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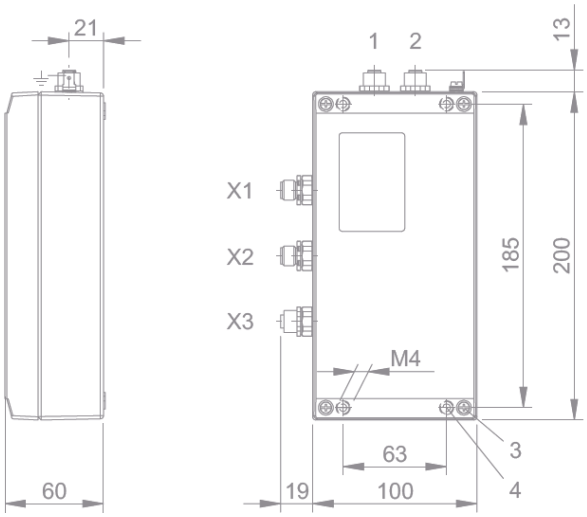
BIS M-699 CC-Link Processor

Quick Guide

BISM



English

www.balluff.com

Safety instruction

Read this section thoroughly before using the device!

Before using the controller, read this manual carefully.
During installation and operation, pay close attention to the safety aspect.

Planning the System

Design the system to work safety if the processor should be damaged or the power unit malfunction.
Do not exceed the specifications for supply voltage, conditions for use, etc. as indicated in this manual.

Handling the System

Observe the rated voltage that is indicated in the specifications.
Misuse may cause excessive heat leading to possible to fire.
Take care when connecting the system, as incorrect wiring may cause unexpected malfunction of the machine.
Ensure the power is switched off during installation or maintenance operations.
Do not dismantle or modify the devices. This could cause malfunction or overheating.

[Contents]

<NOTE>
(1) The contents and the specification are subject to change without notice.
(2) If any mistakes or errors are found in this manual, please inform us.

1 User instructions

1.1 CE Declaration of Conformity and user safety

This product was developed and produced in compliance with applicable European standards and directives.

Declaration of Conformity
This product was developed and produced in compliance with applicable European standards and directives.

Note
You can request a Declaration of Conformity separately.
For additional safety instructions, refer to the "2 Safety" section on page 7

UL-Conformity
Control No. 3TLJ
File No. E227256

1.2 Scope of delivery

Included in the scope of delivery:
- BIS C-699 CC-Link Processor
- Cover cap for Head 2 and X3 CC-Link out
- BIS software CD
- Operating instructions in printed form (GER/ENG)

1.3 About this manual

This manual describes processors in the series BIS M-699 identification system as well as start-up instructions for immediate operation.
The present manual does not describe:
- Start-up, operation, and care of the "PC and PLC'',
- Installation and operation of accessories and expansion devices,

1.4 Structure of the manual

The manual is organized so that the sections build on each other.

Section 2: Basic safety information
Section 3: Key steps for installing the Identification System
Section 4: Introduction to the material
Section 5: Technical data for the processor

Note
You find a detailed operating instruction to the M-699 on the supplied BIS software CD or in the Internet under www.balluff.com.

1.5 Typographical conventions

Enumerations

Enumerations are shown as a list with en-dash.
– Entry 1,
– entry 2.

Actions

Action instructions are indicated by a preceding triangle.
The result of an action is indicated by an arrow.

► Action instruction 1.
  Action result.
► Action instruction 2.

Syntax

Numbers
– Decimal numbers are shown without additional indicators (e.g. 123),
– Hexadecimal numbers are shown with the additional indicator hex (e.g. 00_{hex}).

Parameters
Parameters are shown in italics (e.g. CRC_*16*).

Cross-references

Cross-references indicate where additional information on the topic can be found (see "5. Technical Data" section on page 19).

1.6 Symbols

Attention!
This symbol indicates a safety instruction that must be followed.

Note, tip
This symbol indicates general notes.

1.7 Abbreviations

BIS	Balluff Identification System
CRC	Cyclic Redundancy Check
EMC	Electromagnetic Compatibility
PC	Personal Computer
PLC	Programmable Logic Controller
RFID	Radio Frequency Identification

2 Safety

2.1 Abbreviations

The BIS M-699 processor is a component of the BIS M Identification System. Within the Identification System it is used to for connecting to a host computer (PLC, PC). It may be used only for this purpose in an industrial environment corresponding to Class A of the EMC Law.
This description is valid for processors in series BIS M-699

2.2 General safety notes

Installation and start up
Installation and start up are to be performed only by trained personnel. Any damage resulting from unauthorized manipulation or improper use voids the manufacturer's guarantee and warranty.
When connecting the processor to an external controller, observe proper selection and polarity of the connection as well as the power supply (see "3.2 Electrical connection" section on page 8).
The processor may be operated only using an approved power supply (see "5. Technical Data'' section on page 19)

Operation and testing
The operator is responsible for ensuring that local safety regulations are observed.
When defects and non-clearable faults in the Identification System occur, take the system out of service and secure it against unauthorized use.

2.3 Meaning of the warning notes

Attention!
The pictogram together with the expression "Attention!'' warns of a possible hazardous situation for the health of persons or of equipment damage. Disregard of these warning notes may result in injury or damage to equipment.
► Always observe the described measures for preventing this danger.

3 Getting Start

3.1 Mechanical connection

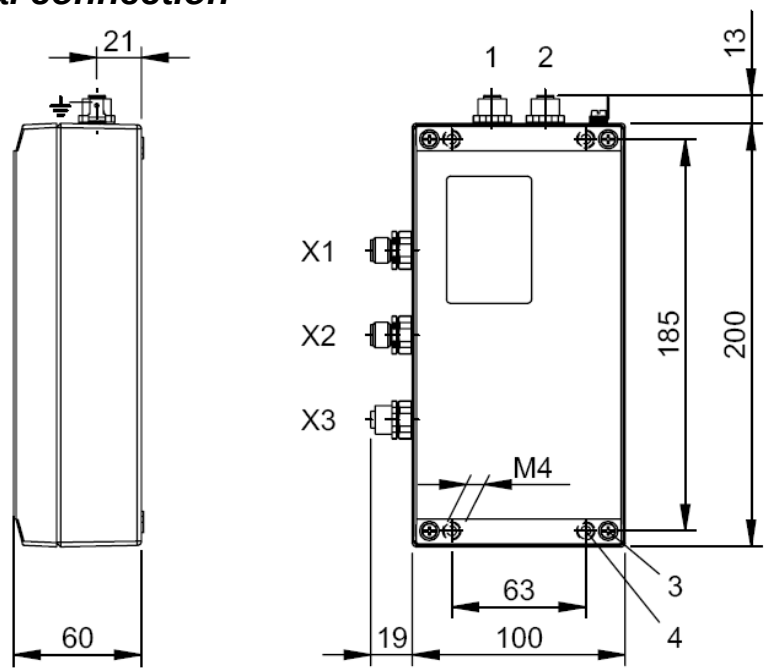
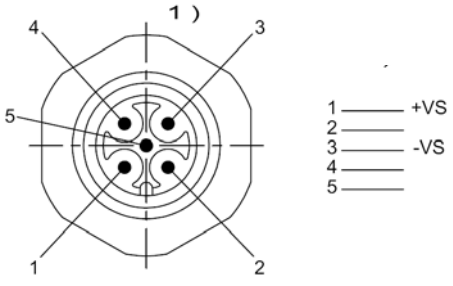


Fig. 1: Mechanical connection (dimensions in mm)

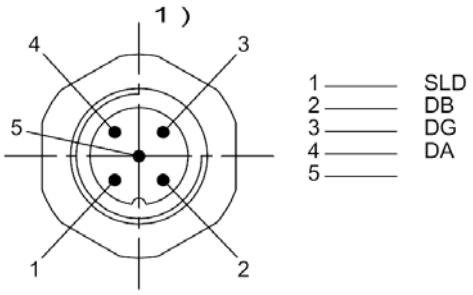
1 Connector head 2
2 Connector head 1
3 Tightening torque 0,8…1,2 Nm,
4 Tightening torque 7,8... 11,8 Nm,
► Attach processor using 4 M4 screws.

3.2 Electrical connection

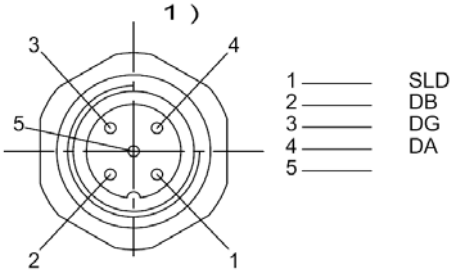
X1 Power - male 5 pol.



X2 CC-Link In - **male 5 pol.**



X3 CC-Link Out - f**emale 5 pol.**



1) View towards connector

Attention!
Make the ground connection either directly or using an RC combination to ground.
When making your connection to the CC-Link, be sure that the shield is perfectly connected to the connector body.

3.2 Project administration

Project administration with Mitsubishi PLC Q CPU

Exemplarily used modules:

Balluff Identifications system: BIS M-699-052-050-03-ST11

Programming software: GX IEC Developer from Mitsubishi

Mitsubishi controller (PLC):

Base Unit	Q38B-E		
Power supply	Q61P		
CPU	Q03UDCPU	connected via USB interface to PC	
CC-Link System Master	QJ61BT11N	slot 0	mandatory
Input Module	QX80-TS	slot 1	optional
Output Module	QY80-TS	slot 2	optional

For this example used hardware settings and wiring:
According to “8. Indications and Settings” and
”6.3 Interface information/ Wiring diagrams” of the Technical Description.

CC-Link System Master Module:

Station number 0	look at user manual Mitsubishi System Master System
Baud rate	10 Mbps

BIS M 699

Station number 1	Switch 1 ON (STATION No)
Baud rate 10 Mbps	Switch 4 ON (B RATE)
Mode 2 heads activ	RYn2 OFF

Step by step

Step 1:

Power On

Status LED of BIS M 699:
PW --> ON
RUN --> ON
L-RUN --> ON
SD --> ON
RD --> ON

Step 2:

Open customer project.

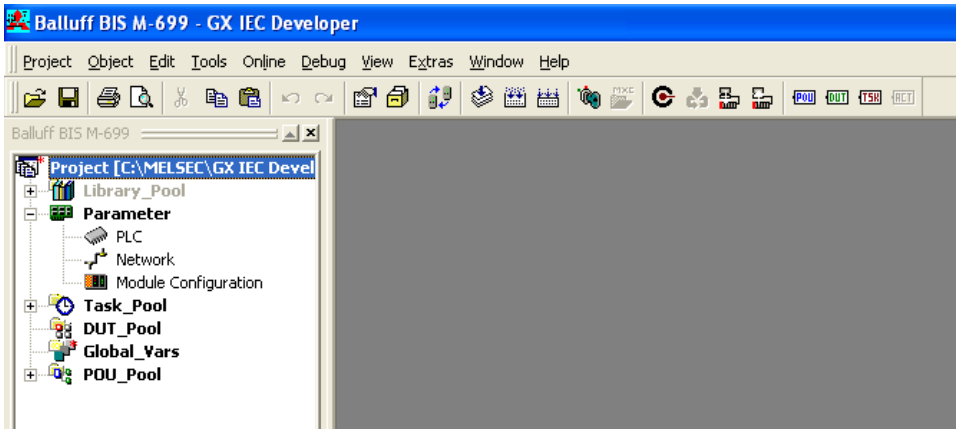


Figure 1: Project

Step 3:

Read PLC data

Set the PLC structure at the folder I/O assignment.

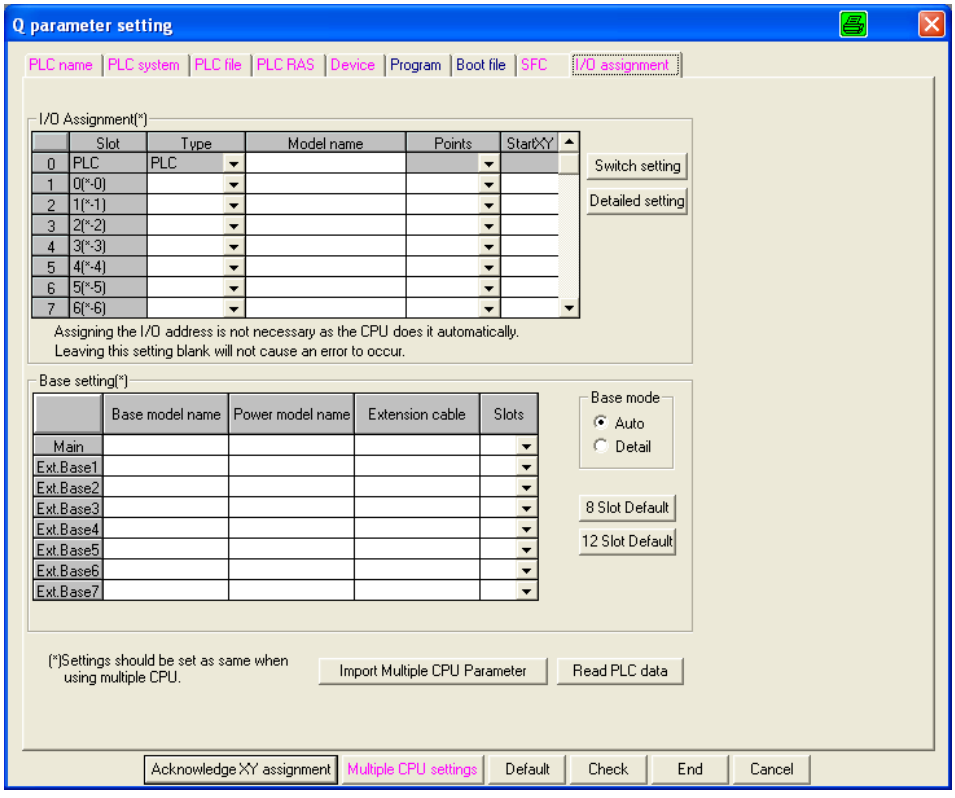


Figure 2: PLC parameter

Press the button "Read PLC data" to read out the assignment.

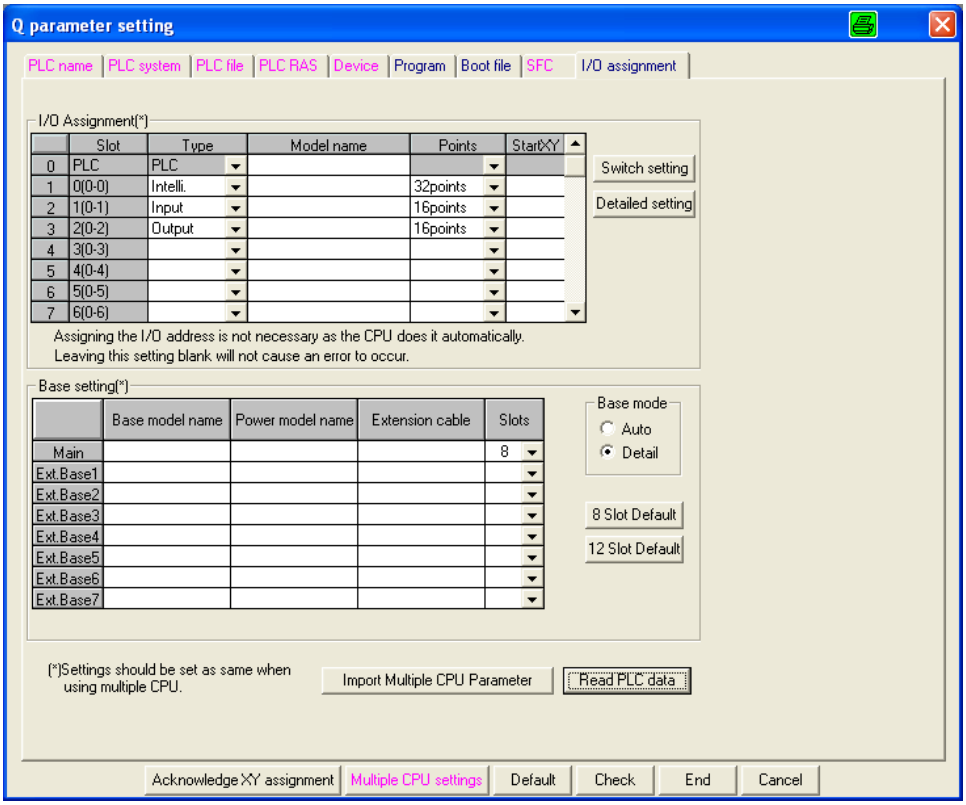


Figure 3: I/O assignment

Press the button "Check" and "End" to store the settings.
To verify the settings press „Acknowledge XY assignment“.

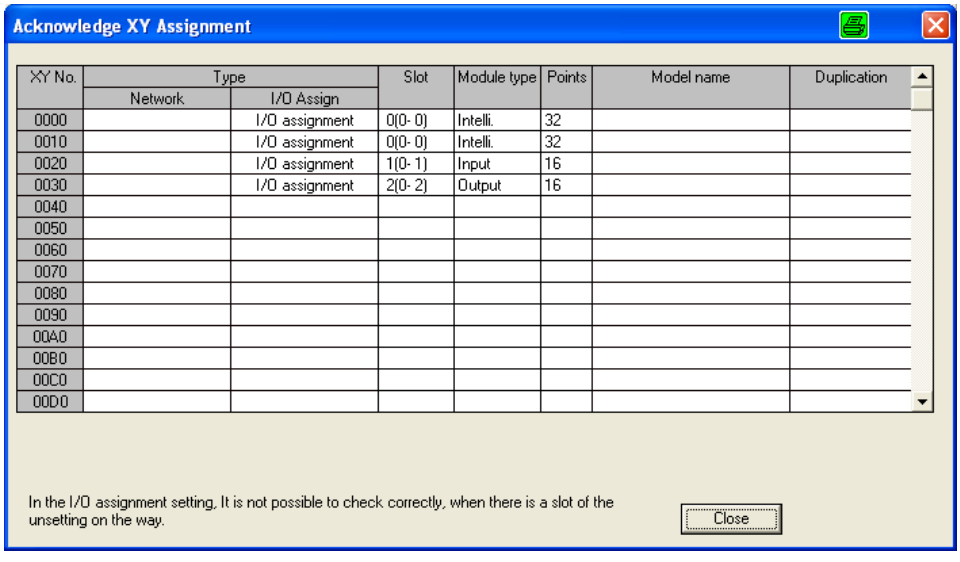


Figure 4: I/O assignment

Step 4:

CC-Link Network

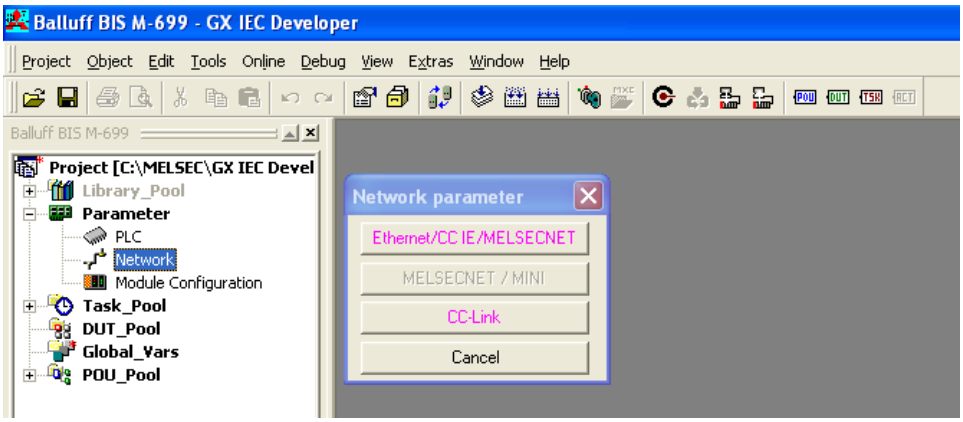


Figure 5: Network parameter

Press the button "CC-Link" to open network parameter setting.

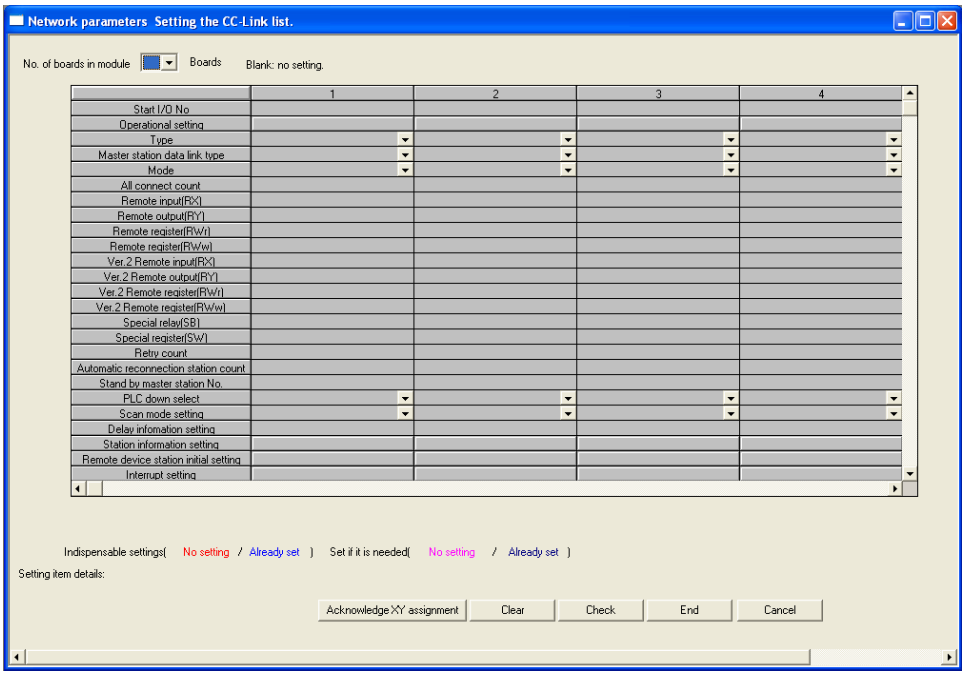


Figure 6: Network setting

In the table is to see the network settings for the example:

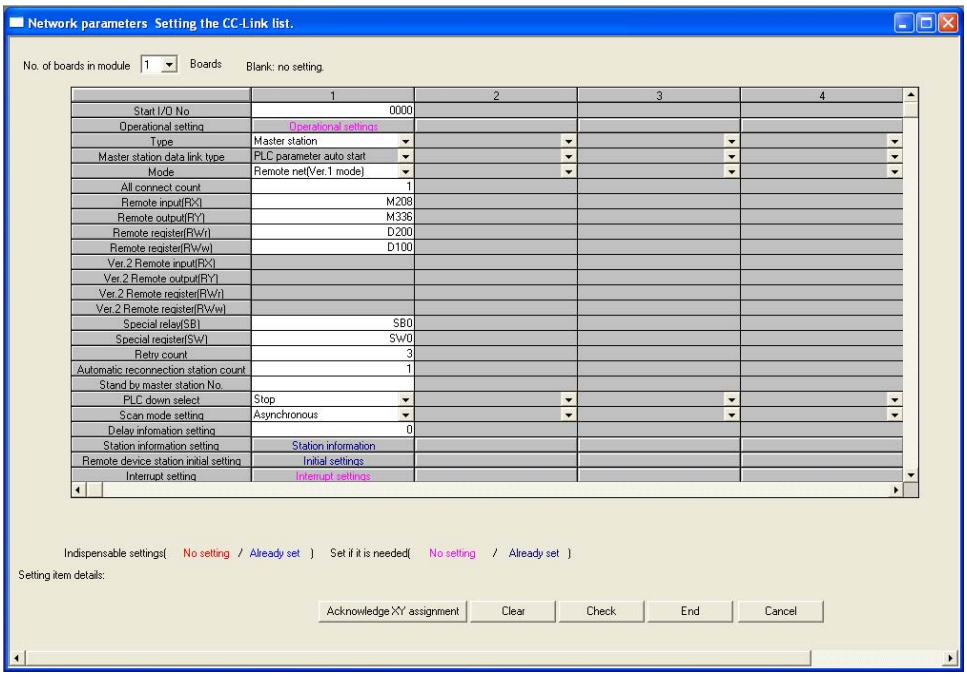


Figure 7: CC-Link settings

For more details see “10.6 Initial setting“ of the Technical Description.

No. of boards in module	1 board
Start I/O No.	0000
Type	Master-Station
Mode	Remote Net (Ver. 1 Mode)
All connect count	1
Remote input RX	M208
Remote output RY	M336
Remote Register (RWr)	D200
Remote Register (RWw)	D100
Special relay (SB)	SB0
Special Register (SW)	SW0
Retry count	3
Automatic reconnection station count	1
Delay information setting	0

Station information setting:

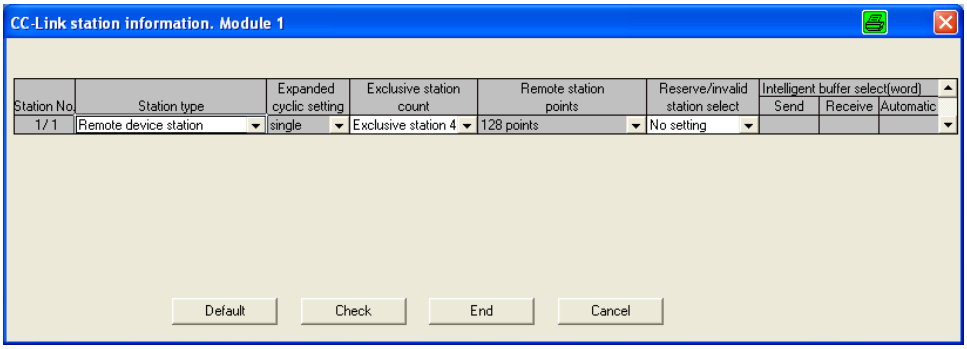


Figure 8: Station information setting

Station type	Remote device station
Exclusive station count	Exclusive station 4

Remote device station initial setting:

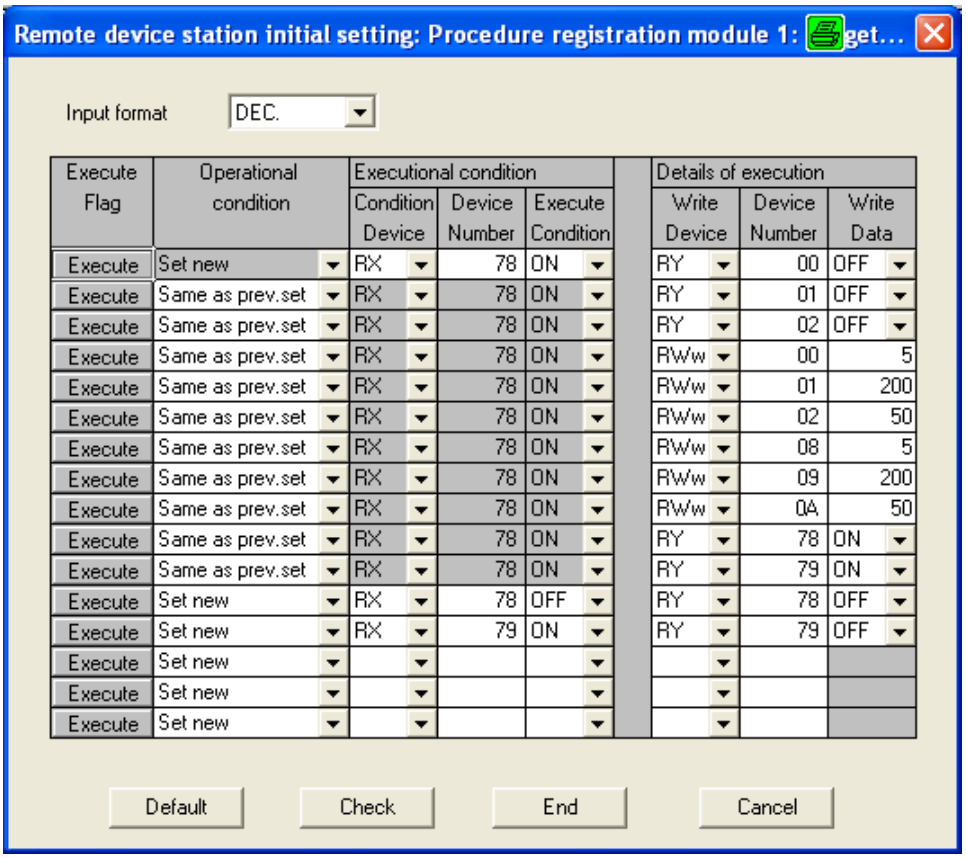


Figure 9: Initial setting

These settings will be executed during the PLC boot up to initialise the BIS M-699.
For more details see “10.6 Initial setting“ of the Technical Description

Step 5:

Initialise ladder

This ladder is needed to start the communication with BIS M-699 and to activate the R/W head.

For more details see “ 7.2.2 Input-Output Signal details", ”7.3.1 Remote Resistor list”, “7.3.2 Remote Resistor details” and “10.6 Initial setting” of the Technical Description.

Example generated in POU "MAIN_PRG_LD".

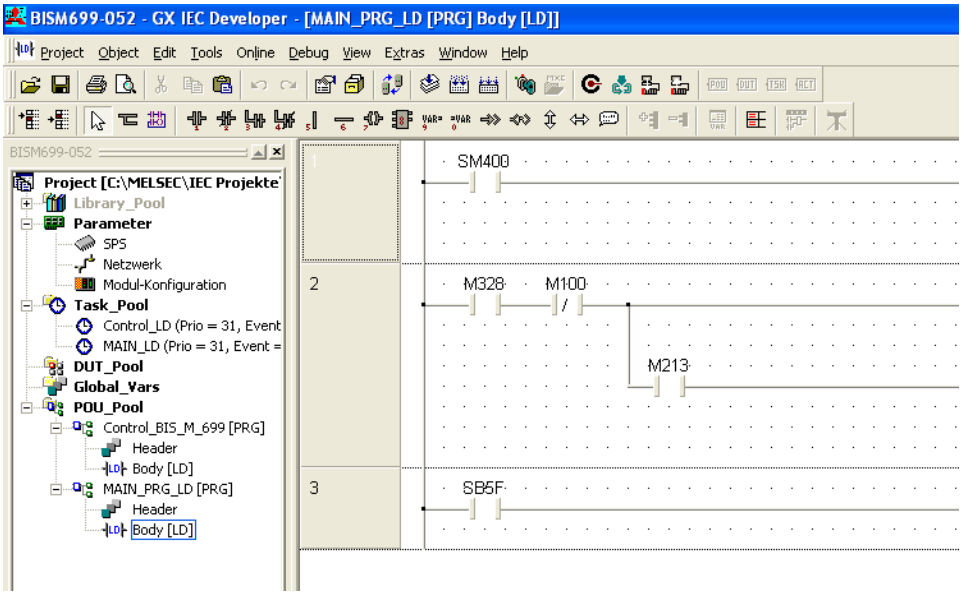


Figure 10: POU_Pool

Ladder structure:

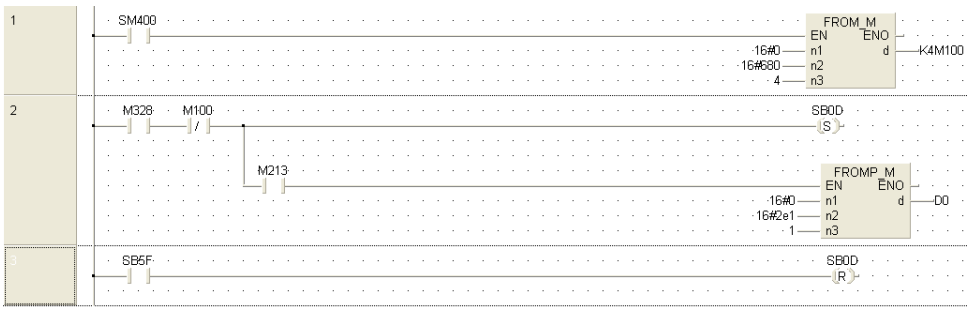


Figure 11: Init ladder

Step 6:

Save project

Compile project (Menu --> Project -->"rebuilt all")

Transfer project to CPU

CPU RESET

CPU RUN

LED state information of CPU:

MODE	green/ON
RUN	green/ON

LED state of CC-Link System Master Module

RUN	green/ON
L_RUN	green/ON
MST	green/ON
SD	green/ON

LED state of BIS M-699

RUN	red/ON
L_RUN	red/ON
MST	red/ON
SD	red/ON
RD	red/ON

Head1:

IN-Z	red/ON	if data carrier in field.

Head2:

IN-Z	red/ON	if data carrier in field.

Read-/Write function

see manual

4 Basic Knowledge

4.1 Function principle of Identification Systems

The BIS M Identification System is classified as a non-contacting system with read and write function. This makes it possible to not only transport information which is fixed programmed in the data carrier, but also to collect and pass on current information.

The main components of the BIS M Identification System are:
- Processor,
- Read/write heads,
- Data carriers.

The main areas of application are:
- In production for controlling material flow (e.g. in model-specific processes), in work piece transport with conveying systems, for acquiring safety-relevant data,
- In warehousing for monitoring material movement,
- Transporting and conveying.

4.2 Product description

Processor BIS M-699:
is connected to CC-Link as a remote device station and communicates with sequencer CPU of master/ local station.
- Metal housing,
- Supply voltage X1 and CC-Link connections X2 / X3 with M12 connectors,
- Two read/write heads can be connected,
- Read/write heads are suitable for dynamic and static operation,
- Power for the system components provided by the processor,
- Power for the data carrier provided by the read/write heads via carrier signal.

Arrangement of the read/write heads:
Which arrangement of the read/write heads makes the most sense depends essentially on the possible spatial arrangement of the components. There are no functional restrictions. Distance and relative speed depend on the characteristics of the data carriers used.

Note
If two read/write heads are connected to the BIS M-699 processor, both can be operated independently of each other:
One data carrier can be read at the first read/write head, while a different data carrier can be written to at the second read/write head.

4.3 Control function

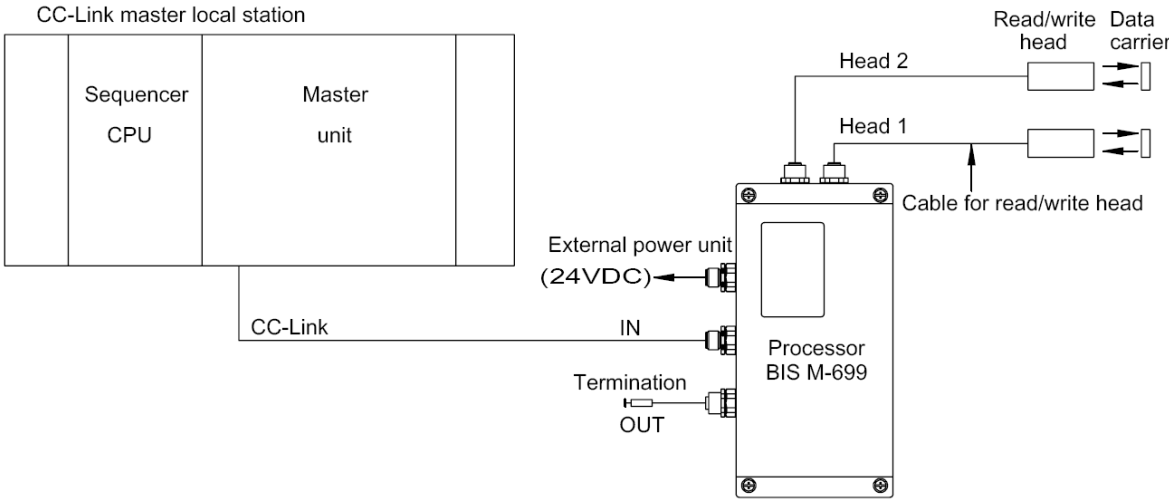
The processor is the link between data carrier and controlling system. It manages two-way data transfer between data carrier and read/write head and provides buffer storage.
The processor uses the read/write head to write data from the controlling system to the data carrier or reads the data from the carrier and makes it available to the controlling system.

Host systems may be the following:
- A control computer (e.g. industrial PC),
- A PLC.

4.4 Bus connection

Processor and controlling system are connected via CC-Link.
The CC-Link (decentralized peripheral) is tailored to communication between a controller and decentralized field devices.

4.5 System configuration

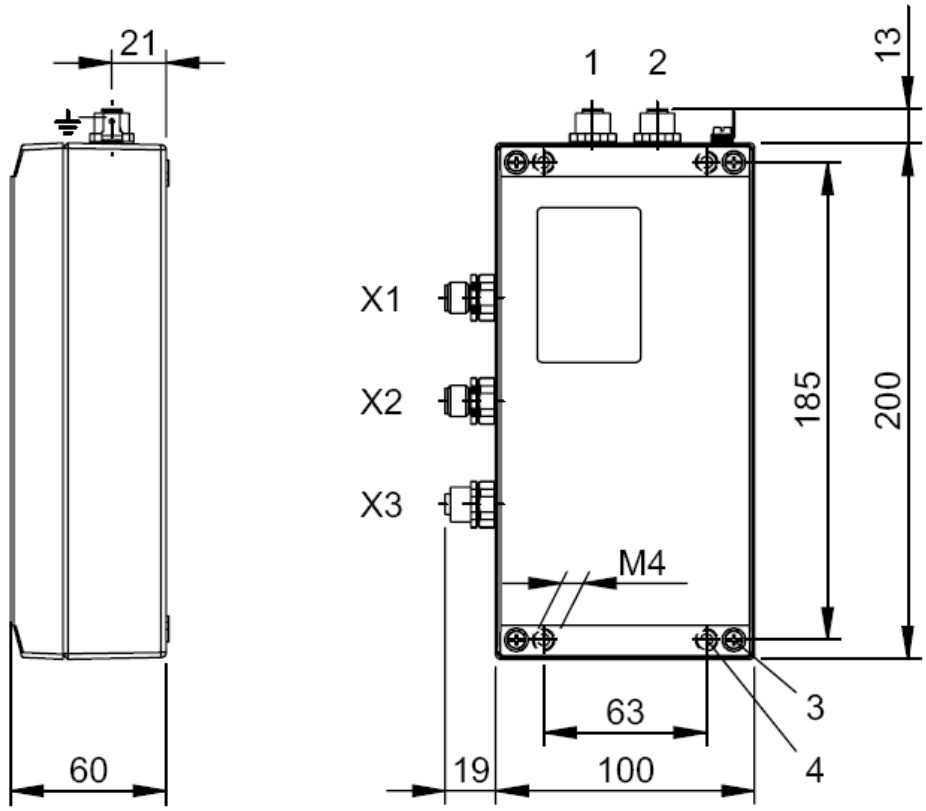


Function of each Component

Component	Function
Data carrier	A data medium that stores and retains information (data).
Read/write head	It reads and writes data carrier information/data without physical contact as well as supplies power for data carrier.
Processor	When it receives instructions from sequencer CPU, it executes reading or writing data to or from data carrier. It can be connected 1 or 2 read/write head(s).
CC-Link Master/Local Station	A sequencer CPU unit which instructs for CC-link and a master unit station which controls CC-Link system.

5. Technical Data

5.1 Dimension



1 Connector head 2
2 Connector head 1
3 Tightening torque 0,8…1,2 Nm,
4 Tightening torque 7,8... 11,8 Nm,

5.2 Mechanical Data

Housing material	GD-Al
X1 – POWER	5 pin, male, M12, a-coded
X2 – CC-Link In	5 pin, male, M12, a-coded
X3 – CC-Link Out	5 pin, female, M12, a-coded
Head 1, 2 (read/write head connections)	8 pin, male, M12, a-coded
Enclosure rating	IP65 (with connectors)
Weight	1150 g
Mounting screw for unit	4 x M4 x 25 mm – 8.8-A2B D912 (Tightening torque :7,8...11,8Nm)

5.3 Electrical Data

Supply voltage VS	24 V DC ±10 % LPS / Class 2 supplied only
Ripple	≤ 10 %
Current draw	≤ 800 mA
Device interface	CC-Link

5.4 Operating Conditions

Ambient temperature range	0 °C…+55 °C
Storage temperature	-20 °C...+75 °C
EMC	
– EN 61000-4-2/3/4/5/6	– Schärfegrad 2A/2A/3B/2B/XA
– EN 55016-2-3	– class A
Vibration/ Shock	EN 60068 Part 2-6/27/29/64/32
Operating atmosphere	Without corrosive gas, heavy dust

5.5 Function Indicators

BIS operating states for Head 1 and 2	SD	head is sending data	LED red
	RD	head is receiving data	LED red
	ID-ERR.	error	LED red
	IN-Z	data carrier is in zone	LED red
CC-Link status	PW	power on	LED red
	RUN	operating normally	LED red
	L RUN	communicating normally	LED red
	SD	sending data to CC-Link	LED red
	RD	receiving data from CC-Link	LED red
	L-ERR.	Communicating data error	LED red

Note
For detailed description see ‘‘8. Indications and Settings" on the Technical Description.

Appendix

A1 BIS M-699 Ordering information

Type designation code **BIS M–699–052–050–03–ST11**

Balluff Identifications-System

Series M Read/Write System

Hardware type
699 = Metal housing

Software type
052 = CC-Link

Version
050 = with two connectors for external read/write heads type BIS M-3_ _

Interface
03 = CC-Link

Customer connection
ST11 = Connector types
X1 = 5 pole, male, M12, a-coded
X2 = 5 pole, male, M12, a-coded
X3 = 5 pole, female, M12, a-coded

A2 Accessories (optional, not included)

Type		**Ordering code**
Cover cap	for Head 1, Head 2 X3 CC-Link out	Cover cap, M12 female (121 671)
Connector	for X1 female	BKS-S 79-00
	for X2 female	BKS-S 92-00
	for X3 male	BKS-S 94-00
CC-Link	cable	show Industrial Networking und Connectivity catalogue
	T- Adapter	show Industrial Networking und Connectivity catalogue
	Terminator	show Industrial Networking und Connectivity catalogue

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