary to change the pre-set value dynamically from the TIU then a D register needs to be included in the ladder configuration of a timer or counter in place of fixed pre-set value.

e.g **TMR 0030 D005** instead of **TMR 0030 150**

## Addressing “Points” or Bits

The first part of a “Point” identification is a decimal number, the second is an hexadecimal number. The following is an example of how to add a point onto the screen of a TIU.

## Step Controllers

Step Controller data can be read using any of the S Registers within the range of the AE being used. The value returned will be a value 0-99 dependent on the step position.

## Special Function Relays

These are addressed in the TIU as [First number] as main address followed by a [Bit Number]. E.g. Always On (F010) is addressed as Special Function, Address 1 and bit 0 in the TIU embedded data field.

## High Speed Counter

The low word elapsed count on a KS10S1 can be read from F140 (F14 in TIU)  
 The high word elapsed count on a KS10S1 can be read from F150 (F15 in TIU)  
 The corresponding status register on a KS10S1 is F070 (F7 bits 0 to F in TIU).

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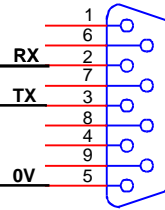
## TIU 100/110

D TYPE RS-232 PORT  
K30S,K60S,K100S,K200H

+5V	1
TX 485/422+	2
TX 485/422-	3
RX 485/422+	4
RX 485/422-	5
TX RS232	6
0V (GND)	7
RX RS232	8
TX 20mA +	9
TX 20mA-	10
RX 20mA+	11
RX 20mA-	12
EARTH	13

RS232

9 Pin Male  
D type (Rear)



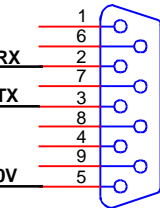
D TYPE RS-232 PORT  
K30S,K60S,K100S,K200H

## TIU 50/101/102/111/112/20X

TX 485/422+	1
TX 485/422-	2
RX 485/422+	3
RX 485/422-	4
TX RS232	5
0V (GND)	6
RX RS232	7
SHIELD	8

RS232

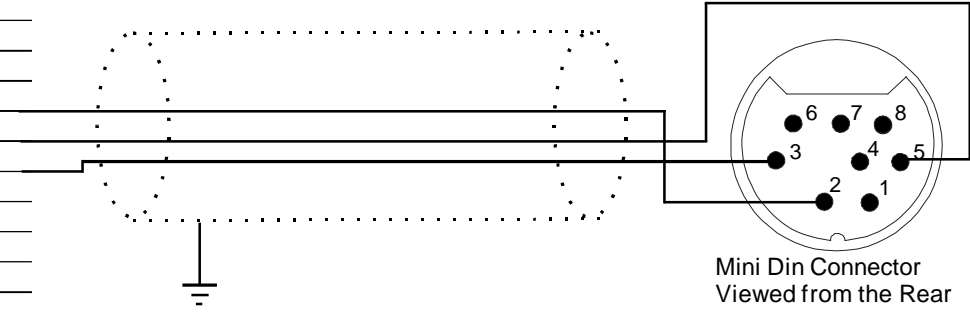
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