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How to... Connect a SGM720 or SGM820 to a Omron PLC with Ethernet IP



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General information

When the SGM720 or SGM820 is powered by USB (not 24Vdc) the load cell interface, analog output and the Ethernet port will not work.



SGM720 Ethernet connection



Setup the SGM720 or SGM820

Connect the SGM720 or SGM820 to a PC using a USB-cable and open Pi Mach II and double click on **SGM720** or **SGM820**, then double click on **System Setup**, then double click on **Communication**, then double click on **Ethernet**, set the **Ethernet address**. Click on **Apply** to save settings.

π² SGM 700 serie, Device Version: 01.03, Build: 06, Serial: 13180057, Module Version: 00.00, Build: 00, Project: C:\Program Files\PI Mach II 72\ - - X File Project Environment View Tools Help 💕 On-Line 🛛 🛞 Firmware Update Manager 🚡 Program Builder 🧠 Flex Builder 💷 Watches 🛛 🧔 Exit 💻 Display 🕨 Control 🌒 Tasks 📲 I/D 🚎 Indicator & Registers 📼 Labels 📰 Results 🗰 Printer Layout 📠 Printer Ticket 🛛 🙆 Clock 🗠 Scope 👔 Manage ⊡- Penko Class: Penko.Device root.SGM720 Ethernet.System Setup.Communication.Ethernet Device root Path: 1.1.1.3.3.2 SGM720 Ethernet 1.1.1.1 Name = - 1.1.1.2 Start Quick setup 00:03:64:02:DD:86 MAC 1.1.1.3 Enable Full setup + Live Penko Name • System System Setup Address 192 . 168 . 151 . 63 Service H-Indicator 255 . 255 . 255 . 0 Mask Communication Gateway 0.0.0.0 Ethernet BusLink DHCP DISABLE • Digital inputs Digital outputs
 Factory recall Control Import Properties (CSV) Discover ACTIVE Ethernet Address: 192.168.151.63 UDP open

Note: the first 3 numbers of the IP address must be the same as the PLC.

Wiring

Connect the SGM720 or SGM820 directly to the Omron PLC with a Ethernet cross cable. Or connect the SGM720 or SGM 820 with a switch to the Omron PLC.

EDS file

The EDS File can be downloaded from our website <u>www.penko.com</u>. The zip folder contains the EDS file and a PDF file explaining the EDS file.



CX-Programmer part 1

Open a new project

Open CX-Programmer to set up the PLC. In the example we use an **Omron CJ2M-CPU31 PLC**.

Click on New and set the Device Type and Network Type and click on OK.

Change PLC
Device Name
NewPLC1
Device Type
CJ2M
Network Type
USB Settings
Show all
Comment
A
-
OK Cancel Help

Double click on IO Table and Unit Setup.





Open the **Build-in Port/Inner Board** and right click on the **CJ2M-EIP21(Built In EtherNet/IP Port for CJ2M) (Unit:0)**. Go to **Start Special Application** and click on **Start with Settings Inherited**.

PLC IO Table - NewPLC1		
File Edit View Options Help		
🚇 đ 🛏 1 te te 🖬 🖉 B. B 🏍 S 🗸 🚟		
CJ2M-CPU31		
🖻 🗤 Built-in Port/Inner Board		
1 [1500] CJ2M-EIP21(Built In EtherNet/IP Port for CJ2M) (Unit : 0)		
Inner Board unmounted	Change Unit No	
	Unit Comment	
	Unit Setup	
	Sava Daramatara	
	Save Parameters	
	Load Parameters	
	Start Special Application	Start with Settings Inherited
	Unit Manufacturing information	Start Only
	Unit Error Log	
CJ2M-CPU31 Offlin	ie //	

Select Network Configurator and click on OK.

Select Special Application [CJ2M-EIP21]	x
CX-Integrator Network Configurator	
Description Network Configurator Application software to build and set up the EtherNet/IP network.	
OK Cancel	



Network Configurator

Add the PLC to the Ethernet IP network

Network Configurator will start. Select the correct Ethernet IP Module and double click on it. The module is now added to the Ethernet IP network.





Change Node Address of PLC

Right click on the PLC icon and click on **Change Node Address...**.



Give the PLC an IP address and click on **OK**.

Note: the first 3 numbers of the IP address must be the same as the SGM720 or SGM820.





Install EDS file

Click on the button Install EDS to install the SGM720 or SGM820 EDS file.



Go to the folder where the EDS file is downloaded, select the file and click on **Open**.

🖳 Install EDS	File		x
Look in: 🌗	EIP 👻	G 🌶 📂 🛄 -	
Name	*	Date modified	Ту
📗 OLD		2-4-2014 13:59	Fi
SGM720	V1.3.1.eds	14-2-2013 15:42	EĽ
•	III		Þ
File name:	SGM720 V1.3.1.eds	Open	
Files of type:	Electronic Data Sheet(*.eds)	▼ Cancel	Ĵ
Device Infor Vend Device Typ Product Nam Revisio	mation or : Penko Engineering B.V. ne : Communications Adapter ne : SGM720 on : 1.03		



Add the SGM720 or SGM820 to the Ethernet IP network

The SGM720 or SGM820 is now added to the list. Double click on **SGM720** and the SGM720 or SGM820 is added to the Ethernet IP Network.





Change Node Address of the SGM720 or SGM820

Right click on the SGM720 or SGM820 and click on Change Node Address....

EtherNet/IP_1	
192.168.151.4 192.168 CJ2M-EIP21 SGM7	250 Parameter
	髥 <u>M</u> onitor
	Reset
	Maintenance Information
	Register to other Device
	External Data
	∦ Cu <u>t</u>
	喧 <u>)</u> <u>C</u> opy
	× <u>D</u> elete
	Change Node <u>A</u> ddress
	Change Device Comment
	縉 Edit I/O <u>C</u> omment
	Synchronize Identity
	Property

Give the SGM720 or SGM820 an IP address (the same IP address as configured in Pi Mach II) and click on **OK**.

Note: the IP address must be identical as the IP address of the SGM720 or SGM820.





Set up the Ethernet IP network

Double click on the PLC icon.



Select the SGM720 or SGM820 in the "Unregister Device List" and click on the arrow button.

t Device Parameters	: 192.168.151.4 CJ2M-EIP21	
Connections Tag Sets	8	
Unregister Device List	t	
#	Product Name	
192.168.151.63	SGM720	
Connections : 0/32 (
- Register Device List -		
Product Name	192.168.151.4 CJ2M-EIP21 Variable Target Variable	
New Edit	Delete Edit All Change Target Node ID	To/From File
New Edit	Delete Edit All Change Target Node ID	To/From File
New Edit	Delete Edit All Change Target Node ID	To/From File



The SGM720 or SGM820 is now added to the "Register Device List. Double click on the SGM720 or SGM820.

it Device Parameters	: 192.168.151.4 CJ2M-EIP21
Connections Tag Sets	S
Unregister Device Lis	4
#	Product Name
Connections: 0/32	(O:0,T:0)
Register Device List	
Product Name	192.168.151.4 CJ2M-EIP21 Variable Target Variable
192.168.151.63	(#063) SGM720
	6
•	۲
New Edi	t Delete Edit All Change Target Node ID To/From File

Select Connection I/O Type

Select a "Connection I/O Type" in the example the connection "Weigher" is used.

192.168.151.63 SGM7	20 Edit Connection			x
It will add a connection Please configure the Ta	configuration to originator device. ag Set each of originator device and tai	rget device.	e.	
Connection I/O Type	Weigher	•	•	
Originator Device	Weigher Device		arget Device	
Node Address : 19	12.11 Control	~~~~	Node Address : 192.168.151.63	
Comment: CJ	2M-EIP21		Comment : SGM720	
Input Tag Set : E	dit Tag Sets		Output Tag Set :	
Connection Mu Type :		٠	[Input_785 - [36Byte]	•
Output Tag Set : E	dit Tag Sets	ш	Input Tag Set :	
Connection	·	•		-
Type:	int to Point connection			
Show Detail			Regist Close	



Set up the Input Tag Set

To set up the Input Tag Set, click on the button Edit Tag Sets.

Note: The length of the SGM720 or SGM820 output tag set is 36 Bytes. The length of the bytes is needed to set up the Input Tag Set.

192.168.151.63 SGM720 Edit Connection X It will add a connection configuration to originator device. Please configure the Tag Set each of originator device and target device. Connection I/O Type : Weigher Originator Device Target Device Node Address : 192.168.151.4 Node Address : 192.168.151.63 Comment : CJ2M-EIP21 Comment : SGM720 Output Tag Set : Input Tag Set : Edit Tag Sets Input_785 - [36Byte] • • Connection Multi-cast connection • Output Tag Set : Edit Tag Sets Input Tag Set : Ŧ Connection Point to Point connection -Type : Show Detail Regist Close

Click on Edit Tags... to configure a new Tag.

Name	Over	Size Bit	ID
New Edit Delete		Expand All	Collapse A



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Click on **New**.

In - Consume				
Name		Over	Size	Bit
New	Edit De	elete		

Give the Tag a name and set the byte size. Click on **Regist**.

Edit Tag
Name : SGM720_Weigher
Size : 36 Byte
Use Bit Data
Bit Size : Bit
Over Load Disable Enable
OK Cancel



The Tag is added to the list, click on **OK**.

Name	Over	Size	Bit
📾 SGM720_Weigher		36Byte	

Click on Yes.

Network Configurator	
The new Tags will be registered as Tag sets.	
Yes No	



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Click on **OK**.

Name	Over	Size Bit	ID
🛱 SGM720_Weigher		36Byte	Auto
New Edit Delete		Expand All	Collapse All

The Input Tag Set can now be selected. After the Input Tag Set is done, click on Regist.

192.168.151.63 SGM72	0 Edit Connection				×
It will add a connection o Please configure the Tag	configuration to originator device. g Set each of originator device and l	target device.			
Connection I/O Type :	Weigher		•		
Originator Device) (Target Device		
Node Address : 192	.168.151.4		Node Address :	192.168.151.63	
Comment: CJ2	M-EIP21		Comment :	SGM720	
Input Tag Set : Ed	lit Tag Sets		Output Tag Set :		
SGN	1720_Weigher [36Byte]		Ī	nput_785 - [36Byte]	•
Connection Type : Mult	i-cast connection	П			
Output Tag Set : Ed	iit Tag Sets		Input Tag Set :		
	~	-			-
Connection Type :	t to Point connection	"			
Show Detail				Regist	Close



The Input tag is now visible in the "Register Device List". Click on **OK** to close the window.

Edit Device Parameters : 192.16	8.151.4 CJ2M-EIP21	X
Tag Sets		
Unregister Device List		71
#	Product Name	
Connections : 1/32 (0 : 1, T	:0)	
Register Device List Product Name	192.168.151.4 CJ2M-EIP21 Variable Target Variable	
192.168.151.63 (#063)		
	Schrizzo_weigher input_263	
New Edit	Delete Edit Al Change Target Node ID To/From File	
	OK Canc	el

Download settings to the PLC

Note: check if the PLC is in the Stop/Program mode, otherwise it's not possible to download the settings to the PLC.

Go to Network and click on Connect....

ſ	Studie - Network Configurator								
	File	Edit	View	Network Device	EDS File	Tools	Option	Help	_
		🗃		<u> 문</u> <u>C</u> onnect	N		Ctrl	₩	a 🗙 📭 95 i
	1	۳	÷	Disconnect	45		Ctrl	+Q	
] ⑧ ♥ ■ 🖬 🐐								

Select an interface card. The selected interface card must be in the same range as the PLC and the SGM720 or SGM820.

Select Interface X	
Select Interface Card.	
Realtek PCI GBE Family Controller [192.168.151.60]	
OK Cancel	

Select the network port that you would like to connect and click on **OK**.

Select Connect Netwo	Select Connect Network Port					
Select a network port that you would like to connect.						
Browse			h			
- Device Information						
Device miorination						
Vendor ID : Douise Turpe :	Product Name : Revision :					
Device Type.	HEMISION .					
Refresh		Option				
	OK Cancel					

Select Use the existing network and click on OK.

Select Connected Network					
Please select a network where the connected network was supported.					
Target Network					
Create new network.					
Use the existing network.					
EtherNet/IP_1					
OK Cancel					
OK Cancel					



Click on the button **Download to Network**.

State - Network Configurator	STATESTATES AND
File Edit View Network Device EDS F	ile Tools Option Help
] 🗅 🚅 🔒 🗏 💂 🎝 🖓 🖓 🌺	🔄 🎸 🎒 🗴 🖻 🖻 🗙 🖪 🚼 🏢 🗰 🖏
	Download to Network(Ctrl+D)
	C EtherNet/IP_1 EtherNet/IP_1 192.168.151.4 CJ2M-EIP21 CJ2M-EI

The following screen will appear. Click on Yes.



If the PLC is in Stop/Program mode, the downloading will start. If the PLC is in another mode press **Download after changed to Program mode**.

ist of Device that are executing					
The following devices are not in program mode.					
# Product Name Comment					
192.168.151.4	CJ2M-EIP21				
Download after changes	d to Program mode	load with Current mode	Cancel		





When the downloading is completed, click on **OK**.



Save the Network Configurator, go to File and click Save.

Studie - Network Configu	urator	
File Edit View Network	Device	EC
🗋 <u>N</u> ew	Ctrl+N	
🚰 <u>O</u> pen	Ctrl+0	
Save	Ctrl+S	
Save <u>A</u> s kờ		
External Data		F
R <u>e</u> port		
Print		
Setup P <u>r</u> inter		
<u>1</u> C:\Users\\Productie.nv	ſ	
2 C:\Users\\Desktop\test	t.nvf	
<u>3</u> C:\Users\\Untitled.nvf		
4 V:\Public\\Productie.n	vf	
Exit		



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Set a file name and click **Save**.

🙀 Save As	×
Save in:]] Ethemet IP 🔹	G 🤌 📂 🛄 -
Name	Date modified Ty
No items match your searc	h.
۲ III	4
File name: SGM720.nvf	Save
Save as type: Network Configurator v3 File(*.nvf)	Cancel
Option Select target network	h.

The Network Configurator is now completed and can be closed.



CX-Programmer part 2

Add symbols

Go back to CX-Programmer, make sure that the PLC is offline. The PLC can be set offline by clicking on the button **Work Online**.

📴 Untitled - CX-Programmer - [NewPLC1 [Symbols]]
🗁 File Edit View Insert PLC Program Simulation Tools Window Help
」D ☞ ■ ଊ ⊜ 及 ୬ ୭ ୭ ୭ ୦ 2 M ≔ % ¼ 0 १ % <mark>/ ▲)</mark> ℁ ୭ ୭ . ୦ . ୦ . ୦ . ୦ . ୦ . ୦ . ୦ .
[□] ▶ 뭐 뭐 집 집 집 집 집

To add the symbol, double click on **Symbols**.





Right click on the symbols and click on Insert Symbol....

<u> </u>	Name	Data Type	Address / Value Net. Variable Rack Locati
⊡ 💑 NewProject	• P_0_1s	BOOL	CF100
🗄 📲 NewPLC1[CJ2M] Offline	• P_0_2s	BOOL	CF101
	P_1min	BOOL	<u>E</u> dit
Symbols	 P_1ms 	BOOL	
IO Table and Unit Setup	* P_1s	BOOL	🔁 Insert Symbol
	• P_AER	BOOL	Import Network V <u>a</u> riable
Memory	- P_CIO	WORD	BARELO
Programs	• P_CY	BOOL	Validate Symbols
NewProgram1 (00)	 P_Cycle_Time_Error 	BOOL	Function Block Instance Addresses
Symbols	P_Cycle_Time_Value	UDINT	
Section1	- P_DM	WORD	[▶] Large Icons
	- P_EM0	WORD	te- Small Icons
	- P_EM1	WORD	B-B- List
	- P_EM2	WORD	Detaile
	- P_EM3	WORD	
	- P_EM4	WORD	∦ Cut
	- P_EM5	WORD	Ba Conv
	- P_EM6	WORD	
	- P_EM7	WORD	
	- P_EM8	WORD	D <u>e</u> lete
	- P_EM9	WORD	Reusable File
	- P_EMA	WORD	
	- P_EMB	WORD	<u>R</u> ename
	- P_EMC	WORD	
	· P_EQ	BOOL	Properties

Configure the Symbols

Give the Symbol a name (this must be the same name as used in the **Network Configurator**). Set **Data type** on **CHANNEL**. Set the start address of the SGM720 or SGM820 data. Check the box **Net. Variable** and select **Input**.

New Symbol	×		
Name:	SGM720_Weigher		
Data type:	CHANNEL		
Address or value:	D 3000		
Comment:	*		
🔽 Net. Variable:	C Publication 🖲 Input C Output		
Link the definition to the project's CX-Server file			
Advanced Settings			



Click on Advanced Settings, check the box Array Symbol and set the Array Size. Then click on OK.

Advanced Settings	x
Array Settings: Array Symbol Array Size: 18	OK Cancel

Note: The array size is set in words. Divide the number of bytes by two to get the number of words (36 bytes / 2 = 18 words. The byte size can be found in the **Network Configurator program**.

Originator Device	
Node Address :	192.168.151.4
Comment :	CJ2M-EIP21
Input Tag Set :	Edit Tag Sets
	SGM720_Weigher - [36Byte] 🔹 🔻
Connection Type :	Multi-cast connection

The symbol is now set up, so click on **OK** to complete the setup.

New Symbol	×
Name:	SGM720_Weigher
Data type:	CHANNEL 💌
Address or value:	D3000
Comment:	*
	T
Net. Variable:	C Publication Input C Output
Link the definiti	ion to the project's CX-Server file
Advanced Settin	gs] OK Cancel

The Symbols is added to the symbols list.

VISCM720 Wainhan CHANNEL[10] D2000 INDUT						
SOM/20_weigher CHANNEL[16] D5000 INPOT Work	SGM720_Weigher	CHANNEL[18]	D3000	INPUT	Work	



Transfer the symbols to the PLC

To transfer the symbols into the PLC, the PLC must be connected to the PC. Click on the button **Work Online**.



Click on Yes to connect the PLC to the PC.



Click on the button Transfer to PLC.

📟 Untitled - CX-Programmer - [NewPLC1 [Symbols]]
🗁 File Edit View Insert PLC Program Simulation Tools Window Help
」D ☞ ■ ଊ ⊜ Q ¾ ୭ ୭ ୭ ୭ ୬ ₩ ≈ % ¼ 0 १ № <mark>.</mark> ▲ ▲ ┺ ┺ ┺ ┺ ▲ ▲ ┺ ∞ ₩ ┺ ♂ .
▋ <mark>▣</mark> ◙፼፼፼፼ኇዸቑ፟፟፟፟፟፟፟፟፟፟፟፟፟፟፟፟፟፟፟፟፟፟፟፟ <mark>፟</mark>



Click on the button **Transfer All** and all the data will transfer to the PLC.

Download Options	×
PLC: NewPLC1	ОК
Include:	Cancel
Image: Section of the symbols Image: Section of the symbols Image: Symbols	Transfer All
Symbols, Comments, Program index Transfer To/From: Comment memory Transfer files of all tasks C Transfer files by the task	
Clear program memory	
Clear automatic allocation area and forced sta	atus ttings from the
transfer target. (Check when transferring CPU unit serial com changed by NT Link auto-online or CPU unit CX-Integrator.)	ims port settings parameter edit of
Note: PLC Memory areas(CIO, Timer/Counter, Da not transferred. Please transfer PLC Memory area Memory window.	ata memory, etc.) is is from the PLC

Say Yes to all the pop-ups and the downloading will start.

Download		×
Program Download to PLC NewPLC1		
	8 <mark>–</mark>	
Transferring Special Unit Setup		
Downloading		
		Cancel



View the SGM720 or SGM820 weight values

To view the SGM720 or SGM820 weight values, double click on Memory.



To view the D area, double click on **D**, set the **Start address** on **3000** and click on the button **Monitor**.





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Click on **Monitor**.

Monitor Memory Areas	×
⊻ D	Monitor
	Cancel
]

The live data is now shown.

I D										
Start Add	ress:	3000	0	n	Off		SetValue	:		
ChangeC)rder		Ford	eOn	ForceO	Jff	ForceCan	с		
	+0	+1	+2	+3	+4	+5	+6	+7	+8	+9
D03000	5000	0	5000	0	5000	0	0	0	50003	0
D03010	50003	0	50003	0	0	0	49155	8332	5894	37633
D03020	5894	37633	5894	37633	5894	37633	0	0	0	0

Open the PDF file EIP SGM720 V1.3.3.pdf (downloaded with the EDS file) and scroll down to the following section. All the weight values have a length of 2 words (Double integer) except the Format and Status (1 word length).

DINT WEIGHERRIG Display falle weight and k10 DINT GROSSx10 Fast Gross weight x10 DINT NETx10 Fast Net weight x10 DINT TARE Active Tare weight x10 WODD FORMAT Stars in Generation	WORD FORMAT Step size formatting	0x311, 785	Get	Weigher	STRUCT OF DINT WEIGHER DINT GROSS DINT NET DINT TARE DINT WEIGHERx10 DINT GROSSx10 DINT NETx10 DINT TARE WORD FORMAT	Display rate weigher data Fast Gross weight Fast Net weight Active Tare weight Display rate weigher data x10 Fast Gross weight x10 Fast Net weight x10 Active Tare weight x10 Stan size formatting
---	----------------------------------	------------	-----	---------	---	--

Address	Description
D3000 - D3001	DINT Weigher
D3002 – D3003	DINT Gross
D3004 - D3005	DINT Net
D3006 – D3007	DINT Tare
D3008 - D3009	DINT Weigher x 10
D3010 - D3011	DINT Gross X 10
D3012 – D3013	DINT Net X 10
D3014 – D3015	DINT Tare X 10
D3016	WORD Format
D3017	WORD Status



The **Format** can be viewed best in hex. Click on the **Hex** button and set the **Start address** on 3016. The high byte will show the Stepsize and the low byte will show the Decimal point.



Used the table below we can see that the value of D3016 (C002) means that the Stepsize is 1 and the Decimal point is 0000.00.

Stepsize	High byte value	Decimal point	Low byte value
1	C0	000000	00
2	C1	00000.0	01
5	C2	0000.00	02
10	C3	000.000	03
20	C4	00.000	04
50	C5	0.00000	05
100	C6		
200	C7		

The **Status** can be viewed best in binary. Click on the **Binary** button and set the **Start address** on 3017. The status bits D3017.02, D3017.03, D3017.06, D3017.07 and D3017.13 are one.





Using the Weigher-Status word table in the EIP SGM720 V1.3.3.pdf file it's possible to see that Stable, Stable Range, Zero Range, Zero Track and Industrial mode are on.

Weigher-Status word					
Bit #	Called	Definition			
0	OVERLOAD	Hardware overload/underload detected on loadcell			
1	MAXLOAD	Overload detected on loadcell			
2	STABLE	Weigher signal is stable			
3	STABLE RANGE	Weigher signal is in stable range			
4	ZERO SET	Weigher zero is corrected			
5	ZERO CENTER	Weigher in center of zero range			
6	ZERO RANGE	Weigher is in zero range, zero is possible			
7	ZERO TRACK	Weigher signal is in zero tracking range, zero tracking is possible			
8	TARE	Weigher tare is active			
9	PTARE	Weigher preset tare is active			
10	SAMPLE	Used by internal process handling			
11	BAD CAL	Calibration is bad, invalid, not available			
12	CAL ENABLED	Calibration is enabled, used by internal process handling			
13	INDUSTRIAL	If set weigher runs in industrial mode, if reset weigher runs certified operation mode			
14	NOT LEVEL	Weigher system in blocking, warming up or scale is not level			
15	RESERVED	Reserved mode always 0			





About PENKO

Our design expertise include systems for manufacturing plants, bulk weighing, check weighing, force measuring and process control. For over 35 years, PENKO Engineering B.V. has been at the forefront of development and production of high-accuracy, high-speed weighing systems and our solutions continue to help cut costs, increase ROI and drive profits for some of the largest global brands, such as Cargill, Sara Lee, Heinz, Kraft Foods and Unilever to name but a few.

Whether you are looking for a simple stand-alone weighing system or a high-speed weighing and dosing controller for a complex automated production line, PENKO has a comprehensive range of standard solutions you can rely on.

Certifications

PENKO sets high standards for its products and product performance which are tested, certified and approved by independent expert and government organizations to ensure they meet – and even – exceed metrology industry guidelines. A library of testing certificates is available for reference on:

http://penko.com/nl/publications_certificates.html

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PENKO Professional Services

PENKO is committed to ensuring every system is installed, tested, programmed, commissioned and operational to client specifications. Our engineers, at our weighing center in Ede, Netherlands, as well as our distributors around the world, strive to solve most weighing-system issues within the same day. On a monthly basis PENKO offers free training classes to anyone interested in exploring modern, high-speed weighing instruments and solutions. A schedule of training sessions is found on: www.penko.com/training

PENKO Alliances

PENKO's worldwide network: Australia, Belgium, Brazil, China, Denmark, Germany, Egypt, Finland, France, India, Italy, Netherlands, Norway, Poland, Portugal, Slovakia, Spain, Syria, Turkey, United Kingdom, South Africa, Slovakia Sweden, Switzerland and Singapore. A complete overview you will find on: www.penko.com/dealers

