# PLC Configuration Guide

# IND9D57/Dyn-570 Dynamic Weighing Controller





# IND9D57/Dyn-570 Dynamic Weighing System METTLER TOLEDO Service

Essential Services for Dependable Performance of Your IND9D57/Dyn-570 Dynamic Weighing System

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# **1** Overview

This document provides the configuration requirements of the IND9D57 unit that will allow it to work with the provided PLC sample code.

The sample code is divided two ways:

- 1. By Fieldbus. The fieldbuses demonstrated are:
  - a. Ethernet/IP
  - b. ControlNet
  - c. DeviceNet
  - d. PROFIBUS
  - e. PROFINET
- 2. By the type of messaging used
  - a. Cyclic (all 5 fieldbuses)
  - b. Shared Data Access, which is typically accomplished with Acyclic or Explicit messaging, with the following notes:
    - i. DeviceNet has no Acyclic/Explicit messaging capability
    - PROFIBUS is also handled entirely with Cyclic messages. However, a method of accessing Shared Data in the terminal is provided with the terminal, and is used for this sample.

## **1.1. Cyclic Sample Overview**

The cyclic data samples have simpler PLC logic because they take advantage of the cyclic data link between the PLC and the IND957D. But to do this, they require that Outputs 3, 4, and 5 on the IND9D57 be wired back into Input 3 as shown below, so that a new Processed Weight reading, or an error, will trigger the PLC program to go read the current value of the Floating Point data being returned to the PLC.



2. The Solid State Relays (SSR) shown are Crouzet GDS-ODC (84130104)

Figure 1-1: IND570 Dynamic Weighing – Cyclic Data I/O Wiring

The cyclic data sample programs take advantage of the fact that IND9D57 puts the most recent Processed Weight captured into Shared Data Variable AJ0101.

The sample program sends Floating Point Command 17 to the IND9D57, which causes the terminal to return the value for Shared Data Variable AJ0101 in the Floating Point data. The floating point data can then be read when a new Processed Weight is detected (Input 3 goes high) to capture the new Processed Weight.

If the Processed Weight read is a negative value, then this indicates that an error has occurred, and the value returned in the Floating Point data is an error code indicating what the error was.

The IND9D57 also returns an Over/Under/OK status in the Cyclic Data Scale Status word using the Feed, Fast Feed, and Tolerance OK status bits as follows:

- Feed = Under Target Value
- Fast Feed = Value OK
- Tolerance OK = Over Target Value.

## **1.2.** Shared Data Access Sample Overview

Because the Shared Data Access samples can monitor all of the IND9D57's I/O, no additional wiring of the unit is required. However, the PLC logic tends to be more complicated so that it can handle the various methods for Shared Data Access.

The PLC does a composite read of all of the IND9D57's I/O so that the states of the unit's inputs and outputs come back into the PLC about 10 times per second.

The PLC monitors the returned status bit for Output 3. When that bit goes high, the IND9D57 is indicating that a new Processed Weight is available. This triggers the PLC to read Shared Data Variable IW0103 and record this as the Processed Weight.

The PLC also monitors the returned status bits for Outputs 4 and 5, which are the Fatal and Non-Fatal Errors respectively. If either of these bits go high then the error code is read from Shared Data Variable AJ0101.

After a Processed Weight has been Read by the PLC, the Over/Under/Okay status may be read by the PLC by triggering reads of the Shared Data Variables AS0109 (Over), AS0110 (Okay), and AS0111 (Under). The PLC then sets the appropriate Over/Under/Ok flags depending on the results of these reads.

## **1.3. Basic Configuration**

The following Setup configuration of the IND9D57 terminal is recommended for use with the PLC Sample Code. Your actual configuration may vary.

Note that the configuration for the PLC interface is included in the sections for each Interface.

#### 1.3.1. Application

#### 1.3.1.1. Memory

1.3.1.1.1. Target Table

Mode = Over/Under Tolerance Type = Target Deviation Totalization = Disabled

#### 1.3.1.2. Operation

1.3.1.2.1. Target

**Source** = Average Weight

Motion Check = Disabled

#### 1.3.1.2.2. Comparators

No Comparators are defined.

1.3.1.2.3.	Totalization	
	Mode = None.	
1.3.1.2.4.	ID1	
	<b>ID1 Mode</b> = Disabled.	
1.3.1.2.5.	ID2	
	<b>ID2 Mode</b> = Disabled.	
1.3.1.2.6.	ID3	
	<b>ID3 Mode</b> = Disabled.	
1.3.1.2.7.	ID4	
	<b>ID4 Mode</b> = Disabled.	
1.3.1.3.	Discrete I/O	
1.3.1.3.1.	Inputs	
	<b>0.1.4</b> = Silence Alarm	
1.3.1.3.2.	Outputs	
	0.1.1 = Running	
	0.1.2 = Scale Empty	
	0.1.3 = Weigh Complete	
	0.1.4 = Alarm Falar 0.1.5 = Alarm Non-Fatal	
1.3.1.4.	0.1.5 = Alarm Non-Fatal PAC	
<b>1.3.1.4.</b> 1.3.1.4.1.	0.1.5 = Alarm Non-Fatal PAC System	
<b>1.3.1.4.</b> 1.3.1.4.1.	0.1.5 = Alarm Non-Fatal PAC System System Type = Checkweigh	
<b>1.3.1.4.</b> 1.3.1.4.1.	0.1.5 = Alarm Non-Fatal PAC System System Type = Checkweigh Transmit PE3 = Disabled	
<b>1.3.1.4.</b> 1.3.1.4.1.	0.1.5 = Alarm Falai 0.1.5 = Alarm Non-Fatal PAC System System Type = Checkweigh Transmit PE3 = Disabled Transmit Delay = 0 Seconds	
<b>1.3.1.4.</b> 1.3.1.4.1.	0.1.5 = Alarm Falai 0.1.5 = Alarm Non-Fatal PAC System System Type = Checkweigh Transmit PE3 = Disabled Transmit Delay = 0 Seconds Reject = Disabled	
<b>1.3.1.4.</b> 1.3.1.4.1. 1.3.1.4.2.	0.1.5 = Alarm Falai 0.1.5 = Alarm Non-Fatal PAC System System Type = Checkweigh Transmit PE3 = Disabled Transmit Delay = 0 Seconds Reject = Disabled Display	
<b>1.3.1.4.</b> 1.3.1.4.1. 1.3.1.4.2.	0.1.5 = Alarm Falai 0.1.5 = Alarm Non-Fatal PAC System System Type = Checkweigh Transmit PE3 = Disabled Transmit Delay = 0 Seconds Reject = Disabled Display Display Time = 2 Seconds	
<b>1.3.1.4.</b> 1.3.1.4.1. 1.3.1.4.2.	0.1.4 = Aldrin Faldi 0.1.5 = Alarm Non-Fatal PAC System System Type = Checkweigh Transmit PE3 = Disabled Transmit Delay = 0 Seconds Reject = Disabled Display Display Time = 2 Seconds Display Info = Literal	
<b>1.3.1.4.</b> 1.3.1.4.1. 1.3.1.4.2.	0.1.4 = Aldrin Faldi 0.1.5 = Alarm Non-Fatal PAC System System Type = Checkweigh Transmit PE3 = Disabled Transmit Delay = 0 Seconds Reject = Disabled Display Display Time = 2 Seconds Display Literal = Processed Weight	
<b>1.3.1.4.</b> 1.3.1.4.1. 1.3.1.4.2. 1.3.1.4.2.	0.1.4 = Aldrin Faidi 0.1.5 = Alarm Non-Fatal PAC System System Type = Checkweigh Transmit PE3 = Disabled Transmit Delay = 0 Seconds Reject = Disabled Display Display Time = 2 Seconds Display Info = Literal Display Literal = Processed Weight Photoeyes DE 1 Timer = 150 m2	
<b>1.3.1.4.</b> 1.3.1.4.1. 1.3.1.4.2. 1.3.1.4.3.	0.1.4 = Aldrin Faidi 0.1.5 = Alarm Non-Fatal PAC System System Type = Checkweigh Transmit PE3 = Disabled Transmit Delay = 0 Seconds Reject = Disabled Display Display Time = 2 Seconds Display Info = Literal Display Literal = Processed Weight Photoeyes PE 1 Timer = 150 mS DE 2 Timer = 150 mS	
<b>1.3.1.4.</b> 1.3.1.4.1. 1.3.1.4.2. 1.3.1.4.3.	0.1.4 = Aldrin Faidi 0.1.5 = Alarm Non-Fatal PAC System System Type = Checkweigh Transmit PE3 = Disabled Transmit Delay = 0 Seconds Reject = Disabled Display Display Time = 2 Seconds Display Info = Literal Display Literal = Processed Weight Photoeyes PE 1 Timer = 150 mS PE 2 Timer = 50 mS PE 1 to PE2 Timer = 2 Seconds	
<b>1.3.1.4.</b> 1.3.1.4.1. 1.3.1.4.2. 1.3.1.4.3.	0.1.4 = Aldrin Faidi 0.1.5 = Alarm Non-Fatal PAC System System Type = Checkweigh Transmit PE3 = Disabled Transmit Delay = 0 Seconds Reject = Disabled Display Display Time = 2 Seconds Display Info = Literal Display Literal = Processed Weight Photoeyes PE 1 Timer = 150 mS PE 2 Timer = 50 mS PE1 to PE2 Timer = 3 Seconds DE1 & DE2 Maximum = 5 Seconds	

Overview

1.3.1.4.4.	WeighTime & Autotune					
	Weigh Time = 300 mS					
	No Autotune needs to be run for the PLC sample code to work.					
1.3.1.4.5.	Dynamic Adjust					
	Dynamic Adjust = Disabled					
1.3.1.4.6.	Config Error					
	Log Errors = Enabled					
	Send Error Code = Enabled					
	Error String =					
1.3.1.4.7.	ID1 Input					
	Data Type = None					
1.3.1.4.8.	ID2 Input					
	Data Type = None					
1.3.1.4.9.	Alarm Outputs					
	Fatal Alarm Output = Enabled					
	Non-Fatal Alarm Output = Enabled					
	Auto-clear Alarms = Enabled					
1.3.1.4.10.	DYN Target Table					
	Function not required for configuration					
1.3.1.4.11.	Assign I/O					
	No need to use this function if above configuration is followed.					
1.3.1.5.	TaskExpert					
1.3.1.5.1.	Start					
	Task File Name Auto Start					
	1 Dyn_Adv.cpt Enabled					
1.3.1.5.2.	Custom Setup					
	No Configuration					
1.3.2.	Terminal					
1.3.2.1.	Softkeys					
	Softkey 1 = Dynamic Start					
	Softkey 2 = Target Table					

1.3.3.	Comm	Communications			
1.3.3.1.	Connections				
		Port Assignment			
		<b>COM1</b> = Continuous Output			
		COM1 = CTPZ Input			
1.3.3.2.	Serial				
1.3.3.2.1.	COM1				
		<b>Baud</b> = 9600			
		Data Bits = 8			
		Parity = None			
		Flow Control = None			

Interface = RS-232

# 2 EtherNet/IP

## 2.1. PLC Configuration

The PLC used for the Ethernet/IP samples is an Allen-Bradley ControlLogix L-71 processor with a 1756-ENBT module used for interfacing with the Ethernet/IP network. The sample logic was written using RSLogix5000, Version 20, which can easily be upgraded to the newer versions of Studio5000.

To set up communication between the PLC and the IND9D57, use the IND570 AOP as shown below:

S						
😤 🛛 🚽 🖉 Controller Tags						
🖉 🛛 🖂 Controller Fault Handler						
Power-Up Handler						
⊖- 😚 Tasks						
🖕 🤯 MainTask	(	in the second				
🕁 🤹 MainProgram	Select Mod	lule Type				
Unscheduled Programs / Phases						
E- Can Motion Groups	Catalog	Martila Discourse   Enura				
Ungrouped Axes	Catalog	Module Discovery Pavoni	es			
- Cara Add-On Instructions						
- 🔂 Data Types						
😠 📴 User-Defined		570		Clear Filters		Show Filters 🍣
E Strings						
Add-On-Defined		-la - Narahara	Decederation		Mandan	Colorest
Predefined	La Ca	talog Number	Description		vendor	Category
Module-Defined		IND570 Ethemet/IP	Scale Terminal		Mettler-Toledo	Communication
- 🗁 Trends						
- 🔄 I/O Configuration						
📥 🛲 1756 Backplane, 1756-A7						
0] 1756-L71 IND9D57_ENET_SD4_520_V01						
[1] [2] 1756-ENBT/A Ethernet IP						
Ethernet						
— 1756-ENBT/A Ethernet_ Discover Modules						
IND570 Ethernet/IP/A IN V Cut						
UM Copy Ctrl+C						
Paste Ctrl+V						
Delete Del						
Cross Reference Ctrl+E						
Properties Alt+Er	r					
Print				m		
FINA						
	1 of	454 Module Types Found				Add to Favorites
	V C	lose on Create			Create	Close Help

Figure 2-1: Module Setup

- 1. Right Click on the Ethernet/IP Bridge Module.
- 2. Select "New Module"
- 3. Type "IND570" into the search box, then double-click on the IND570 AOP in the search results.

General Conne Type: Vendor: Parent: Name: Description:	ction Module Info Ve IND570 Ethernet/IP Sc Mettler Toledo Ethernet_IP_Port IND9D57	ndor ale Terminal	Ethernet Address Private Network: IP Address: Host Name:	192.168.1.	
Module Defini Series: Revision: Electronic Key Connection: Oata Format: Number of S	A 2.001 ving: Compatit DATA Float lots: 1	Change	Module Definition Seriess Revision: Electronic Keying: Connection: Data Format: Number of Slots:	A 2 Compatible Module DATA Float 1	
			ОК	Cancel	нер

Figure 2-2: Module Definition

## 2.2. IND9D57 Setup

- 2.2.1. Communications
- 2.2.1.1. PLC configuration
- 2.2.1.1.1. Ethernet/IP

DHCP Client = Disabled

IP Address = 192.168.0.61

Subnet Mask = 255.255.255.0

Gateway = 0.0.0.0

2.2.1.1.2. Data Format

Operating Mode = Compatibility Mode Format = Floating Point Byte Order = Word Swap Message Slots = 1

# 3 ControlNet

## **3.1. PLC Configuration**

The PLC used for the ControlNet samples is an Allen-Bradley ControlLogix L-71 processor with a 1756-CNBR module used for interfacing with the ControlNet network. The sample logic was written using RSLogix5000, Version 20, which can easily be upgraded to the newer versions of Studio5000.

The IND9D57 uses a Generic ControlNet Module in the PLC, which is configured as follows:

Module Properties Report: CNET (CONTROLNET-MODULE 1.1)									
General Connection Module Info									
Туре:	CONTROLNET-MODULE Generic ControlNet Module								
Parent:	CNET Connection Parameters Assembly Instance: Size:								
Name:	IND9D57	Input:	100	6	🚔 (16-bit)				
Description:	*	Output:	150	4	膏 (16-bit)				
	Ψ.	Configuration:	1	0	🚔 (8-bit)				
Comm Format:	Data - INT 👻	Status Input:							
Node:	3	Status Output:							
Status: Offline	ОК	Cancel	Apply		Help				

Figure 3-1: Module Properties

ControlLogix requires additional configuration using RSNetworx for ControlNet. A configuration file named Test.xc is included with the sample code. The connection must be scheduled by RSNetworx before the PLC will communicate with the IND9D57.

## 3.2. IND9D57 Setup

- 3.2.1. Communications
- 3.2.1.1. PLC configuration
- 3.2.1.1.1. ControlNet

Node Address = 3

3.2.1.1.2. Data Format

**Operating Mode** = Compatibility Mode

Format = Floating Point

Byte Order = Word Swap

Message Slots = 1

# 4 **DeviceNet**

DeviceNet does not have Acyclic messaging capability, or any way to allow the PLC to access Shared Data within the IND9D57. So, there is only a Cyclic Data example.

## 4.1. PLC Configuration

The PLC used for the DeviceNet samples is an Allen-Bradley ControlLogix L-71 processor with a 1756-DNB module used for interfacing with the DeviceNet network. The sample logic was written using RSLogix5000, Version 20, which can easily be upgraded to the newer versions of Studio5000.

Module Properties Report: Local:4 (1756-DNB 7.1)						
General Conn	ection RSNetWorx Module Info Scan List Backplane					
Туре:	1756-DNB 1756 DeviceNet Scanner					
Vendor:	Allen-Bradley					
Name:	DNET Input Size: 24 🚔 (32-bit)					
Description:	Output Size: 24 🚔 (32-bit)					
	→ Status Size: 32 → (32-bit)					
Node: Revision:	0					
Status: Offline	OK Cancel Apply Help					

The 1756-DNB module is configured as follows:

Figure 4-1: 1756-DNB Module Configuration

DeviceNet requires additional configuration using RSNetworx for DeviceNet. A configuration file named DNET.dnt is included with the sample code. The connection must be set up by RSNetworx before the PLC will communicate with the IND9D57.



Figure 4-2: Connection Setup

Figure 4-3 shows the I/O mapping:

📲 1756-DNB	ेड्ड 1756-DNB २ 💌
General   Module   Scanlie Input Output   ADR   Summary	General   Module   Scanlist   Input Output ADR   Summary
Node   ✓   Type   Size   Map   AutoMap     Image: Map   01, MT Polled   8   1:1.Data[0].0   AutoMap	Node   /   Type   Size   Map   AutoMap     ⊡-   □1, MT   Polled   8   1:O.Data[0].0   AutoMap
Unmap	Unmap
Advanced	Advanced
< Options	Coptions
Memory: Assembly Data 💌 Start DWord: 0 🚊	Memory: Assembly Data 💌 Start DWord: 0 📫
Bits 31 - 0 01. MT IND-DNET   1:1.Data[0] 01. MT IND-DNET   1:1.Data[1] 01. MT IND-DNET   1:1.Data[2] 11.Data[3]   1:1.Data[4] 11.Data[5]   1:1.Data[6] 11.Data[7]   1:1.Data[8] ▼	Bits 31 - 0   0   0   MT IND-DNET     1:0. Data[0]   01, MT IND-DNET   0<
OK Cancel Apply Help	OK Cancel Apply Help

Figure 4-3: I/O Mapping

# 4.2. IND9D57 Setup

- 4.2.1. Communications
- 4.2.1.1. PLC configuration
- 4.2.1.1.1. DeviceNet

Node Address = 1

Data Rate = 250 KBaud

4.2.1.1.2. Data Format

**Operating Mode** = Compatibility Mode

Format = Floating Point

Byte Order = Word Swap

# 5 PROFIBUS

## 5.1. PLCs used for samples

Two PLCs are used for the PROFIBUS samples. An S7-315-2PN/DP, and an S7-1200C-AC/DC/RLY. There are a total of six (6) PROFIBUS samples for these two PLC, organized as follows

- 1. S7-315-2PN/DP
  - a. Classic Step 7, V5.5
    - i. Cyclic Data Access
    - ii. Shared Data Access via Cyclic Messaging.
  - b. TIA Portal V13
    - i. Cyclic Data Access
    - ii. Shared Data Access via Cyclic Messaging.
- 2. S7-1200C-AC/DC/RLY with a 1243-5 PROFIBUS Master module
  - a. TIA Portal V13
    - i. Cyclic Data Access
    - ii. Shared Data Access via Cyclic Messaging.

## 5.2. Notes on Shared Data Access with PROFIBUS

The IND9D57 implements PROFIBUS DP-VO, which means that Acyclic messages are not supported. To access Shared Data, a region of the allocated I/O space for the unit is used to request Read or Write Access, and to receive the results (see the shaded areas in the diagram below).



\* SD refers to Shared Data

Figure 5-1: Floating Point Mode with Shared Data Access

This shaded area shown in Figure 5-1 always appears after the regions allocated for the Scale I/O. As a result, the **Shared Data Access** version of the programs will always use the "I/O 28 Wrd" selection from the Hardware Catalog of the Programming Tool, regardless of how many Message Slots have been defined for the unit.

The **Cyclic Data Access** versions of the program do not need to access Shared Data. So, they use the "**I/O 4 Wrd**" selection from the Hardware Catalog, which is the I/O definition required to interface with an IND9D57 set up for a Single Message Slot using Floating Point communications.

For these reasons, the PLC communication configurations between the Cyclic Data Access and the Shared Data Access versions of the program will be different.

# 5.3. IND9D57 Cyclic Data Access Setup in the PLC

The following figures show the setup for Cyclical Data Access in the PLC.

📴 HW Config - [SIMATIC 300 Station (Configuration) IND570_PBUS_Dyn_CYC_V01]	
🖏 Station Edit Insert PLC View Options Window Help	_ 8 X
D # 2~ 8 \$ 6 \$ 0 6 \$ 1 m m m 1 \$ 7	
Image: Series	End: End: Profile: Standard Profile: Standard
Press F1 to get Help.	





Figure 5-3: S7-315, TIA Portal, V13



Figure 5-4: S7-1200, TIA Portal, V13

## 5.3.1. IND9D57 Setup Menu

#### 5.3.1.1. Communications

5.3.1.1.1. PLC

PROFIBUS

Node = 3

Shared Data = Disabled

#### Data Format

**Operating Mode** = Compatibility Mode

Format = Floating Point

**Byte Order** = Byte Swap

Message Slots = 1

# 5.4. IND9D57 Shared Data Access Setup in the PLC

The following figures show the setup for Shared Data Access in the PLC.

HW Config - [SIMATIC 300 Station (Configuration) IND570_PBUS_Dyn_SDA_V01]							
UNI Station Edit Insert PLC View Options Win	dow Help						- 8 ×
[ ] D 🕼 🐎 🔍 🥵   🚳 👘   🏙 🏙   🚯 🗆	∃ 😤 N?						
				^			ㅋㅋㅋ
25(0) UR				=	End		ntni
1 2. III COU215 2 DN/DP(1)		PROFIBUS	1); DP master system (1)		Durley	Renderd	
XI MP//DP					Flotte.	Istandard	-
X2			13) IND 570		0 P 9	Additional Field Devices	^
X2 P1 Pot 1 y2 P2 Pot 2						E-T ACT350	
3 -			1111			🗉 🚡 IND141	-
	Etheme	t(1): PROFINE	T-IO-System (100)				
						- Universal module	
						- 1/0 2 Wrd	
				· _		- 1/0 4 Wrd	
(3) IND570						- 1/0 8 Wrd	
	1	1	1	-		- 1/0 12 Wrd	
Slot DPID Order Number / Designation	I Address	Q Address	Comment			- 1/0 16 Wrd	
2 124/7	-	236281		_		/0 19 Wid	
3 164V -> 1/0 28 Wid	256287	ACC11677				- 1/0 21 Wrd	
4 1.24/ -> 1/0 28 Wid	288311					- 🚺 1/0 22 Wrd	
						- 1/0 23 Wrd	
						1/0.28 Wed	
Press F1 to get Help.							4.

Figure 5-5: S7-315 Step 7, V5.5







Figure 5-7: S7-1200, TIA Portal, V13

## 5.4.1. IND9D57 Setup Menu

#### 5.4.1.1. Communications

5.4.1.1.1. PLC

PROFIBUS

Node = 3

Shared Data = Enabled

Data Format

**Operating Mode** = Compatibility Mode **Format** = Floating Point

Byte Order = Byte Swap

Message Slots = 1

# 6 **PROFINET**

## 6.1. PLCs used for samples

Two PLCs are used for the PROFINET samples. An S7-315-2PN/DP, and an S7-1200C-AC/DC/RLY. There are a total of six (6) PROFINET samples for these two PLC, organized as follows

- 1. S7-315-2PN/DP
  - a. Classic Step 7, V5.5
    - i. Cyclic Data Access
    - ii. Shared Data Access via Acyclic Messaging.
  - b. TIA Portal V13
    - i. Cyclic Data Access
    - ii. Shared Data Access via Acyclic Messaging.
- 2. S7-1200C-AC/DC/RLY with a 1243-5 PROFIBUS Master module
  - a. TIA Portal V13
    - i. Cyclic Data Access
    - ii. Shared Data Access via Acyclic Messaging.

## 6.2. Notes on Shared Data Access with PROFINET

We will provide a brief description for how Shared Data Access is accomplished in this section. For details about how the IND9D57 accesses Shared Data over PROFINET, please review the IND570 PLC Manual's (30205335\_R03\_IND570\_PLC\_EN.pdf) Shared Data Access starting at section 7.10.3.

Shared Data is accessed using what Mettler Toledo terms the "Indirect Access" method. The message functions always use the same Message Index numbers (1, 2, and 3) for Shared Data Accesses. The desired Shared Data Value is specified in the first four words of the message itself by putting in the Class, Instance, Attribute, and length of the desired variable (found in the IND570's Shared Data Reference Manual, 30205337\_R01\_IND570\_SDREF\_EN.pdf).

#### 6.2.1. Shared Data Writes

Data is written to the IND9D57 using a WRREC function (SFB53) with Index = 1. The data to be written should immediately follow the header data that specifies what shared data variable it is to be written to.



Figure 6-1: Shared Data Write

### 6.2.2. Shared Data Reads

Data is read from the IND9D57 with a two-step process.

- 1. Use a WRREC (SFB53) function with **Index =2** to send the Class, Instance, Attribute, and Length of the variable requested to be read.
- Use a REREC (SFB52) with Index = 3 to read the data from the requested Shared Data Variable. The PLC program should compare the returned Class, Instance, and Attribute with the requested variable to ensure that the data is from the correct source.
- Note: If the PLC program needs to read the same Shared Data Variable repeatedly, with no other Shared Data accesses occurring in between, then after the initial read only Step 2 is needed because the IND9D57 remembers the last Shared Data variable that was accessed, and always returns the current data for that value until a new request comes in.



Figure 6-2: Shared Data Read

# 6.3. IND9D57 Setup in the PLC

The following figures show setup in the PLC. Note that the configuration will be the same in the PLC for either Cyclic Data Access or Shared Data Access.



Figure 6-3: S7-315 Step 7, V5.5



Figure 6-4: S7-315, TIA Portal, V13

IND9D57_1200_PNET_Dyn_CYC_ST13_V01 → Devices & netwo	orks	_ <b>=</b> = ×
	🛃 Topology view 🛛 🛔 Network view	Device view
Network 🔛 Connections HMI connection 💌 🕎 🖽	0, ±	<b>3</b>
		^
PLC_1	IND570	
	PLC 1	
		-
PROFIBUS_1: 2	PN/IE_1: Using a different method	
PN/IE_1: 172.18.55.225 PN/IE_1		



Figure 6-5: S7-1200, TIA Portal, V13

## 6.4. IND9D57 Setup Menu

- 6.4.1. Communications
- 6.4.1.1. PLC

PROFINET

IP Assignment = DCP IP Address = 172.18.55.128\* Subnet Mask = 255.255.254.0\* Gateway Address = 172.18.54.1\* Device Name = ind570\*

\* Indicates Assigned by PLC's DCP system.

Data Format

Operating Mode = Compatibility Mode Format = Floating Point Byte Order = Byte Swap Message Slots = 1

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