



Using the TIU Terminal Range with a DATA TRACK TRACKER 240 series.

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

DATATRACKV1.05 or later -supports master only operation to the slave Weighing Indicator using a decimal version of the MODBUS RTU protocol. Communication to the Weighing Indicator is via the PLC Port on the TIU terminal and the appropriate screw terminals on the Inverter module.

The default settings are 9600 baud, eight data bits, no parity and one stop bit with no handshaking.

The connection is RS 422/485 communications. See attached drawings at the end of this document.

Correct Firmware

The TIU terminal will only communicate with the Weighing Indicator if it has the appropriate firmware has been installed. The firmware installed will be displayed on the front screen of the terminal during "power up".

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

Tiu050 = DATATRACK_R?.0xx

Tiu1xx = DATATRACK_R?.1xx

Tiu2xx = DATATRACK_R?.2xx

? = The TIU firmware revision.

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. If the above has been completed the computer should have selected the correct file to download. Accepting this option will automatically initiate the protocol download to the TIU.

Initial Settings in the Datatrack 240.

In order to communicate to the Weighing Indicator, it is first necessary to set up some parameters from the front panel of the DATATRACK 240.

CoNN will need to be set to Binary Modbus RTU.

Addr will need to match the address used in the configurator.

If a network is required then the Network Enable will need to set in "Configure / Communication Settings" and the appropriate address will then need to be added to each item of data that is embedded on the screen.

Rtu	should be set to ON
Baud	should be set to 0,1,2 03 3 to match the TIU. (1200, 2400, 4800, 9600). Default is 9600
Prot	should be set to OFF to allow changes via RTU communication.
PrtY	should be set to 2 (none) with RTU communication.
StoP	should be set to OFF (1 bit) with RTU communication.

Node Addresses

The addresses of each device can range from 1 to 247 and the default address is 1

Networking several Indicators

The communication interface is RS422 and as such up to 32 Indicators can be connected together on to a network. Each Indicator must have an individual address in a range 1 –247. Only 32 devices should be included on a Network at any one time without repeaters. Using Repeaters is not within the scope of this document.

The Network Option must be enabled from “Configure / Communication Settings / Network Mode Enable”. RS 422 / RS485 option must also be selected. Cabling details are shown at the end of this document Each item of embedded data will need to have the correct node address entered as part of the data set-up screen to indicate which Indicator is to be accessed.

Also the data can be selected to be editable from the TIU and data scaling can be set-up to convert values in the Indicator into engineering units. E.g. Indicator weight in Kilos to weight in imperial pounds. The manual supplied with the DATATRACK 240 shows the register range and definitions.

An example is shown below on how to communicate to register 17CH on Node address 27. Note that Node Addresses are in decimal, register addresses are hexadecimal in decimal in Modbus RTU Dec.

Configure Numeric Embedded Data

Remote Data Source

Remote Node ID: 27

Data Type: Internal Word

Location: 2

Display Format

XXX.XX

16-Bit 32-Bit

Unsigned Signed

Edit/Write

Enabled

Range Checking

Enable

Minimum: 100.00

Maximum: 300.00

Scaling

Enable

TIU Minimum: 0.00 Remote Minimum: 0

TIU Maximum: 220.40 Remote Maximum: 10000

Attributes

Flashing

Broadcasting to multiple indicators simultaneously.

It is possible to send the same data to several Indicators simultaneously E.g. setting multiple Indicators to the same setpoints.

To do this all data must be sent to Node Address 0. Every device on the network will then accept the data. In order to implement WRITE then READ to confirm register values, the TIU will automatically read back from Station 1 Therefore, one of the Indicators on the network must have an address of 1.

If no Address 1 is present on the network, the data field will show ***** and bad communications will occur whilst still trying to access this parameter.

Parameter Range

The parameters are specified as a number. There are two types of data: -

Analogue data returned in words of 16 bits e.g. 1 - the Displayed value.

Logic data returned as simple bits e.g. 34 - UN-tare display.

The full parameter range is implemented. Addresses must be entered using the Modbus Dec address.

A detailed list of the full range of parameters available for this Indicator is not within the scope of this document and reference should be made to the appropriate DATA TRACK manual.

Basic Parameters-

All the addresses use Internal Words or Internal Bits. Where it is necessary to display a 16-bit value then the embedded data for Words should be used. E.g. To display the displayed weight, Internal Word 2 should be used.

Just "double click" at the place here data is to be added to a screen and select the required embedded data type.

Where it is necessary to use a bit condition e.g. FORWARD / REVERSE, the "bit token" embedded data field should be used. Data can then be added as an Internal Word with a bit number or an internal bit number directly.

An example of setting up a "bit token" is as follows: -

Enter basic text e.g. DIRECTION then "Double click" on the TIU screen where the token is to be placed and then select the bit operator. The following dialogue box needs to be completed.

Note that it is not necessary to enter a "Remote Node ID" on a single Inverter set-up.

Configure Bit Status Embedded Data

Remote Data Source

Remote Node ID: 1

Data Type: Internal Word

Location: 1 Bit Number: 1

Display Format

"REVERSE"/"FORWARD" 16-Bit 32-Bit

Edit/Write

Enabled

Attributes

Flashing

Using Recipe for Set point Control

It is possible to set-up a simple recipe structure that will allow selection of an item and load the relevant values into the set point registers 236 and 238 by mapping SP1 to 236 and SP2 to 238.

Select the “Chef’s Hat” symbol and overtype the default page with the required text. Obviously the Record column could contain a sequential table of data that could start at Level 1 and increment to level N for more complex use of the set point feature or where more ingredients are needed.

Field	Record 1	Record 2	Record 3	Record 4
Recipe Name	WHITE	BROWN	GRANARY	BLOOMER
SP 1	200	250	400	323
SP 2	500	500	500	1780

To simplify using and setting up the TIU screens for the Recipe’s, two Page Wizards have been incorporated.

Add a new page with the + ICON and selecting “Configure / Page Wizard / Select Recipe “ and fill in the “Use Field”. This will then structure a page on the TIU that will allow the selection of one of the records (based on the parameter entered in the “Use Field” box) and send it to the set point parameters. The “Use field” selection can be any of the items shown in the “Field” column.

The values within a record can be entered from the configurator by clicking on the required cell.



When configured the Recipe selection page will look something like the example shown above.

- Press SEL to initiate selection of the product.
- Press NEXT or PREV to select the Record or item in the “Use Field” box.
- Press SEND to send the data.

Editing a Recipe

If it necessary to edit the parameters from the TIU, then 2nd Page Wizard will need to be used.

Add a new page with the + ICON and selecting “Configure / Page Wizard / Edit Recipe “ and fill in the “Use Field”. This will then structure a page on the TIU that will allow the selection of one of the records (based on the parameter entered in the “Use Field” box) and then to select individual cells within the record and to edit this cell from the TIU keyboard.

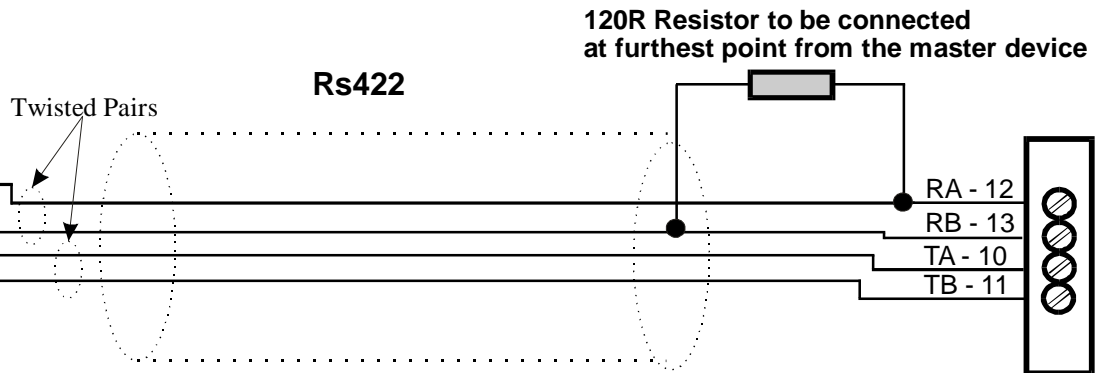


- Press SEL to initiate selection of the product.
- Press NEXT or PREV to select the Record or item in the “Use Field” box.
- Press EDIT to select the first record.
- Press EDIT to step to the correct field for editing.
- Press Up and Down to change data (or use numeric keys) if available.

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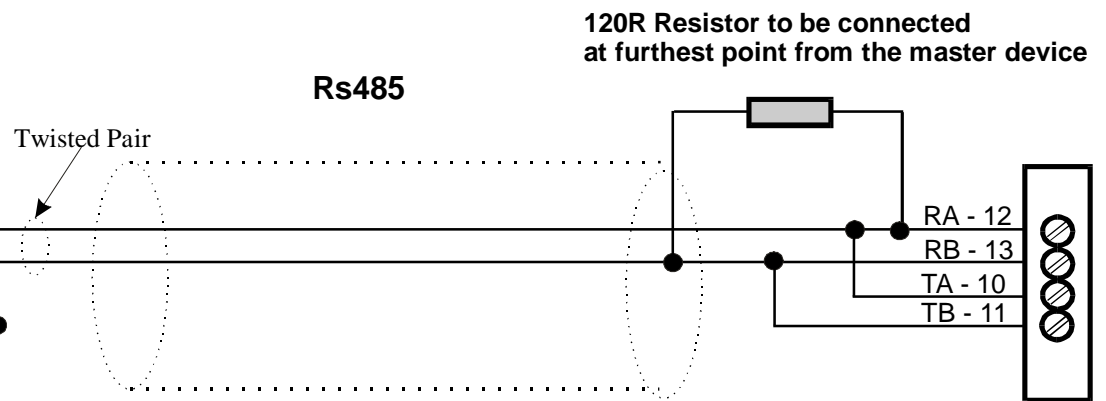
TIU 100/110

+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



TIU 100/110

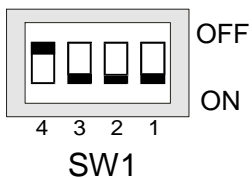
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RX 20mA+	11
RX 20mA-	12
EARTH	13



Configuration Bank

Switch	ON	OFF
1	Pull-up	No Pull-up
2	120 termination	No termination
3	Pull-down	No Pull-down
4	Reserved for future use	

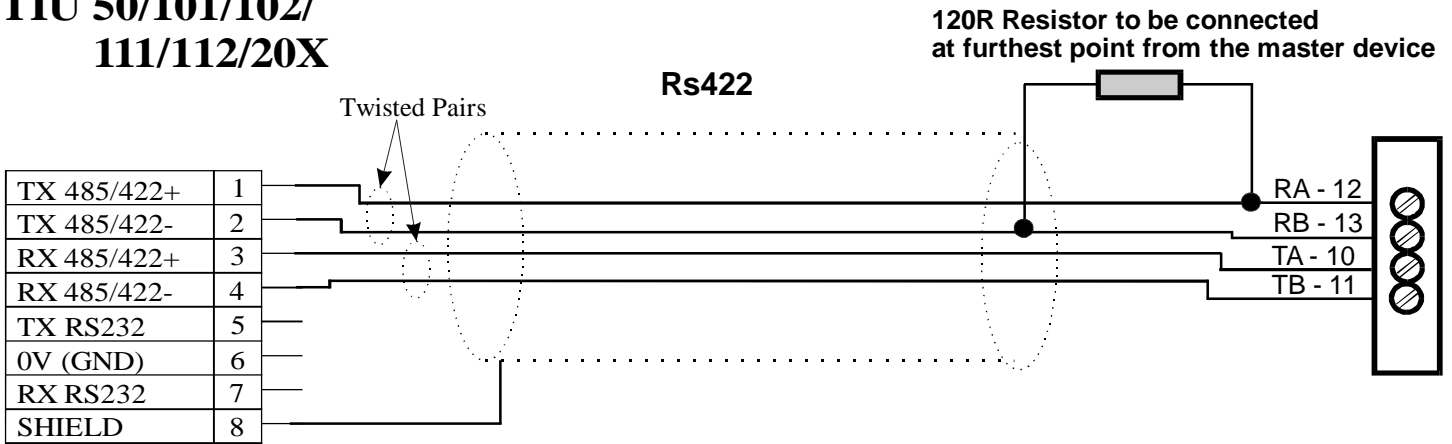
NOTE: Switch 1 and 3 must be used together.



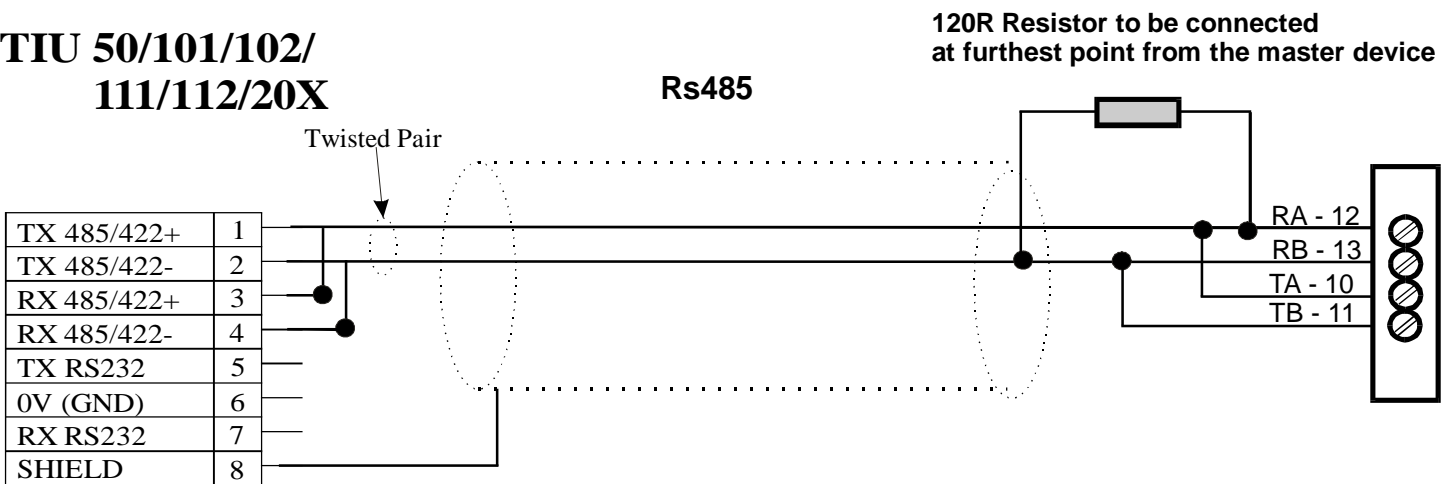
Use Belden or equivalent twisted pair cable. The 120R resistor should be fitted on the last node on the network.

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



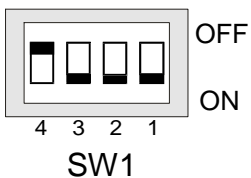
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