

PACSystems™ RSTi-EP

CONTROLLERS PERFORMANCE EVALUATION MANUAL

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Chapter 1: Preface

This document covers typical use case scenarios that demonstrate the Ethernet capabilities of RSTi-EP Controllers EPSCPE100/115. Each chapter will provide an overview of a system's configuration, followed by a synopsis of the controller's performance for the express purpose of aiding integrators and application engineers design end-user-specific applications that leverage the EPSCPE100/115. Further details of each configuration will be in Appendices A and B.

A given feature may not be implemented on all PACSystems RSTi-EP Controllers. To determine whether a feature is available for specific firmware version, please refer to the Important Product Information (IPI) document provided with the product. Please see IPI document GFK-3013, for more information regarding controllers CPE100 and CPE115.

1.1 Revisions in this Manual

This revision of the PACSystems RSTi-EP Controllers Performance Evaluation document covers the following:

Rev	Date	Description
B	Feb 2020	<ul style="list-style-type: none"> Following Emerson's acquisition of this product, changes have been made to apply appropriate branding and registration of the product with required certification agencies. No changes to material, process, form, fit or functionality. Added DNP3 Performance for EPSCPE115.
A	Aug 2019	Introduction of typical use-cases and performance specifications for RSTi-EP Controllers EPSCPE100/115.

1.2 PACSystems Documentation

PACSystems Manuals

PACSystems RX3i and RSTi-EP CPU Reference Manual	GFK-2222
PACSystems RX3i and RSTi-EP CPU Programmer's Reference Manual	GFK-2950
PACSystems RX3i and RSTi-EP TCP/IP Ethernet Communications User Manual	GFK-2224
PACSystems TCP/IP Ethernet Communications Station Manager User Manual	GFK-2225
C Programmer's Toolkit for PACSystems	GFK-2259
PAC Machine Edition Logic Developer Getting Started	GFK-1918
PAC Process Systems Getting Started Guide	GFK-2487
PACSystems RXi, RX3i, and RSTi-EP Controller Secure Deployment Guide	GFK-2830
PACSystems RX3i & RSTi-EP PROFINET I/O Controller Manual	GFK-2571
PACSystems DNP3 Outstation User Manual	GFK-3103

RX3i Manuals

PACSystems RX3i System Manual	GFK-2314
PACSystems RX3i Ethernet Network Interface Unit User's Manual	GFK-2439
PACSystems RX3i PROFINET Scanner Manual	GFK-2737
PACSystems RX3i CEP PROFINET Scanner User Manual	GFK-2883
PACSystems RX3i Serial Communications Modules User's Manual	GFK-2460
PACSystems RX3i Genius Communications Gateway User Manual	GFK-2892

In addition to these manuals, datasheets and product update documents describe individual modules and product revisions. The most recent PACSystems documentation is available on the Emerson support website <https://www.emerson.com/Industrial-Automation-Controls/support>.

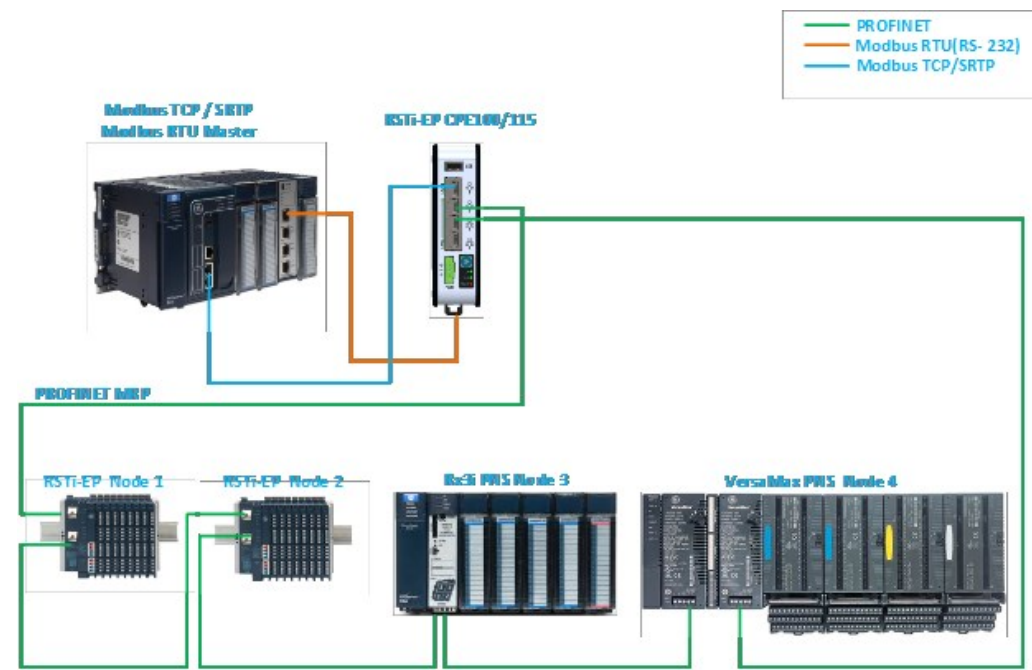
Chapter 2: Discrete Automation Applications

This section is intended to demonstrate a discrete automation use case for the RSTi-EP Controller EPSCPE100/115. This section will provide four configurations along with controller performance measurements.

2.1 Configuration Example 1

In this application, the RSTi-EP Controller's PROFINET LAN is connected to four PROFINET nodes with MRP enabled. The controller is also connected to a Modbus RTU Master via a RS-232 serial connection.

Figure 1: Sample 1 – Discrete Automation Solution Using RSTi-EP controller



The PROFINET LAN is configured with PROFINET nodes. The I/O Scan is set to Normal Sweep mode and all communication settings are set to default values. The PROFINET nodes are connected through MRP with four different PNS nodes (two EPXPNS001, one RX3i PNS001, and one VersaMax PNS001). All the nodes contain I/O modules with various combinations of discrete 4/8/16 point I/O modules and analog 4/8 channels I/O modules. Each I/O module has its outputs tied to the inputs of an adjoining I/O module. The performance data is shown under section 2.1.1. Additional details about the individual PROFINET nodes are available in the Appendix A:

PROFINET System Configuration (MRP Enabled)				
PROFINET DEVICE	Total # of PROFINET I/O Modules	Total # of PROFINET I/O Discrete points/Analog Channels	UPDATE RATE (ms)	I/O BYTES
Node 1: EPXPNS001	64	276/230	32	713
Node 2: EPXPNS001	18	16/99	32	317
Node 3: RX3i PNS001	3	64/6	32	53
Node 4: VERSAMAX PNS2	2	0/19	32	62
Total	87	356/354		1145

The embedded Ethernet LAN port is configured with Modbus TCP Server protocol with configuration parameters as shown in the below table. The loopback time is measured between the Server read and write values.

Number of Configured Channels	
Modbus TCP	2
SRTP	4
Modbus RTU	1 (RS-232)

MODBUS TCP Configuration	
DEVICE	SERVER BYTES
Server Read	150
Server Write	150
Total Bytes	300

The controller is simultaneously connected to a Modbus RTU Master via a RS-232 serial connection. The RTU Master (RX3i CMM004) is set at a baud rate of 115.2 Kbps. The loopback time is measured between the Holding Register and Input Register and between the Input Discrete and Coil. The configuration parameters are as shown in the below table.

Modbus RTU Slave Configuration: RS-232 at 115200 Baud	
Modbus Register Type	No of Bytes
HOLDING REGISTER	32
INPUT REGISTER	32
INPUT DISCRETE	64
COIL	64
Total Bytes	144

2.1.1 Performance Measurement

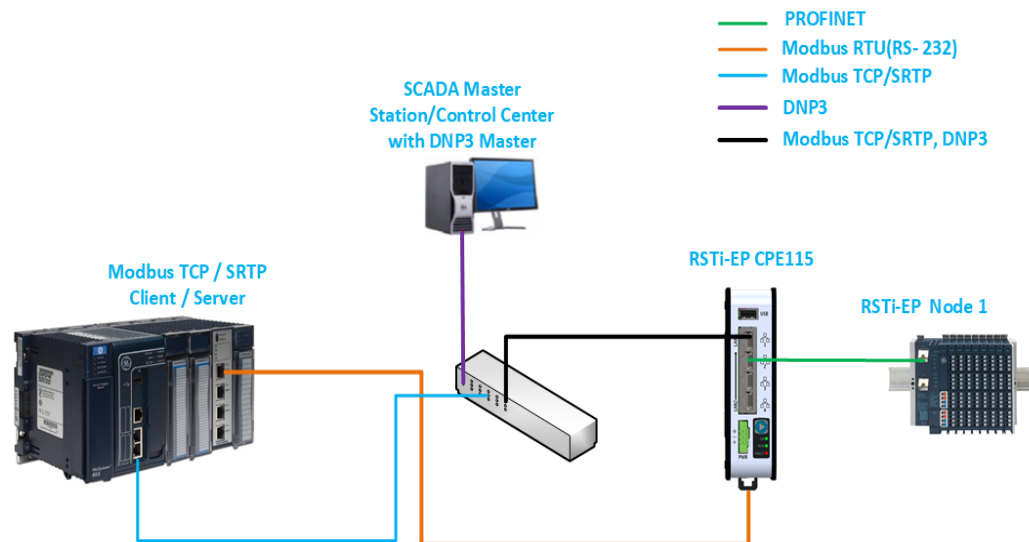
Typical and Max I/O loopback times are calculated as a mean of the analog and discrete loopback times across all four nodes (See below).

Measurements	Typical Time (ms)	Max Time (ms)
RSTi-EP Controller Sweep Time	10	17
PROFINET Discrete I/O Loopback Time	62	90
PROFINET Analog I/O Loopback Time	70	101
Modbus Server Loopback Time	31	58
RTU Slave Loopback Time	106	235

2.2 Configuration Example 2

In this application, the RSTi-EP Controller's PROFINET LAN is connected to a PROFINET node. The controller is also connected to a Modbus RTU Master via a RS-232 serial connection and eight DNP3 Masters.

Figure 2: Sample 2 – Discrete Automation Solution Using RSTi-EP controller



The PROFINET LAN is configured with PROFINET node. The I/O Scan is set to Normal Sweep mode and all communication settings are set to default values. Profinet node contains I/O modules with various combinations of discrete 4/8/16 point I/O modules and analog 4/8 channels I/O modules. Each I/O module has its outputs tied to the inputs of an adjoining I/O module. The performance data is shown under section 2.2.1. Additional details about the individual PROFINET nodes are available in the Appendix A:

PROFINET System Configuration (MRP Enabled)				
PROFINET DEVICE	Total # of PROFINET I/O Modules	Total # of PROFINET I/O Discrete points/Analog Channels	UPDATE RATE (ms)	I/O BYTES
Node 1: EPXPNS001	4	32/8	32	36

The embedded Ethernet LAN port is configured with Modbus TCP Server protocol with configuration parameters as shown in the below table. The loopback time is measured between the Server read and write values.

Number of Configured Channels	
Modbus TCP	2
SRTP	2
Modbus RTU	1 (RS-232)
Number of DNP3 masters	8

MODBUS TCP Configuration	
DEVICE	SERVER BYTES
Server Read	150
Server Write	150
Total Bytes	300

The controller is simultaneously connected to a Modbus RTU Master via a RS-232 serial connection. The RTU Master (RX3i CMM004 is set at a baud rate of 115.2 Kbps. The loopback time is measured between the Holding Register and Input Register and between the Input Discrete and Coil. The configuration parameters are as shown in the below table.

Modbus RTU Slave Configuration: RS-232 at 115200 Baud	
Modbus Register Type	No of Bytes
HOLDING REGISTER	32
INPUT REGISTER	32
INPUT DISCRETE	64
COIL	64
Total Bytes	144

The controller is simultaneously connected to eight DNP3 Masters. The configuration parameters for DNP3 are as shown in the below table.

Number of DNP3 Master Connected-8	
Points (Register) Type	No of Points Connected
Discrete Input (DI)	1024
Discrete Output (DO)	1024
Binary Output Command object (CROB)	1024
Analog Input (AI)	2000

Analog Output (AO)	2000
Analog Output Status object	1000
Total Bytes	10384

2.2.1 Performance Measurement

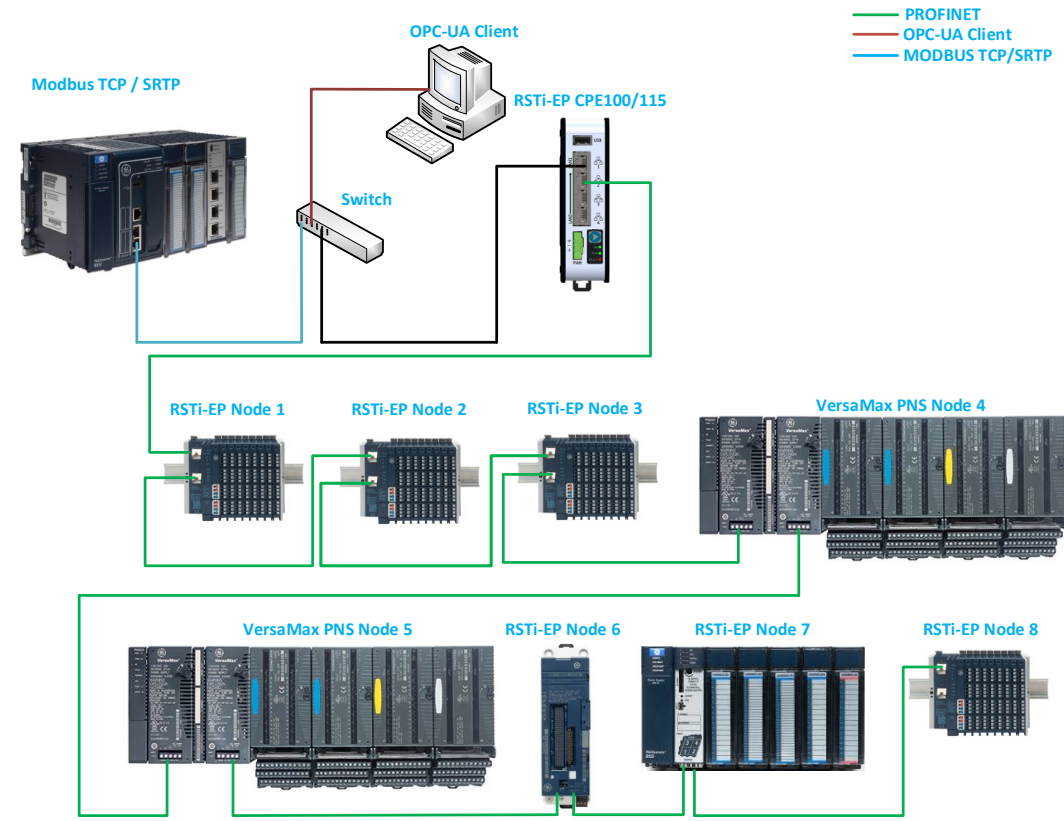
Typical and Max I/O loopback times are calculated as a mean of the analog and discrete loopback times (See below).

Measurements (with 200ms & 500ms Watchdog timer)	Typical Time (ms)	Max Time (ms)
RSTi-EP Controller Sweep Time	8	45
PROFINET Discrete I/O Loopback Time	60	80
PROFINET Analog I/O Loopback Time	57	76
Modbus Server Loopback Time	69	116
RTU Slave Loopback Time	101	218

2.3 Configuration Example 3

In this application, the RSTi-EP Controller's PROFINET LAN is connected to eight PROFINET nodes, and the embedded Ethernet LAN is connected to a SRTP Master & an OPC-UA Client.

Figure 3: Sample 3 – Discrete Automation Solution Using RSTi-EP controller



The PROFINET LAN is configured with PROFINET nodes. The I/O Scan is set to Normal Sweep mode and all communication settings are set to default values. The PROFINET nodes are connected to eight different PNS nodes (four EPXPNS001, one RX3i PNS001, one RX3i CEP001, and two VersaMax PNS001). All the nodes contain I/O modules with various combinations of discrete 4/8/16 point I/O modules and analog 4/8 channels I/O modules. Each I/O module has its outputs tied to the inputs of an adjoining I/O module. Additional details about the individual PROFINET nodes are available in Appendix A.

PROFINET System Configuration				
PROFINET DEVICE	Total # of PROFINET I/O Modules	Total # of PROFINET I/O Discrete points/Analog Channels	UPDATE RATE (ms)	I/O BYTES
Node 1: EPXPNS001	64	276/230	16	713
Node 2: EPXPNS001	18	16/99	16	317
Node 3: EPXPNS001	4	32/8	16	36
Node 4: VERSAMAX PNS1	1	32/0	16	29
Node 5: VERSAMAX PNS2	2	0/19	16	62
Node 6: RX3i CEP001	2	64/0	16	36
Node 7: RX3i PNS001	3	64/6	16	53
Node 8: EPXPNS001	3	32/0	16	20
Total	97	506/362		1266

The embedded Ethernet LAN port is configured with SRTP Server protocol with configuration parameters as shown in the below table. The loopback time is measured between the Server read and write values.

Number of Configured Channels	
Modbus TCP	2
SRTP	2
Modbus RTU	1 (RS-232)
OPC-UA	1

SRTP Configuration	
DEVICE	SERVER BYTES
Server Read	50
Server Write	50
Total Bytes	100

The controller is simultaneously connected with an OPC-UA Client with one session and one subscription. There are 492 published variables and the publishing interval is set to 500 ms.

2.3.1 Performance Measurement

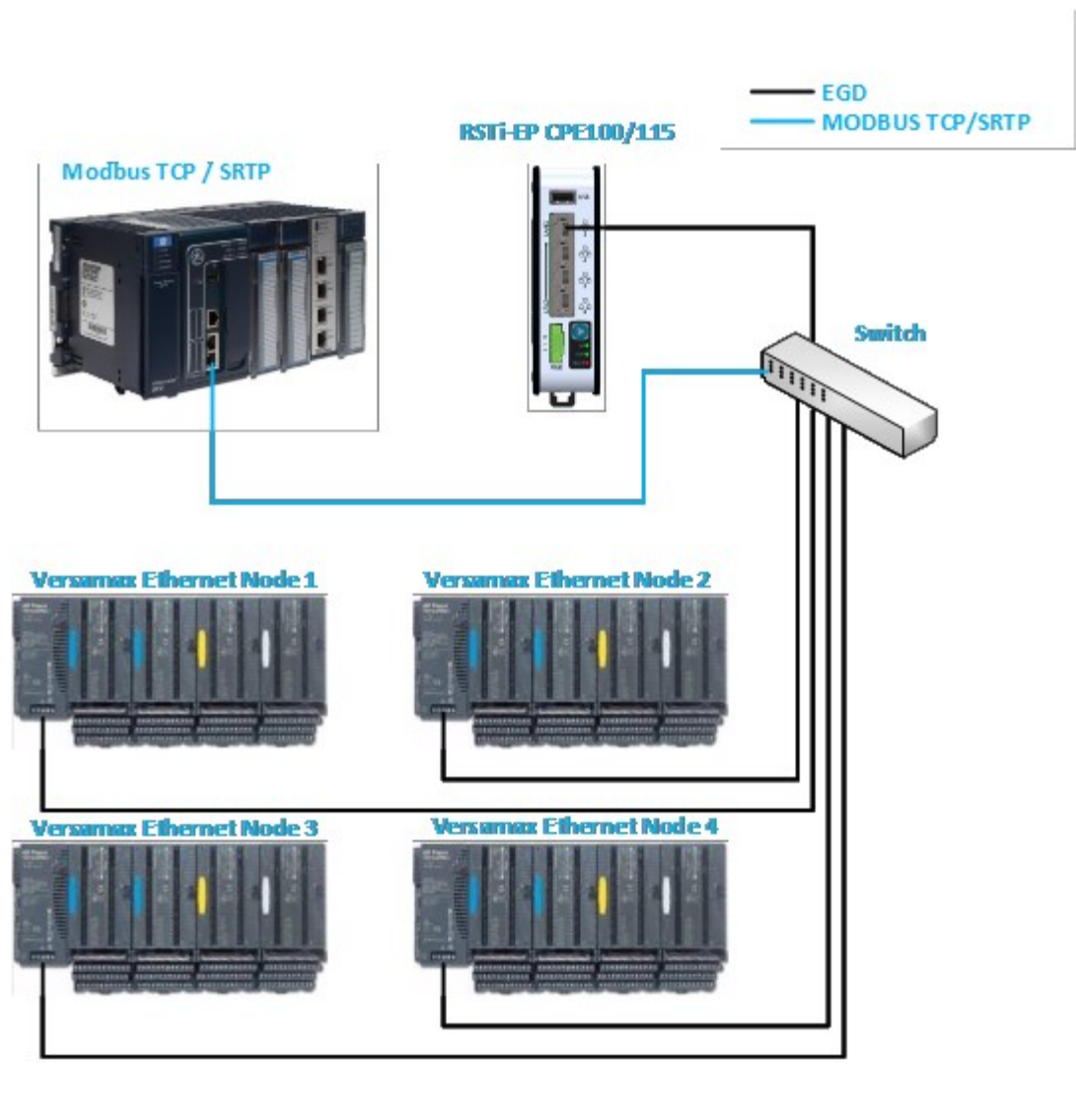
Typical and Max I/O loopback times are calculated as a mean of the analog and discrete loopback times across all eight nodes.

Measurements	Typical Time (ms)	Max Time (ms)
RSTi-EP Controller Sweep Time	16	24
PROFINET Discrete I/O Loopback Time	54	78
PROFINET Analog I/O Loopback Time	64	87
S RTP Server Loopback Time	62	105

2.4 Configuration Example 4

In this application, the RSTi-EP controller’s embedded Ethernet LAN is configured with two Modbus Server channels, four EGD Producers, and four EGD Consumers.

Figure 4: Sample 4 – Discrete Automation Solution Using RSTi-EP controller



The system EGD configuration is shown in the below table:

EGD System Configuration			
CPE100/CPE115 EGD	Consumed / Produced Period (ms)	BYTES	DEST. TYPE
Consumer 1	200 (Def)	57	
Consumer 2	200 (Def)	26	
Consumer 3	200 (Def)	19	
Consumer 4	200 (Def)	4	
Producer 1	20	65	Unicast
Producer 2	20	18	Unicast
Producer 3	20	4	Unicast
Producer 4	20	17	Unicast
Total Bytes		210	

The embedded Ethernet LAN port is configured with a Modbus TCP Server protocol with configuration parameters as shown in the below table. The loopback time is measured between the Server read and write values.

MODBUS TCP Configuration	
DEVICE	SERVER BYTES
Server Read	150
Server Write	150
Total Bytes	300

2.4.1 Performance Measurement

Typical and Max EGD loopback times are calculated as a mean of the analog and discrete loopback times across all four Versamax EBI nodes.

Measurements	Typical Time (ms)	Max Time (ms)
RSTi-EP Controller Sweep Time	5	15
EGD Loopback Time	43	69
Modbus TCP Server Loopback Time	36	71

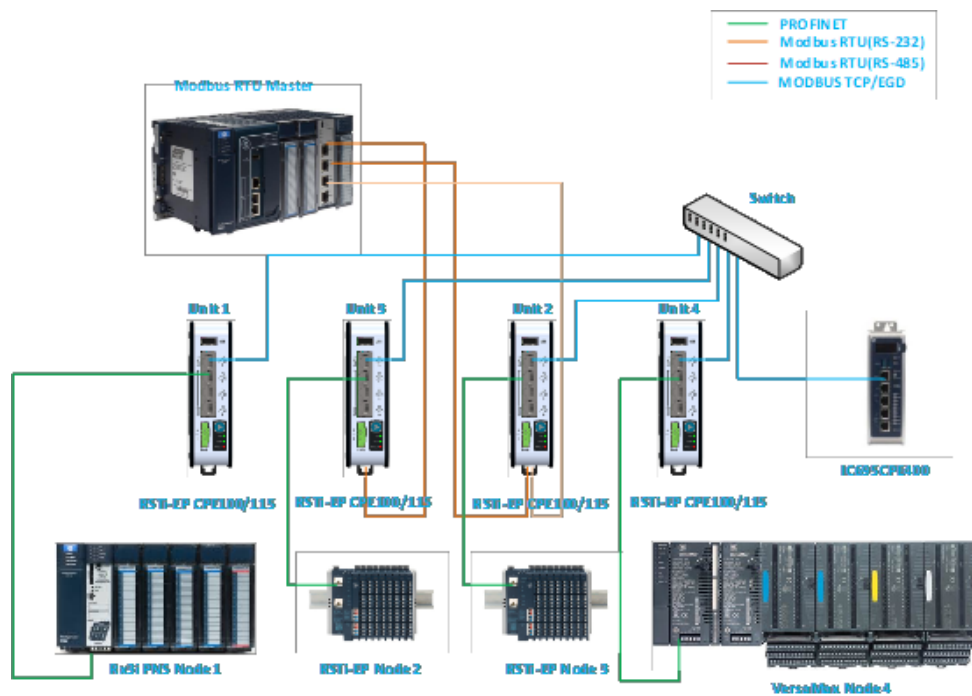
Chapter 3: Process Automation Application

This section is intended to demonstrate a typical process automation use case for the RSTi-EP Controller EPSCPE100/115. This section will provide a single configuration along with controller performance measurements.

3.1 Configuration Example 1

In this application, it contains four RSTi-EP Controllers each connected with one PROFINET node, and with EGD connections interfaced with RX3i CPE400 controller which is configured with four EGD exchanges. Also, two of the RSTi-EP controllers are connected to Modbus RTU Master via the RS-232 and RS-485 serial connections.

Figure 5: Sample Process Automation Configuration Using Four CPE100/CPE115s



The following table illustrates the EGD system configuration:

EGD System Configuration				
UNIT	DEVICE	Consumed / Produced Period (ms)	BYTES	DEST. TYPE
All RSTi-EP Controllers	Consumer 1	200 (Def)	1400	
	Consumer 2	200 (Def)	1400	
	Producer 1	20	1400	Unicast
	Producer 2	20	1400	Unicast
	Total Bytes			5600

EGD System Configuration				
UNIT	DEVICE	Consumed / Produced Period (ms)	BYTES	DEST. TYPE
CPE400	Consumer 1	200 (Def)	1400	
	Consumer 2	200 (Def)	1400	
	Consumer 3	200 (Def)	1400	
	Consumer 4	200 (Def)	1400	
	Consumer 5	200 (Def)	1400	
	Consumer 6	200 (Def)	1400	
	Consumer 7	200 (Def)	1400	
	Consumer 8	200 (Def)	1400	
	Producer 1	20	1400	Unicast
	Producer 2	20	1400	Unicast
	Producer 3	20	1400	Unicast
	Producer 4	20	1400	Unicast
	Producer 5	20	1400	Unicast
	Producer 6	20	1400	Unicast
	Producer 7	20	1400	Unicast
	Producer 8	20	1400	Unicast
		Total Bytes		22400

The four controllers' PROFINET LAN is configured with PROFINET nodes. The I/O Scan is set to Normal Sweep mode. All communication parameters are set to default values. One PROFINET node is connected to each RSTi-EP Controller unit as shown in Figure 5. PROFINET Node contain I/O modules with various combinations of discrete 4/8/16 point in/out modules and analog 4/8 channel in/out modules. The adjoining I/O module average and maximum loopback time is captured for the individual node. Each I/O module has its outputs tied to the inputs of an adjoining I/O module. For more details about individual PROFINET nodes refer to the Appendix B:

PROFINET System Configuration				
PROFINET DEVICE	Total # of PROFINET I/O Modules	Total # of PROFINET I/O Discrete points/Analog Channels	UPDATE RATE (ms)	I/O BYTES
Node 1: Rx3i PNS001	3	64/6	16	53
Node 2: EPXPNS001	18	16/99	16	317
Node 3: EPXPNS001	64	276/230	16	713
Node 4: VERSAMAX PNS	2	0/19	16	62
Total	87	356/354		1145

The RSTi-EP Controller Unit 3 is connected to a Modbus RTU Master via a RS-485 (2-wire) and via a RS-232 serial connections. Controller Unit 2 is connected to a Modbus RTU Master via RS-485 (4-wire) serial connection. The RTU Masters is set at baud rate of 115.2 Kbps for both the RS-232 and RS-485 configurations. Loopback times is measured between Holding and Input Register, and Discrete Input and Coil. The configuration parameters are shown in the below table.

Number of Configured Channels	
Modbus TCP	2
SRTP	2
Modbus RTU	2 (1 RS-232 and 1 RS485)

Modbus RTU Slave Configuration: RS-232 at 115200 Baud	
Modbus Register	Data Bytes
DISCRETE INPUT	64
COILS	64
Total Bytes	128

Modbus RTU Slave Configuration: RS-485 (2 wire/4 wire) at 115200 Baud	
Modbus Register	Data Bytes
HOLDING REG	32
INPUT REG	32
Total Bytes	64

3.1.1 Performance Measurement

Typical and Max I/O loopback times are calculated as a mean of the analog and discrete loopback times across PROFINET node.

Measurement	Unit #	Typical Time (ms)	Max Time (ms)
RSTi-EP Controller Sweep Time	1	4	10
	2	5	15
	3	6	17
	4	3	10
PROFINET Discrete I/O Loopback Time	1	34	50
	2	30	54
	3	40	57
PROFINET Analog I/O Loopback Time	3	32	51
	4	70	86
EGD Loopback Time	1	22	46
	2	23	63
	3	22	59
	4	21	53
RTU Slave Loopback Time	3(RS485)	287	10967
	3(RS232)	86	567
	2(RS485)	188	987

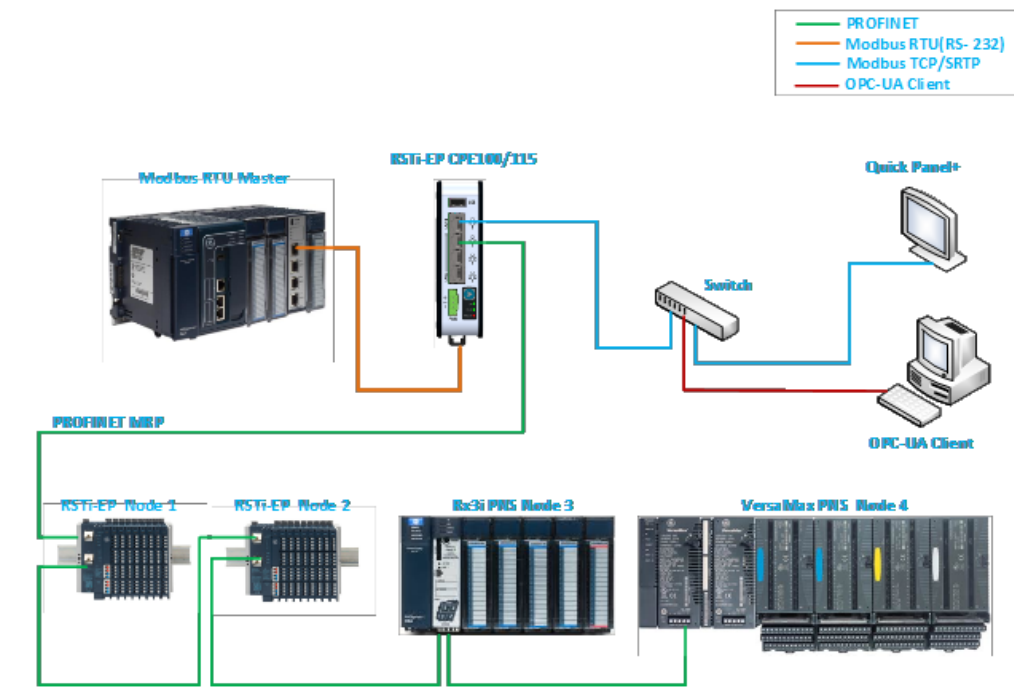
Chapter 4: Focused Solution

This section is intended to demonstrate a typical focused solution use case for the RSTi-EP Controller EPSCPE100/115. This section will provide a single configuration along with controller performance measurements.

4.1 Configuration Example 1

In this application, the RSTi-EP Controller's embedded PROFINET LAN is connected to four PROFINET nodes and a Modbus RTU Master via the RS-232 serial connections. The Controller's Ethernet LAN is interfaced with Quick Panel+ over SRTP and is communicating with OPC-UA client.

Figure 6: Sample Process Automation Configuration Using Four CPE100/CPE115s



The PROFINET LAN is configured with PROFINET nodes. The I/O Scan is set to Normal Sweep mode and all communication settings are set to default values. Four PROFINET nodes are connected to the RSTi-EP Controller unit as shown in Figure 5. Each node contains I/O modules with various combinations of discrete 4/8/16 point I/O modules and analog 4/8 channel I/O modules. Each I/O module had its outputs tied to the inputs of an adjoining I/O module. For details about individual PROFINET nodes refer to Appendix A:

PROFINET System Configuration				
PROFINET DEVICE	Total # of PROFINET I/O Modules	Total # of PROFINET I/O Discrete points/Analog Channels	UPDATE RATE (ms)	I/O BYTES
Node 1: EPXPNS001	64	276/230	16	713
Node 2: EPXPNS001	18	16/99	16	317
Node 3: Rx3i PNS001	3	64/6	16	53
Node 4: VERSAMAX PNS	2	0/19	16	62
Total	87	356/354		1145

The RSTi-EP Controller unit is connected to a Modbus RTU Master via a RS-232 serial connection. The RTU Master's timeout is set to 10 seconds with a baud rate of 115.2 Kbps. Loopback is measured between Holding and Input Register, Discrete Input and Coil. The configuration parameters are as shown in the below table:

Modbus RTU Slave Configuration: RS-232 at 115200 Baud	
Modbus Register	Data Bytes
HOLDING REG	16
INPUT REG	16
DISCRETE INPUT	32
COILS	32
Total Bytes	96

Number of Configured Channels	
Modbus TCP	2
SRTP	1
Modbus RTU	1 (RS-232)
OCA-UA	1

The controller is also configured with an OPC UA Server with one session and one subscription. There are 493 published elements, the publishing interval is set to 500 ms.

4.1.1 Performance Measurement

Typical and Max loopback times are calculated as a mean of the analog and discrete loopback times across all eight nodes. The following table records the Typical and Max loopback times for the configuration featured in Configuration Example 1 of this section.

Measurements	Typical Time (ms)	Max Time (ms)
RSTi-EP Controller Sweep Time	9	17
PROFINET Discrete I/O Loopback Time	61	88
PROFINET Analog I/O Loopback Time	74	100
RTU Slave Loopback Time	98	218

Appendix A: PROFINET Node Details

This section provides details on the individual PROFINET nodes with descriptions for each slot.

Node 1: EPXPNS001 (64 I/O module)

Location	Description	Data Bytes
0	EPXPNS001 (PROFINET SCANNER)	8
1	EP-1214 (DI4)	3
2	EP-1218 (DI8 2-wire)	3
3	EP-125F (DI16)	4
4	EP-1318 (DI8 3-wire)	3
5	EP-12F4 (DI4 TS)	62
6	EP-2814 (DO4 SSR)	3
7	EP-2214 (DO4 0.5A)	3
8	EP-2218 (DO8)	3
9	EP-225F (DO16)	4
10	EP-2634 (DO4 P/N)	3
11	EP-2214 (DO4 0.5A)	3
12	EP-2218 (DO8)	3
13	EP-4164 (AO4 V/I)	10
14	EP-3164 (AI4 V/I)	10
15	EP-4264 (AO4 V/I DIAG)	10
16	EP-4164 (AO4 V/I)	10
17	EP-3124 (AI4 V/I 12BITS)	10
18	EP-3264 (AI4 V/I DIAG)	10
19	EP-3368 (AI8 I)	18
20	EP-4164 (AO4 V/I)	10
21	EP-4164 (AO4 V/I)	10
22	EP-5111 (HSC1)	26
23	EP-5422 (PWM 0.5A)	20
24	EP-3704 (AI4 RTD)	10
25	EP-3704 (AI4 RTD)	10
26	EP-3704 (AI4 RTD)	10
27	EP-3804 (AI4 TC)	10
28	EP-3804 (AI4 TC)	10
29	EP-3804 (AI4 TC)	10
30	EP-3804 (AI4 TC)	10
31	EP-4264 (AO4 V/I DIAG)	10
32	EP-4164 (AO4 V/I)	10

33	EP-4164 (AO4 V/I)	10
34	EP-4164 (AO4 V/I)	10
35	EP-4164 (AO4 V/I)	10
36	EP-4164 (AO4 V/I)	10
37	EP-4164 (AO4 V/I)	10
38	EP-5112 (HSC2)	28
39	EP-5442 (PWM 2A)	20
40	EP-2714 (DO4 RLY)	3
41	EP-3124 (AI4 V/I 12BITS)	10
42	EP-4164 (AO4 V/I)	10
43	EP-1218 (DI8 2-wire)	3
44	EP-3468 (AI8 I DIAG)	18
45	EP-5212 (FREQ1)	36
46	EP-5111 (HSC1)	26
47	EP-5112 (HSC2)	28
48	EP-5422 (PWM 0.5A)	20
49	EP-225F (DO16)	4
50	EP-2218 (DO8)	3
51	EP-1218 (DI8 2-wire)	3
52	EP-5422 (PWM 0.5A)	20
53	EP-5442 (PWM 2A)	20
54	EP-1901 (DI1 SF)	6
55	EP-3124 (AI4 V/I 12BITS)	10
56	EP-4264 (AO4 V/I DIAG)	10
57	EP-4264 (AO4 V/I DIAG)	10
58	EP-1922 (DI2 SF ProgDelay)	6
59	EP-3164 (AI4 V/I)	10
60	EP-225F (DO16)	4
61	EP-125F (DI16)	4
62	EP-1902 (DI2 SF)	6
63	EP-2218 (DO8)	3
64	EP-1218 (DI8 2-wire)	3

Node 2: EPXPNS001 (18 I/O Modules)

Location	Description	Data Bytes
0	EPXPNS001 (PROFINET SCANNER)	8
1	EP-2214 (DO4 0.5A)	3
2	EP-1214 (DI4)	3
3	EP-5112 (HSC2)	28
4	EP-5442 (PWM 2A)	20
5	EP-4164 (AO4 V/I)	10
6	EP-3164 (AI4 V/I)	10
7	EP-4264 (AO4 V/I DIAG)	10
8	EP-3124 (AI4 V/I 12BITS)	10
9	EP-3704 (AI4 RTD)	10
10	EP-4164 (AO4 V/I)	10
11	EP-3804 (AI4 TC)	10
12	EP-5111 (HSC1)	26
13	EP-5422 (PWM 0.5A)	20
14	EP-12F4 (DI4 TS)	62
15	EP-2214 (DO4 0.5A)	3
16	EP-3468 (AI8 I DIAG)	18
17	EP-5212 (FREQ1)	36
18	EP-5442 (PWM 2A)	20

Node 3: EPXPNS001 (4 I/O Modules)

Location	Description	Data Bytes
0	EPXPNS001 (PROFINET SCANNER)	8
1	EP-125F (DI16)	4
2	EP-225F (DO16)	4
3	EP-4164 (AO4 V/I)	10
4	EP-3164 (AI4 V/I)	10

Node 4: VersaMax PNS1 (1 I/O Modules)

Location	Description	Data Bytes
0	VersaMax PROFINET I/O Scanner (2 RJ-45 Copper connectors)	20
1	IC200MDD840: Mixed 24VDC In Grp 20Pt / Out Relay 2.0A Grp 12Pt	9

Node 5: VersaMax PNS2 (2 I/O Modules)

Location	Description	Data Bytes
0	VersaMax PROFINET I/O Scanner (2 RJ-45 Copper connectors)	20
1	IC200ALG331: Analog Output 16 Bit Volt/Curr 1500VAC Iso 4Ch	10
2	IC200ALG263: Analog Input 15 Bit Voltage 15Ch	32

Node 6: RX3i CEP001 (2 I/O Modules)

Location	Description	Data Bytes
0	RX3i Carrier Embedded PROFINET (Copper)	18
1.1	IC694MDI754:32 Circuit Output 12/24 VDC 0.75A Positive ESCP	10
2.1	IC694MDL660: 32 Circuit Input 24 VDC Positive / Negative Logic	8

Node 7: RX3i PNS001 (3 I/O Modules)

Location	Description	Data Bytes
0	IC695PNS001 (PROFINET SCANNER)	18
1	IC694ALG442: 4 Input / /2 Output Channel Mixed Analog Current Voltage	17
2	IC694MDL754:32 Circuit Output 12/24 VDC 0.75A Positive ESCP	10
3	IC694MDL660: 32 Circuit Input 24 VDC Positive / Negative Logic	8

Node 8: EPXPNS001 (3 I/O Modules)

Location	Description	Data Bytes
0	EPXPNS001 (PROFINET SCANNER)	8
1	EP-125F (DI16)	4
2	EP-225F (DO16)	4
3	EP-125F (DI16)	4

Appendix B: VersaMax Ethernet Node Details

The following tables provide details on the VersaMax Ethernet Nodes for Section 2.4, Configuration Example 4.

Node 1: IC200EBI001

Produce period = 20 ms, Consume Period = 200 ms

Location	Catalog Number	Data Bytes
Slot1	IC200MDL650	4
Slot2	IC200MDL750	4
Slot3	IC200ALG230	8
Slot4	IC200ALG321	8
Slot5	IC200MDD845	3
Slot6	IC200ALG431	12
Slot7	IC200MDD841	75

Node 2: IC200EBI001

Produce period = 20 ms, Consume Period = 200 ms

Location	Catalog Number	Data Bytes
Slot1	IC200MDM842	4
Rack 1, Slot1	IC200MDL752	4
Rack 1, Slot2	IC200MDL636	4
Rack 1, Slot3	IC200ALG331	8
Rack 1, Slot4	IC200ALG240	16

Node 3: IC200EBI001

Produce period = 20 ms, Consume Period = 200 ms

Location	Catalog Number	Data Bytes
Slot1	IC200MDL143	1
Slot2	IC200MDL144	1
Slot3	IC200MDL241	2
Slot4	IC200MDL631	1
Slot5	IC200MDL632	2
Slot6	IC200MDL635	2
Slot7	IC200MDI636	4
Slot8	IC200MDL643	2

Node 4: IC200EBI001

Produce period = 20 ms, Consume Period = 200 ms

Location	Catalog Number	Data Bytes
Slot1	IC200MDL329	1
Slot2	IC200MDL930	1
Slot3	IC200MDL940	2
Slot4	IC200MDL930	1
Slot5	IC200MDL940	2
Slot6	IC200MDL940	2
Slot7	IC200MDL940	2
Slot8	IC200MDL940	2

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Any escalation request should be sent to: mas.sfdcescalation@emerson.com

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