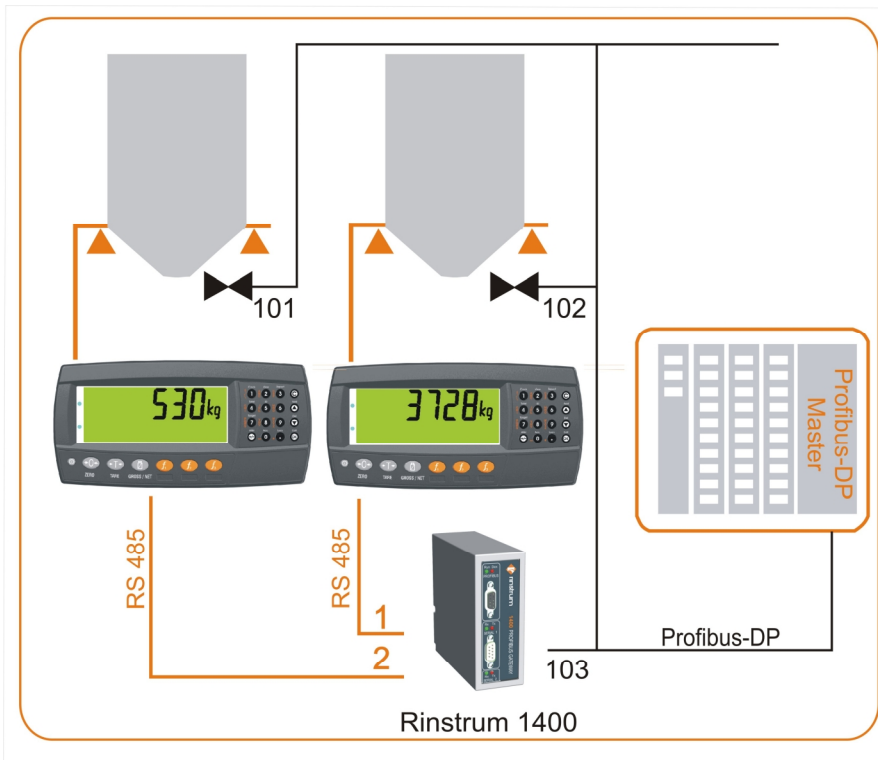


Application Note: Using a 1400 to connect two R420-K401's onto a Profibus network

Application:



A PLC is being used to control valves on feeds into two silos in a water treatment plant, with silos for dosing lime and other chemicals for example. The silos are weighed using R420-K401's that are connected back to a Rinstrum 1400. The PLC controls the valves via the Profibus-DP network. A Profibus-DP network is used to communicate between devices and as such a 1400 is used to translate the information from the Rinstrum indicators into Profibus-DP.

- The indicators can connect to the 1400 using their built in serial port RS485 (SER1B) (the built in RS232 could also have been used).
- The 1400 connects onto the Profibus-DP network back to the Profibus-DP Master.
- The 1400 polls the indicators and the PLC polls the 1400 via the Profibus-DP network.
- The 1400 has an address on the Profibus-DP network

The following information is to be sent from the indicators to the Master (Input Data):

- Current weight
- Status

The following commands need to be sent by the Master to indicators (Output Data):

- Zero
- Read the Gross Weight Register in the indicators

R420 Basic Level Commands are being used as only weight data is required by the Master (12 input bytes and 5 output bytes).

Components:



1400
Profibus-DP Module



R420-K401-A
R42x Indicator VDC



A10010
Power Supply, 12VDC,
2A DIN Rail

*Note1 Either R420s ABS or R423s flush stainless steel housing could be used.

*Note2 The 1400 requires a suitable external power supply

Indicator Configuration

(To enter the setup mode, hold down the **Power** and **F3** key for a few seconds.)

Indicator 1: R420-K401 (or K402) Set up

Indicator Address 1 connected via RS485 using built in port working back to Serial Port 1 on the 1400

H.WARE:SER1.HW	BAUD 19200 PARITY to NONE DATA to 8 STOP to 1 DTR to 0 TERM to ON
SER.NET:TYPE	PROTOCOL.B
SER.NET:SERIAL	SER1B
SER.NET:ADD	1

Indicator 2: R420-K401 (or K402) Set up

Indicator Address 2 connected via RS485 using built in port working back to Serial Port 2 on the 1400

H.WARE:SER1.HW	BAUD 19200 PARITY to NONE DATA to 8 STOP to 1 DTR to 0 TERM to ON
SER.NET:TYPE	PROTOCOL.B
SER.NET:SERIAL	SER1B
SER.NET:ADD	2

1400 Configuration

A Profibus system management tool is needed for administration and maintenance. The management tool allows configuration of the communications and configuration options for the Profibus system, including the master and each of the slave devices. As this management tool is installation dependent it isn't supplied by Rinstrum. A master simulator is one of many suitable devices as it offers a reasonably low cost simple to use interface.

The 1400 has a GSD file associated with it. A GSD provides an electronic data sheet for the 1400 that is used to define the address, slave module types and features.

Basic steps to configure the 1400 GSD (ri05a4.gsd) file

Set 1400 address (note 126 cannot be used it is a setup address only)	103 (in this example)	
	Port 1	Port 2
Set the slave module types	R420 Basic Level	R420 Basic Level
Set "Global" configuration Set Termination Set Baud rates – the baud rate MUST match the indicator set up, in this example 19.2k is being used.	ON 19200 baud	ON 19200 baud
Configure slot data as required - In this example the 1400 has to be configured to read the Gross Weight Register in the R420.	R420 Basic 2 slots I/O status Gross/Net weight	R420 Basic 2 slots I/O status Gross/Net weight

Data Transfer Examples

Input Data - Indicator to Master – Using Format R420 Basic Level Commands

The following information from an indicator would be represented in the table below.

- R420 Indicator at Address 1 connected to Serial Port 1 of the 1400
- The R420:
 - o Has no motion, is in Gross mode, has no over or under load and no errors
 - o Has no I/O
 - o Is displaying 10.0kg,

Input information from the connected Indicators is provided in the following format to the Profibus-DP master.

Bytes 1-12	Description	Example Decimal Value
1	Serial Port Number	1
2	Indicator Address	1
3	Status MSB	00
	Calibration in progress	0
	Range of Zero	0
	Gross	0
	Motion	0
	Centre of Zero	0
	Underload	0
	Overload	0
	Error	0
4	Status LSB	0
5	Configurable Register Slot 1 (MSB 32)	I/O status
6	Configurable Register Slot 1	I/O status
7	Configurable Register Slot 1	I/O status
8	Configurable Register Slot 1 (LSB 32)	I/O status
9	Configurable Register Slot 2 (MSB 32)	Gross/Net weight
10	Configurable Register Slot 2	Gross/Net weight
11	Configurable Register Slot 2	Gross/Net weight
12	Configurable Register Slot 2 (LSB 32)	Gross/Net weight

(Note R420 Advanced uses a further 4 register slots including Grand Total, Product Total, Active Product Id)

Master to Indicator - Output Data – Using Format R420 Basic Level Commands

Example 1

Indicator at Address 1 connected to Serial Port 1 of the 1400 is sent a ZERO function

- Using R420 Basic Level Commands

Format – R420 Basic Level Commands

Bytes 1-5	Description	Decimal Value
1	Serial Port Number	1
2	Indicator Address	1
3	Command	1
	Send Key	Yes
	Set Configurable Register Slot 1	-
	Set Configurable Register Slot 2	-
4	Command Data	11
5	Command Data	0
	Key Code R420 ZERO - 0B _H	

Example 2

Indicator at Address 1 connected to Serial Port 1 of the 1400 is commanded to set configurable register slot 2 to be R420 Gross Weight Register

- Using R420 Basic Level Commands

Format – R420 Basic Level Commands

Bytes 1-5	Description	Decimal Value
1	Serial Port Number	1
2	Indicator Address	1
3	Command	3
	Send Key	-
	Set Configurable Register Slot 1	-
	Set Configurable Register Slot 2	Yes
4	Command Data	0
5	Command Data	70
	R420 Gross Weight Register 0026 _H (MS Byte)	
	R420 Gross Weight Register 0026 _H (LS Byte)	

For more information refer to the Reference Manual for this product