Momentum using Unity Pro

Fipio Communicator Setup Manual

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When devices are used for applications with technical safety requirements, the relevant instructions must be followed.

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Table of Contents

Safety Information

Important Information

NOTICE

Read these instructions carefully, and look at the equipment to become familiar with the device before trying to install, operate, or maintain it. The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

The addition of this symbol to a “Danger” or “Warning” safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠ DANGER

DANGER indicates a hazardous situation which, if not avoided, **will result in** death or serious injury.

⚠ WARNING

WARNING indicates a hazardous situation which, if not avoided, **could result in** death or serious injury.

⚠ CAUTION

CAUTION indicates a hazardous situation which, if not avoided, **could result** in minor or moderate injury.

NOTICE

NOTICE is used to address practices not related to physical injury.

PLEASE NOTE

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A qualified person is one who has skills and knowledge related to the construction and operation of electrical equipment and its installation, and has received safety training to recognize and avoid the hazards involved.

About the Book

At a Glance

Document Scope

This manual describes how to install hardware and software for the Momentum communicator on a Fipio bus.

Validity Note

This documentation is valid for Unity Pro V8.1 or later.

The technical characteristics of the devices described in this document also appear online. To access this information online:

Step	Action
1	Go to the Schneider Electric home page *www.schneider-electric.com*.
2	In the **Search** box type the reference of a product or the name of a product range. ● Do not include blank spaces in the model number/product range. ● To get information on grouping similar modules, use asterisks (*).
3	If you entered a reference, go to the **Product Datasheets** search results and click on the reference that interests you. If you entered the name of a product range, go to the **Product Ranges** search results and click on the product range that interests you.
4	If more than one reference appears in the **Products** search results, click on the reference that interests you.
5	Depending on the size of your screen, you may need to scroll down to see the data sheet.
6	To save or print a data sheet as a .pdf file, click **Download XXX product datasheet**.

The characteristics that are presented in this manual should be the same as those characteristics that appear online. In line with our policy of constant improvement, we may revise content over time to improve clarity and accuracy. If you see a difference between the manual and online information, use the online information as your reference.

Related Documents

Title of Documentation	Reference Number
Premium and Atrium Using Unity Pro, Fipio Bus, Setup Manual	35008155 (English), 35008156 (French), 35008157 (German), 35013953 (Italian), 35008158 (Spanish), 35013954 (Chinese)

You can download these technical publications and other technical information from our website at www.schneider-electric.com.

Part I
Momentum on Fipio - General

Subject of this Part

This part demonstrates the use of Momentum modules on the Fipio field bus.

What Is in This Part?

This part contains the following chapters:

Chapter 1
Fipio Bus and Momentum Modules

Aim of this Chapter

This chapter demonstrates the use of Momentum modules on the Fipio field bus.

What Is in This Chapter?

This chapter contains the following topics:

Introduction to Fipio

Introduction

Fipio is the field bus for Premium, Series 7 or Series 1000 PLCs. It allows the decentralization of the inputs/outputs of a PLC station and its industrial peripheral devices nearest to the operational part.

On Fipio, the cyclic variables are used to update the status of the remote inputs/outputs for the PLC cycle rhythm.

Variables and aperiodic message handling are used for all functions concerning configuration, adjustment, diagnostics and operator dialog.

No specific knowledge is required to develop a project using the Fipio field bus. The designer simply declares in the software the devices connected to the bus, as with the input/output modules in the rack. The Unity Pro software automatically generates the network operating parameters, which are then loaded into the PLC. Interlinked screens guide the operator in configuration and adjustment functions for devices connected to the bus.

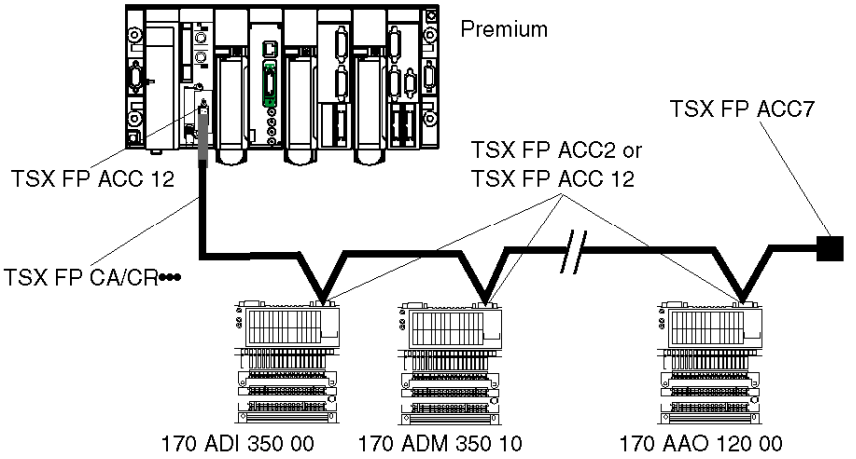
If the programming terminal is connected to the overriding address point 63, it can access only the Premium bus master and the agent PLCs. The terminals on the field bus are connected / disconnected without disturbing their operation.

Fipio Configuration with Momentum Modules

Connecting to Fipio Bus

The following accessories are used to connect the communicators:

- The **TSX FP ACC12** and **TSX FP ACC2** connectors for connecting the device to the Fipio bus.
- The **TSX FP CA/CR•••** main cable (available in 3 lengths: 100m, 200m or 500m).
- The **TSX FP ACC14•••** diversion cable (available in 3 lengths: 100m, 200m or 500m).
- The **TSX FP ACC14** and **TSX FP ACC4** diversion boxes.
- The **TSX FP ACC7** line end.
- The **TSX FP ACC12** connector for connecting to Premium PLCs.



Review of Momentum Base Catalog

General

There are two types of Momentum bases:

- standard bases, which are generally discrete
- advanced bases, which generally have at least one analog (ANA) or assimilated channel

Standard Momentum

Standard Momentum *(see page 86)* base references:

Discrete Input Bases	Discrete Output Bases	Discrete Input/Output Modules	Profile
170 ADI 340 00 170 ADI 350 00 170 ADI 540 50 170 ADI 740 50	170 ADO 340 00 170 ADO 350 00 170 ADO 530 50 170 ADO 540 50 170 ADO 730 50 170 ADO 740 50 170 ADO 830 30	170 ADM 350 10 170 ADM 350 11 170 ADM 350 15 170 ADM 370 10 170 ADM 390 10 170 ADM 390 30 170 ADM 690 50 170 ADM 690 51 170 ADM 850 10 170 ARM 370 30	Other FRD Other FRD_P

Advanced Momentum

Advanced Momentum *(see page 107)* base references:

Analog Input Bases	Analog Output Bases	Discrete and Analog Input/Output Modules	Special Bases	Profile
170 AAI 030 00 170 AAI 520 40 170 AAI 140 00	170 AAO 120 00 170 AAO 921 00	170 ANR 120 90 170 ANR 120 91 170 AMM 090 00	170 AEC 920 00	Other FSD Other FSD_P Other FED Other FED_P

Chapter 2
Introduction to Fipio Communicator

General Information

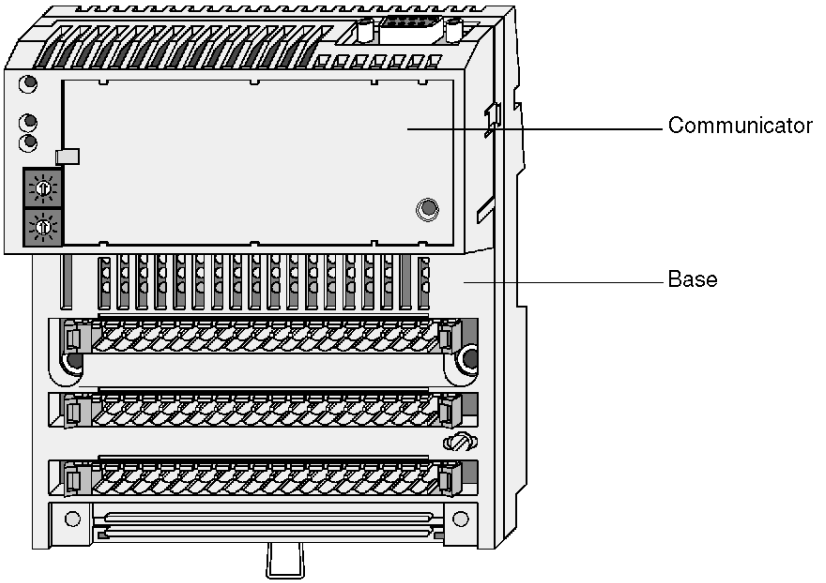
General

The **170 FNT 110 01** Fipio communicator establishes the interface between the Fipio bus, controlled by a Premium PLC and an input/output base from the Momentum product range.

The communicator is compatible with all Momentum catalog connection bases. It can only be used when connected to a base.

Illustration

The figure below shows a Fipio communicator mounted on a Momentum base.



NOTE: The communicator's power is supplied by the base to which it is connected.

Chapter 3
Installation

Aim of this Chapter

This chapter deals with the installation of the Fipio communicator for Momentum modules.

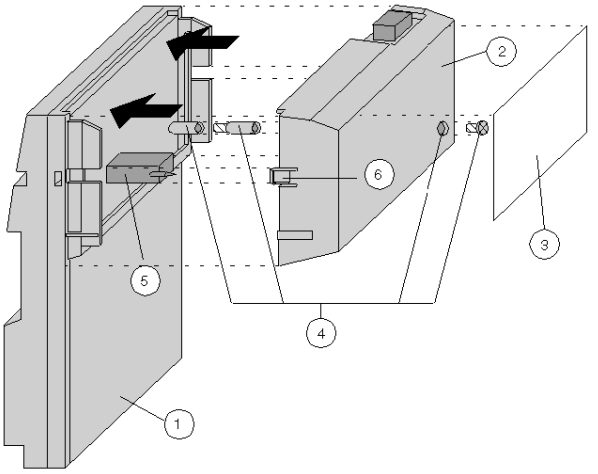
What Is in This Chapter?

This chapter contains the following topics:

Mounting the Fipio Communicator

Mounting

To mount the communicator on a Momentum base, please refer to the illustration below.



1 I/O base
2 communication or processor adapter
3 fill-in label
4 PE/FE connection (only for special bases)
5 ATI link connector
6 snap-on clip

Dismounting

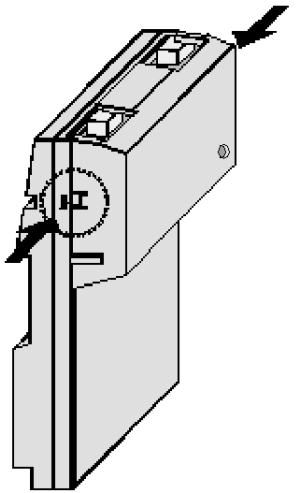
⚠ WARNING

POTENTIAL MODULE DAMAGE

- Use suitable anti-static measures when manipulating the module and avoid all contact with the internal elements.
  The electrical components in the module are sensitive to static electricity.
- Ensure that the I/O base is inoperative when it does not have a module. To ensure that the base is inoperative, do not insert the coupling connectors into the I/O base after mounting the module.
  I/O base electric circuits risk being exposed when a Momentum module is not mounted.
- Never power up the I/O base if it does not have a module. Ensure that the power is always off when the I/O base is not completely assembled.
  When the unit is powered, the base is also powered.
- To ensure that the base is inoperative, do not insert the coupling connectors into the I/O base after mounting the module. When withdrawing a module from a base, disconnect the limit connectors beforehand.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

To dismount the communicator, remove the plug using a screwdriver, as indicated in the illustration below and move the communicator upwards.



Connecting to the Fipio Bus

Accessories

The following accessories are used to connect the communicators:

- The **TSX FP ACC12** and **TSX FP ACC2** connectors for connecting the device to the Fipio bus.

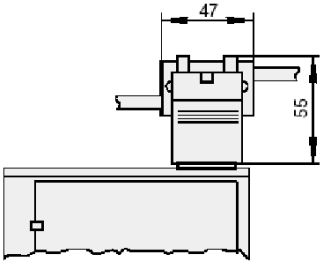
The TSX ACC2 connector has the advantage of being compact in relation to the TSX ACC12 connector, as shown in the following illustrations.

Connections

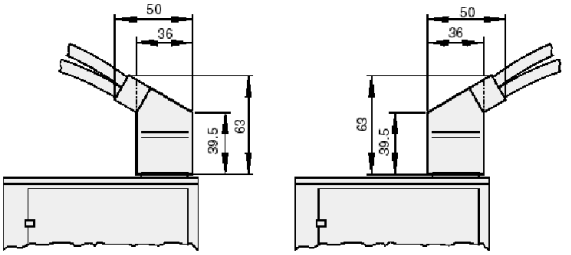
For further information on connecting and implementing a Fipio bus, please refer to the Fipio bus reference manual: **TSX DR FIP**.

The Fipio bus connections use the **TSX FP ACC12** or **TSX FP ACC2** connectors, as shown below.

Connection using the TSX FP ACC2 connector:



Connection using the TSX FP ACC12 connector:

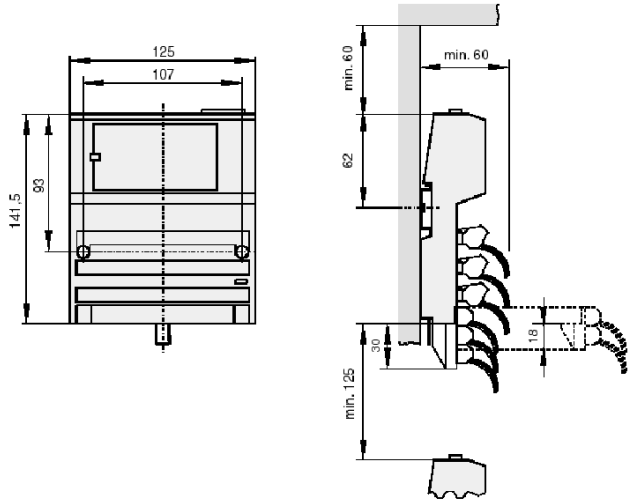


NOTE: It is necessary to ensure that for each hardware island, the garland of connectors is connected to at least one protective earth point.

Dimensions

The figure below shows the dimensions of a standard base connected to the Fipio bus. The minimum distances should be respected to allow a good air circulation.

When using the **TSX FP ACC12** connector, the free space below the base should be 150mm and not 60mm to allow the cables to pass.



Part II
Installation of Hardware for the Fipio Communicator on Momentum

Chapter 4
Description of the 170 FNT 110 01 Communicator

Aim of this Chapter

This chapter deals with the physical description of the **170 FNT 110 01** Fipio communicator module for Momentum.

What Is in This Chapter?

This chapter contains the following topics:

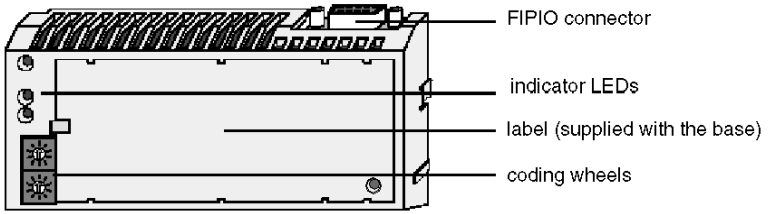
General Outlay of the Communicator

General

The **170 FNT 110 01** Fipio communicator serves as an interface between the Momentum I/O and the Fipio bus. The communicator is fixed on an input/output base *(see page 20)*.

Description

The following figure provides the description of the communicator's different functions.



Communicator Addressing

General

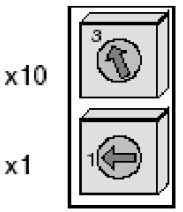
A device on the Fipio bus is identified by its connection point.

The connection point number represents its physical address on the Fipio bus and can take a value between 1 and 99.

On Fipio, the address 0 is reserved for the bus's PLC manager. The address 63 is reserved for the programming terminal.

Coding

The device address is coded using two mini coding wheels located on the communicator (see *Description, page 28*). The address is decimal coded.



Modifications to the address are only accepted after switching the device off and back on.

NOTE: If the address is modified when the device is switched on, this causes an internal fault and the device disconnects from the Fipio bus.

NOTE: Two devices on the Fipio bus should never have the same address. The simultaneous continued flashing of the 3 LEDs (RUN, ERR, COM) indicates that the device cannot be connected to the bus, as its address is already occupied by another device.

Description of the Indicator LEDs

General

The **170 FNT 110 01** communicator is equipped with three indicator LEDs (RUN, ERR, COM), which indicate the module status.

Meaning of LEDs

The table below lists the meaning of the communicator LEDs.

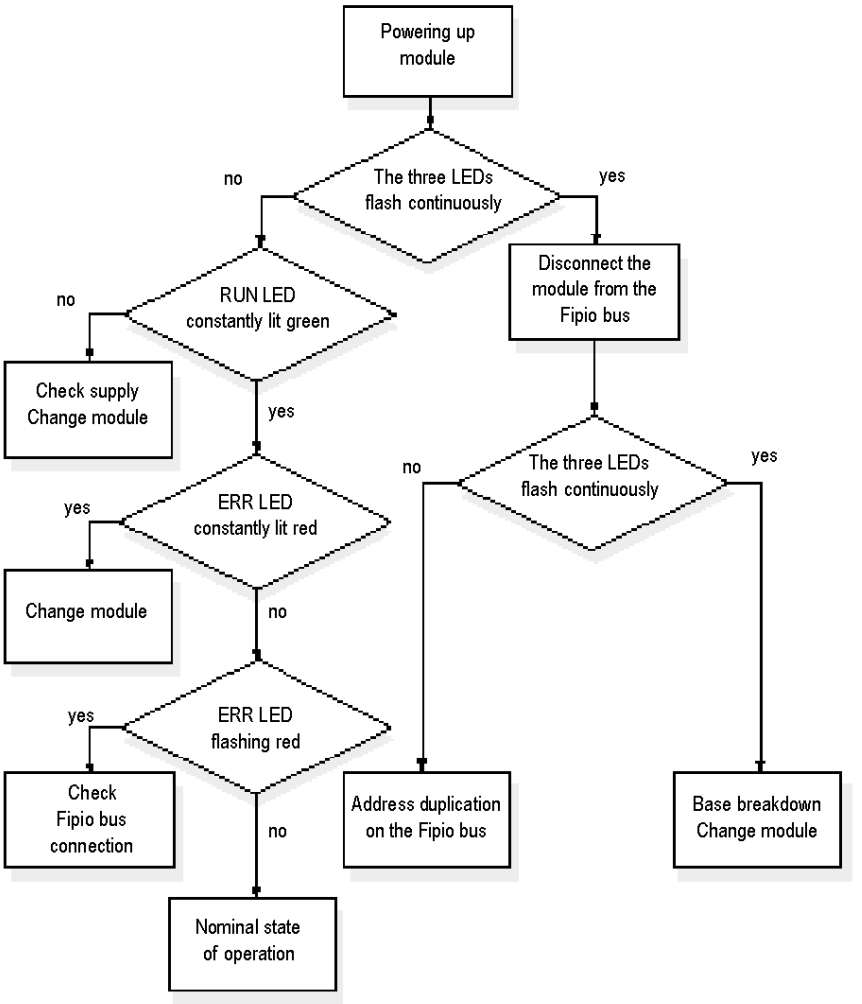
Label	Color	Meaning
RUN	**Green**	Switched on: **Off**: Device inoperative or totally inoperative. **Flashing**: Another device with the same address exists.
COM	**Yellow**	Communication activity: **Off**: Inactivity on the bus or communication stop. **Flashing**: ● During the device connection, self-test, initialization phases. ● When the device is part of the bus exchanges.
ERR	**Red**	Major fault: **Off**: Device in normal operation. **Flashing**: During the device connection, self-test and initialization phases and when the device is not logically connected to the network. **On**: Fault requiring replacement of the device or one of its modules (sub-set breakdown, assembly of incompatible modules, etc.).

NOTE: Depending on the type of base used, minor faults can be indicated (LEDs) on the base itself.

Visual Diagnostics

Diagnostics Help

Procedure to follow according to the status of the communicator's indicator LED:



Part III
Software Implementation

Subject of this Part

This part provides necessary information for the implementation and diagnostics of Momentum modules on a Fipio bus via the Unity Pro software.

What Is in This Part?

This part contains the following chapters:

Chapter 5
Fipio Bus Configuration

Subject of this Chapter

This chapter describes the configuration aspect of the installation of the Fipio bus.

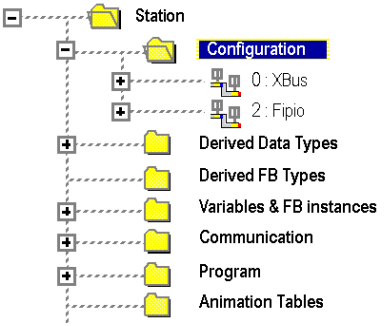
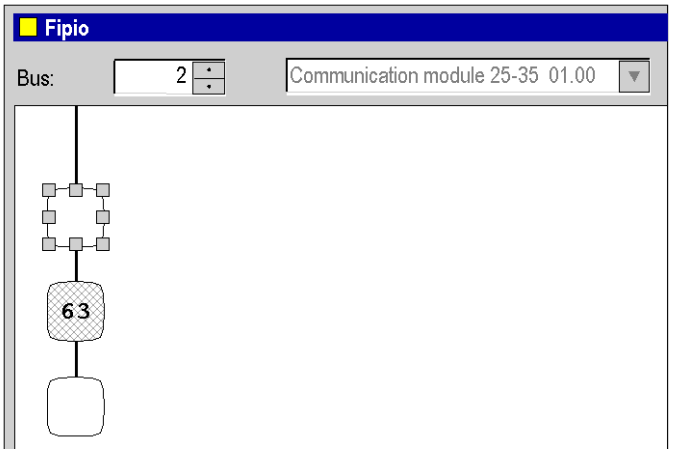
What Is in This Chapter?

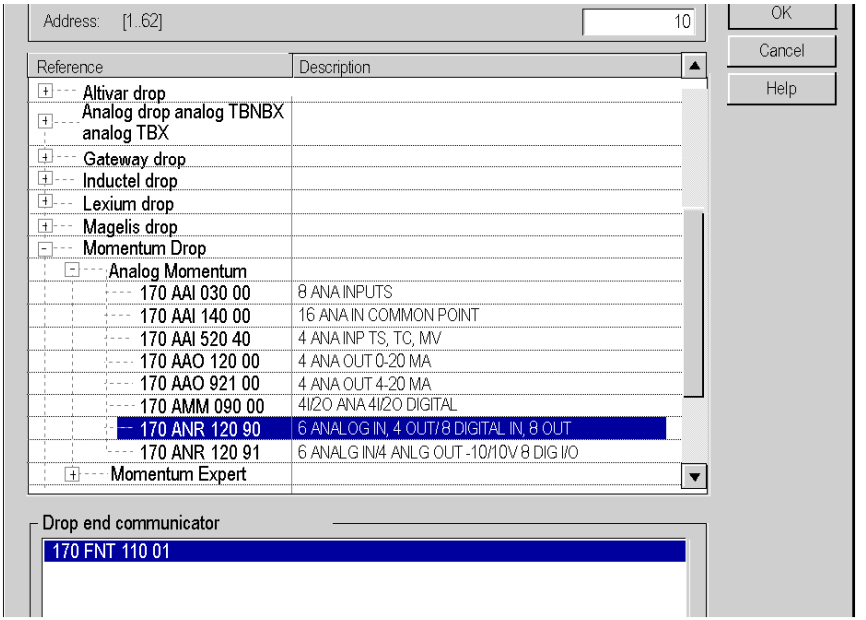
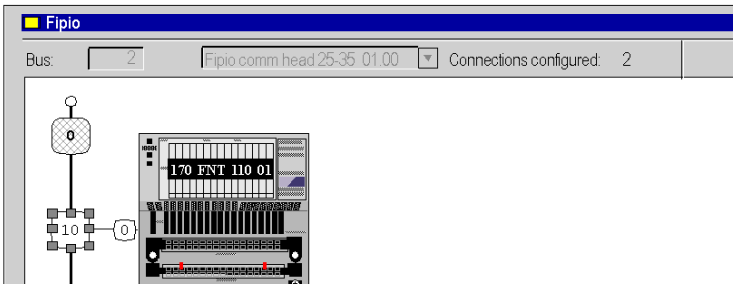
This chapter contains the following topics:

How to Insert a Momentum Module on the Fipio Bus

Procedure

The following table shows the procedure for inserting a Momentum module (in this example, the 170 ANR 120 90) on the Fipio bus.

Step	Action
1	From the project navigator, deploy the **Configuration** directory. **Result**: The following screen appears: 
2	Select the Fipio sub-directory and select the **Open** command using the contextual menu. **Result**: The **Fipio** window appears. 

Step	Action
3	Right-click on the logical address of the connection point, at the location where the module has to be connected (available addresses from 1 to 62 and 64 to 127, addresses 0 and 63 being reserved by the system). **Result**: The **New Device** screen appears. 
4	Enter the number of the connection point corresponding to the address. By default, the Unity Pro software offers the first free address.
5	In the **Reference** field, enter the type of device to connect to the bus.
6	Validate with **OK**. **Result**: The module is declared. 

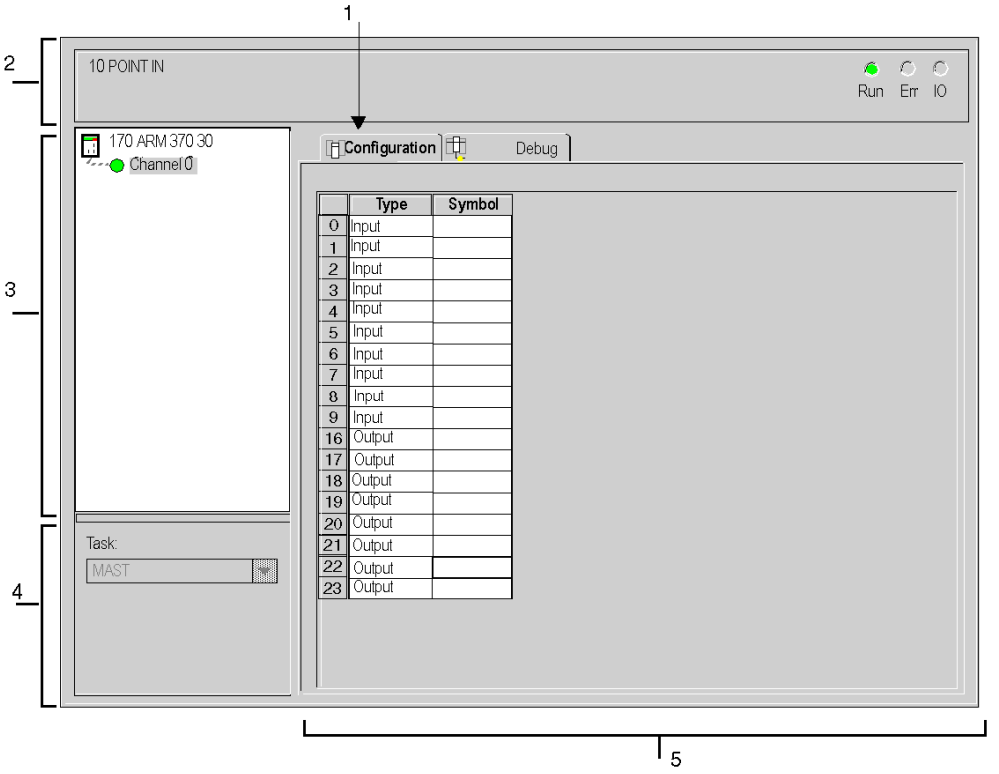
Configuration of Momentum Discrete Modules

At a Glance

This screen, divided into several areas, is used to configure Momentum discrete modules, except module **170 ADM 390 10**.

Illustration

The following figure shows an example of a configuration screen.



Description

The next table shows the various elements of the configuration screen and their functions.

Number	Element	Function
1	Tabs	The tab in the foreground indicates the mode in progress (**Configuration** in this example). Every mode can be selected using the respective tab. The available modes are: ● **Configuration** ● **Debug** (accessible only in online mode)
2	**Module** area	Gives a reminder of the device's shortened name.

3	**Channel** area	Is used:
		● By clicking on the device reference number, to display the tabs:
		  ● **Description**, which gives the characteristics of the device
		  ● **I/O Objects**, which is used to presymbolize the input/output objects
		  ● **Fault**, which shows the device faults
		● By clicking on the **Channel**, to select the channel to be debugged. To the left of the symbol there is a copy of the channel LED.

4	**General parameters** area	This area is used to define the (**MAST** or **FAST**) task.
5	**Configuration** area	This area can be used to view the symbols of the module inputs and/or outputs.

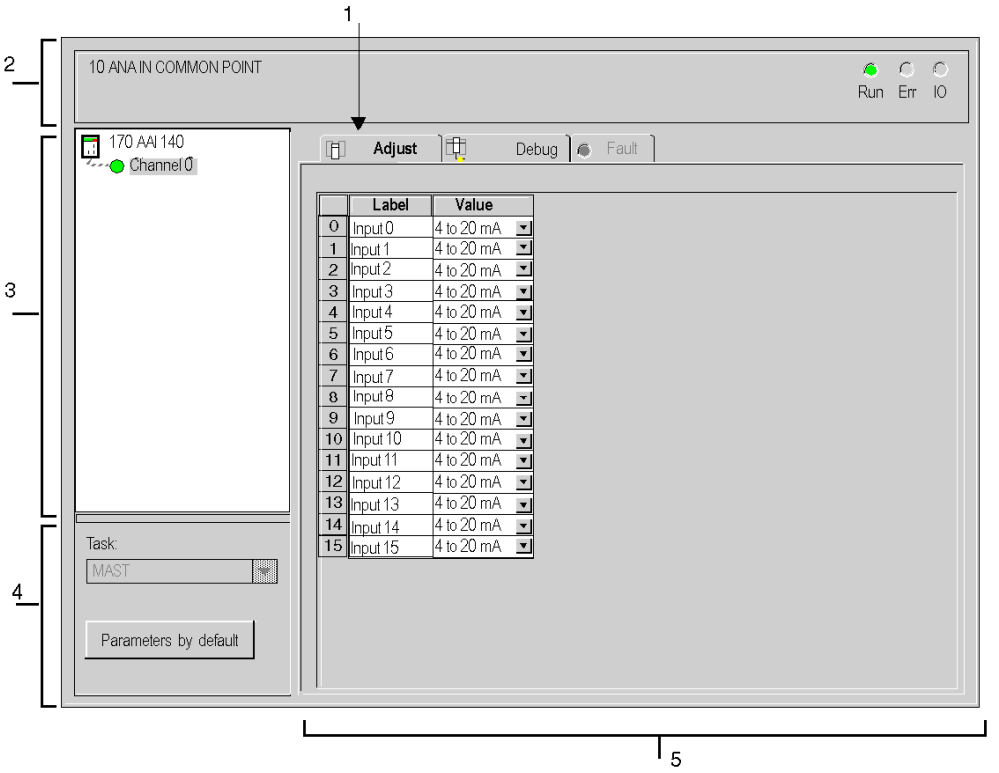
Configuration of Momentum Analog Modules

At a Glance

This screen, divided into several areas, is used to configure Momentum analog modules.

Illustration

The following figure shows an example of a configuration screen.



Description

The next table shows the various elements of the configuration screen and their functions.

Number	Element	Function
1	Tabs	The tab in the foreground indicates the mode in progress (**Adjust** in this example). Each mode can be selected using the respective tab. The available modes are: ● **Adjust** ● **Debug**, which can be accessed only in online mode ● **Fault** (at channel level), accessible only in online mode
2	**Module** area	Gives a reminder of the device's shortened name.

3	**Channel** area	Is used:
		● By clicking on the device reference number, to display the tabs:
		  ● **Description**, which gives the characteristics of the device
		  ● **I/O Objects**, which is used to presymbolize the input/output objects
		  ● **Fault**, which shows the device faults
		● By clicking on the **Channel**, to select the channel to be debugged. To the left of the symbol there is a copy of the channel LED.

4	**General parameters** area	This area is used to define the (**MAST** or **FAST**) task. The **Default parameters** button is used to apply the default parameters defined for the module.
5	**Configuration** area	This area can be used to select the type of analog input or output for each module input/output.

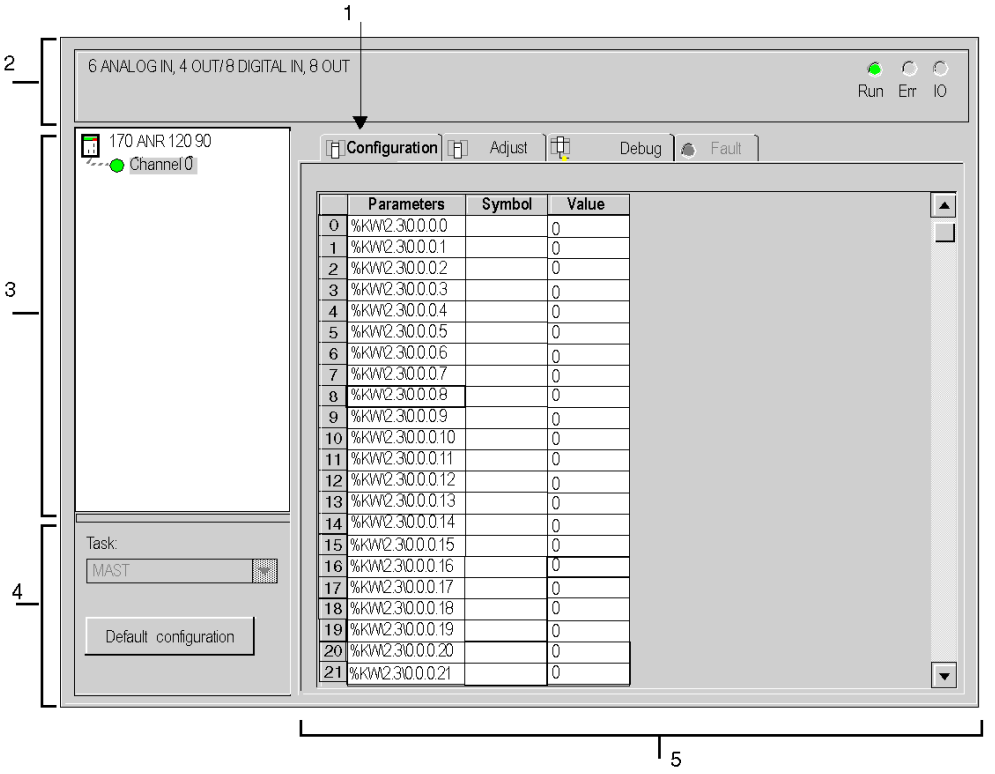
Configuration of Momentum modules with Standard Profiles

At a Glance

This screen, divided into several areas, is used to configure the configuration word bits of Momentum modules with standard profiles.

Illustration

The following figure shows an example of a configuration screen.



Description

The next table shows the various elements of the configuration screen and their functions.

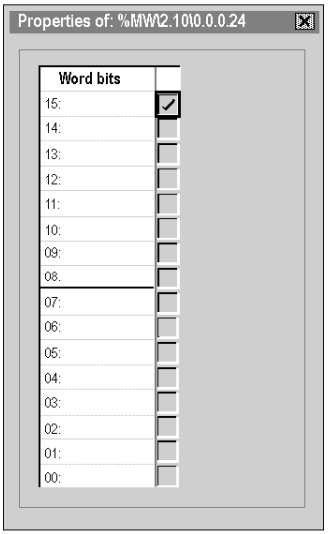
Number	Element	Function
1	Tabs	The tab in the foreground indicates the mode in progress (**Configuration** in this example). Every mode can be selected using the respective tab. The available modes are: ● **Configuration** ● **Adjust** ● **Debug**, which can be accessed only in online mode ● **Fault** (at channel level), accessible only in online mode
2	**Module** area	Gives a reminder of the device's shortened name.

3	**Channel** area	Is used:
		● By clicking on the device reference number, to display the tabs:
		  ● **Description**, which gives the characteristics of the device
		  ● **I/O Objects**, which is used to presymbolize the input/output objects
		  ● **Fault**, which shows the device faults
		● By clicking on the **Channel**, to select the channel to be debugged. To the left of the symbol there is a copy of the channel LED.

4	**General parameters** area	This area is used to define the (**MAST** or **FAST**) task. The **Default configuration** button is used to apply the default parameters defined for the module.
5	**Configuration** area	This area is used to modify configuration words.

Procedure

The following table shows the procedure for modifying values (configuration and adjustment) of a Momentum module with a standard profile (FSD and FED) using Unity Pro.

Step	Action
1	Select the module to be configured.
2	Using the contextual menu, click **Open Module**. **Result**: The configuration screen appears.
3	Select the **Adjust** tab.
4	Click in the **Value** entry field. **Result**: The window **Properties** appears. 
5	Configuration the value of the adjustment word bits.

Addressing of Remote Module Language Objects on a Fipio Bus

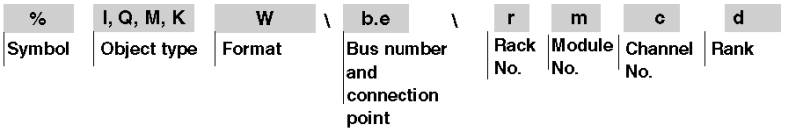
At a Glance

The addressing of the main bit and word objects of remote modules on the Fipio bus is performed on a geographical basis. That means that it depends on the position of the module and the channel:

- connection point
- rank of a bit or word in the channel

Illustration

Addressing is defined in the following way:



Syntax

The table below describes the different elements that make up addressing.

Family	Element	Values	Meaning
Symbol	%	-	-
Object type	I Q	- -	Image of the physical input of the module. Image of the physical output of the module. This information is exchanged automatically for each cycle of the task to which they are attached.
	M	-	Internal variable This read or write information is exchanged at the request of the project.
	K	-	Internal constant This configuration information is available as read only.
Format (size)	W	16 bit	Single length.
Module/channel address and connection point	b	2	Bus number.
	e	1 to 127	Connection point number.
Rack No.	r	0	Virtual rack number:
Module No.	m	0	0 : base module; no extension module exists for Momentum modules.
Channel No.	c	0 to 31 or MOD	Channel number MOD: channel reserved for managing the module and parameters common to all the channels.
Rank	d	0 to 49 or ERR	Rank of a bit or word in the channel.

Examples

The table below shows some examples of addressing objects.

Object	Meaning
%MW\2.1\0.0.8.2	Status word at rank 2 of input 8 of the Momentum module situated at connection point 1 on the Fipio bus.
%I\2.1\0.0.7	Image bit of input 7 of the Momentum module situated at connection point 1 on the Fipio bus.
%Q\2.1\0.0.2	Image bit of output 2 of the Momentum module situated at connection point 1 on the Fipio bus.
%I\2.2\0.0.MOD.ERR	Fault information for Momentum module situated at connection point 2 on the Fipio bus.
%I\2.3\0.0.0.ERR	Fault information for channel 0 of the Magelis module situated at connection point 3 on the Fipio bus.

Chapter 6
Debugging the Fipio Bus

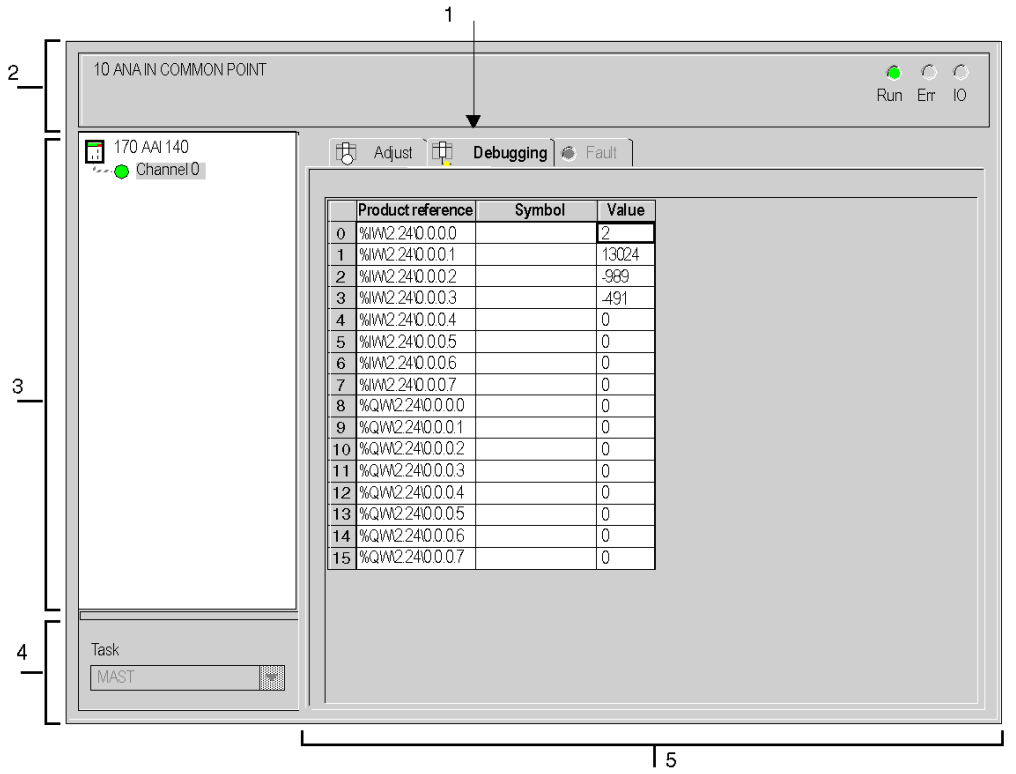
Debug Screen for a Momentum Module

At a Glance

This screen, divided into several areas, is used to debug Momentum modules.

Illustration

The figure below represents a debug screen.



	Product reference	Symbol	Value
0	%IW2.2.4.0.0.0.0		2
1	%IW2.2.4.0.0.0.1		13024
2	%IW2.2.4.0.0.0.2		-989
3	%IW2.2.4.0.0.0.3		-491
4	%IW2.2.4.0.0.0.4		0
5	%IW2.2.4.0.0.0.5		0
6	%IW2.2.4.0.0.0.6		0
7	%IW2.2.4.0.0.0.7		0
8	%QW2.2.4.0.0.0.0		0
9	%QW2.2.4.0.0.0.1		0
10	%QW2.2.4.0.0.0.2		0
11	%QW2.2.4.0.0.0.3		0
12	%QW2.2.4.0.0.0.4		0
13	%QW2.2.4.0.0.0.5		0
14	%QW2.2.4.0.0.0.6		0
15	%QW2.2.4.0.0.0.7		0

Description

The following table shows the different elements of the debug screen and their functions.

Number	Element	Function
1	Tabs	The tab in the foreground indicates the current mode (**Debugging** for this example). Each mode can be selected using the respective tab. The available modes are: ● **Debug**, accessible in online mode only ● **Fault** (channel level), accessible only in online mode ● **Adjust**
2	**Module** area	Gives a reminder of the device's shortened name. In the same area there are 3 LEDs which indicate the module's operating mode: ● **RUN** indicates the module's operating mode. ● **ERR** indicates an internal fault in the module. ● **I/O** indicates a fault from outside the module or an application fault.

3	**Channel** area	Is used:
		● By clicking on the reference number, to display the tabs:
		  ● **Description**, which gives the characteristics of the device
		  ● **I/O Objects**, which is used to presymbolize the input/output objects
		  ● **Fault**, which shows the device faults (in online mode)
		● **Channel:** single channel for a standard profile.
		● **Symbol:** name of the channel defined by the user (using the variable editor).

4	**Global Parameters** area	This area is used to display the type of task (**MAST** or **FAST**) in which the channel implicit exchange objects are exchanged.
5	**Parameters in progress** area	In cases where for the input bits module, the **%IW** input words or the **%QW** output words exist, this area displays them. A **Reference**, a **Symbol** and a **Value** are associated to each word. For each **value** the contextual menu can be used to select the display base for the value of the selected word. Three types are available: ● decimal ● hexadecimal ● binary

Chapter 7
Presentation of Language Objects of Momentum Modules on Fipio

Subject of this Chapter

This chapter describes the language objects associated with Momentum modules on Fipio.

What Is in This Chapter?

This chapter contains the following sections:

Section 7.1
Language Objects and IODDTs of Momentum Modules

Subject of this Section

This section presents general information about language objects and IODDTs of Momentum modules.

What Is in This Section?

This section contains the following topics:

Presentation of Language Objects Associated with Momentum Modules on a Fipio Bus

General

Momentum modules have different associated IODDTs.

The IODDTs are predefined by the manufacturer. They contain input/output language objects belonging to a channel of an application-specific module.

There are different types of IODDTs for Momentum modules on a Fipio bus:

- T_DIS_IN_GEN
- T_DIS_IN_MOM
- T_ANA_IN_GEN
- T_ANA_IN_MOM4
- T_ANA_IN_MOM8
- T_ANA_IN_MOM16
- T_ANA_DIS_IN_OUT_AMM
- T_ANA_OUT_MOM4
- T_DIS_OUT_GEN
- T_DIS_OUT_MOM
- T_STDP_GEN

NOTE: IODDT variables can be created in two different ways:

- Tab **I/O objects**
- Data Editor

Language Object Types

Each IODDT contains a group of language objects which are used to control them and check their operation.

There are two types of language objects:

- **Implicit exchange objects**, which are automatically exchanged on each cycle of the task associated with the module
- **Explicit exchange objects**, which are exchanged when requested to do so by the project, using explicit exchange instructions

Implicit exchanges concern the module inputs/outputs: process value results, information and commands.

Explicit exchanges are used to set up the module's parameters and for module diagnostics.

Implicit Exchange Language Objects Associated with the Application-Specific Function

At a Glance

An integrated application-specific interface or the addition of a module automatically enhances the language objects application used to program this interface or module.

These objects correspond to the input/output images and software data of the module or integrated application-specific interface.

Reminders

The module inputs (`%I` and `%IW`) are updated in the PLC memory at the start of the task, the PLC being in RUN or STOP mode.

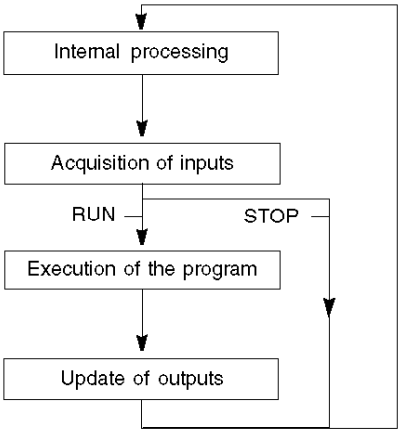
The outputs (`%Q` and `%QW`) are updated at the end of the task, only when the PLC is in RUN mode.

NOTE: When the task occurs in STOP mode, either of the following are possible, depending on the configuration selected:

- outputs are set to fallback position (fallback mode)
- outputs are maintained at their last value (maintain mode)

Figure

The following diagram shows the operating cycle of a PLC task (cyclical execution).



Explicit Exchange Language Objects Associated with the Application-Specific Function

At a Glance

Explicit exchanges are exchanges performed at the user program's request, and using instructions:

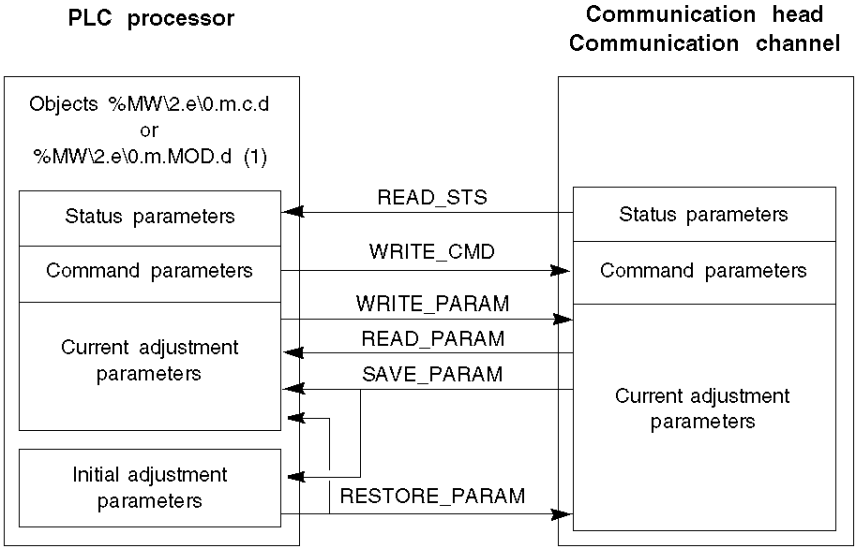
- READ_STS (read status words)
- WRITE_CMD (write command words)
- WRITE_PARAM (write adjustment parameters)
- READ_PARAM (read adjustment parameters)
- SAVE_PARAM (save adjustment parameters)
- RESTORE_PARAM (restore adjustment parameters)

These exchanges apply to a set of %MW objects of the same type (status, commands or parameters) that belong to a channel.

NOTE: These objects provide information about the module (e.g., type of channel fault, etc.), and are used to control the modules and to define their operating modes (saving and restoring currently applied adjustment parameters).

General Principle For Using Explicit Instructions

The diagram below shows the different types of explicit exchanges that can be made between the processor and module.



(1) Only with the instructions READ_STS and WRITE_CMD.

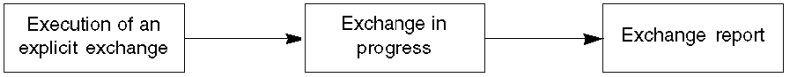
Managing exchanges

During an explicit exchange, it is necessary to check its performance in order that data is only taken into account when the exchange has been correctly executed.

To do this, two types of information are available:

- information concerning the exchange in progress *(see page 58)*
- the exchange report *(see page 58)*

The following diagram describes the management principle for an exchange:



NOTE: In order to avoid several simultaneous explicit exchanges for the same channel, it is necessary to test the value of the word EXCH_STS (`%MWr.m.c.0`) of the IODDT associated to the channel before to call any EF using this channel.

Management of Exchanges and Reports with Explicit Objects

At a Glance

When data is exchanged between the PCL memory and the module, the module may require several task cycles to acknowledge this information. All IODDTs use two words to manage exchanges:

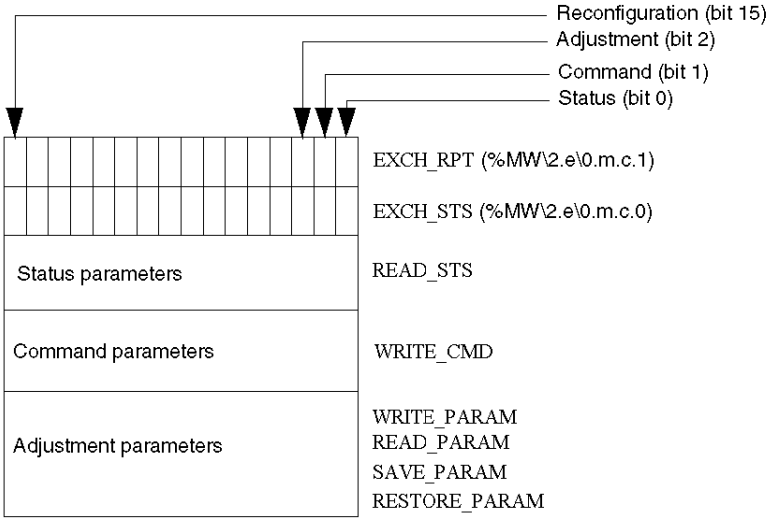
- `EXCH_STS` (%MW\2.e\0.m.c.0): exchange in progress
- `EXCH_RPT` (%MW\2.e\0.m.c.1): report

NOTE: Depending on the localization of the module, the management of the explicit exchanges `(%MW0.0.MOD.0.0 for example)will not be detected by the application:`

- For in-rack modules, explicit exchanges are done immediately on the local PLC Bus and are finished before the end of the execution task. So, the `READ_STS`, for example, is always finished when the `%MW0.0.MOD.0.0` bit is checked by the application.
- For remote bus (Fipio for example), explicit exchanges are not synchronous with the execution task. So, the detection is possible by the application.

Illustration

The illustration below shows the different significant bits for managing exchanges:



Description of the Significant Bits

Each bit of the words EXCH_STS (%MW\2.e\0.m.c.0) and EXCH_RPT (%MW\2.e\0.m.c.1) is associated with a type of parameter:

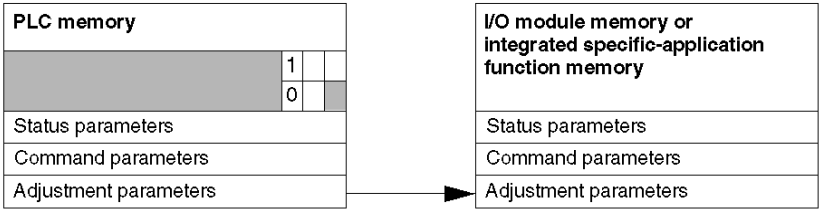
- Rank 0 bits are associated with the status parameters:
  - The STS_IN_PROGR bit (%MW\2.e\0.m.c.0.0) indicates whether a read request for the status words is in progress.
  - The STS_ERR bit (%MW\2.e\0.m.c.1.0) specifies whether a read request for the status words is refused by the module channel.
- Rank 1 bits are associated with the command parameters:
  - The CMD_IN_PROGR bit (%MW\2.e\0.m.c.0.1) indicates whether command parameters are being sent to the module channel.
  - The CMD_ERR bit (%MW\2.e\0.m.c.1.1) specifies whether the command parameters are refused by the module channel.
- Rank 2 bits are associated with the adjustment parameters:
  - The ADJ_IN_PROGR bit (%MW\2.e\0.m.c.0.2) indicates whether the adjustment parameters are being exchanged with the module channel (via WRITE_PARAM, READ_PARAM, SAVE_PARAM, RESTORE_PARAM).
  - The ADJ_ERR bit (%MW\2.e\0.m.c.1.2) specifies whether the adjustment parameters are refused by the module.
    If the exchange is correctly executed, the bit is set to 0.
- Rank 15 bits indicate a reconfiguration on channel c of the module from the console (modification of the configuration parameters + cold start-up of the channel).

NOTE: m stands for the position of the module; **c** stands for the channel number in the module.

NOTE: Exchange and report words also exist at module level EXCH_STS (%MW\2.e\0.m.MOD) and EXCH_RPT (%MW\2.e\0.m.MOD.1) in the IODDT type T_GEN_MOD.

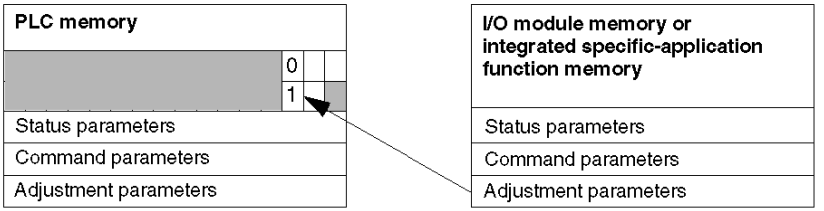
Example

Phase 1: Sending data by using the WRITE_PARAM instruction.



When the instruction is scanned by the PLC processor, the **Exchange in progress** bit is set to 1 in %MW\2.e\0.m.c.

Phase 2: Analysis of the data by the I/O module and report



When the data is exchanged between the PLC memory and the module, processing by the module is managed by the ADJ_ERR bit (%MW\2.e\0.m.c.1.2): Report (0 = correct exchange, 1 = faulty exchange).

NOTE: There is no adjustment parameter at module level.

Execution Indicators for an Explicit Exchange: EXCH_STS

The table below shows the control bits of the explicit exchanges: EXCH_STS (%MW\2.e\0.m.c.0).

Standard symbol	Type	Access	Meaning	Address
STS_IN_PROGR	BOOL	R	Reading of channel status words in progress	%MW\2.e\0m.c.0.0
CMD_IN_PROGR	BOOL	R	Command parameters exchange in progress	%MW\2.e\0m.c.0.1
ADJ_IN_PROGR	BOOL	R	Adjust parameters exchange in progress	%MW\2.e\0m.c.0.2
RECONF_IN_PROGR	BOOL	R	Reconfiguration of the module in progress	%MW\2.e\0.m.c.0.15

NOTE: If the module is not present or is disconnected, explicit exchange objects (Read_Sts for example) are not sent to the module (STS_IN_PROG (%MWr.m.c.0.0) = 0), but the words are refreshed.

Explicit Exchange Report: EXCH_RPT

The table below shows the report bits: EXCH_RPT (%MW\2.e\0.m.c.1).

Standard symbol	Type	Access	Meaning	Address
STS_ERR	BOOL	R	Error in reading status words of the channel (1 = failure)	%MW\2.e\0.m.c.1.0
CMD_ERR	BOOL	R	Error when exchanging command parameters (1 = failure)	%MW\2.e\0.m.c.1.1
ADJ_ERR	BOOL	R	Error when exchanging adjustment parameters (1 = failure)	%MW\2.e\0.m.c.1.2
RECONF_ERR	BOOL	R	Fault when reconfiguring the channel (1 = failure)	%MW\2.e\0.m.c.1.15

Section 7.2
Language Objects Associated with Momentum Modules

Subject of this Section

This section presents the language objects linked to Momentum modules.

What Is in This Section?

This section contains the following topics:

Details of T_DIS_IN_GEN-Type IODDT Implicit Exchange Objects

At a Glance

This part presents the implicit exchange objects for the T_DIS_IN_GEN-type IODDT applicable to all discrete input modules and inputs of mixed modules.

Input Indicator

The following table presents the meaning of the bit VALUE (%I\2.e\0.0.c).

Standard Symbol	Type	Access	Meaning	Number
VALUE	EBOOL	R	Indicates for input channel c that the output of the sensor controlling the input is activated	%I\2.e\0.0.c

Error Bit

The following table presents the meaning of the error bit CH_ERROR (%I\2.e\0.0.c.ERR).

Standard Symbol	Type	Access	Meaning	Number
CH_ERROR	BOOL	R	Indicates that input channel c is faulty	%I\2.e\0.0.c.ERR

Details of the Implicit Exchange Objects of the IODDT of the T_DIS_OUT_GEN Type

At a Glance

This section presents the implicit exchange objects for the T_DIS_OUT_GEN-type IODDT applicable to discrete output modules and outputs of mixed modules.

Output Indicator

The following table presents the meaning of the bit VALUE (%Q\2.e\0.0.c).

Standard Symbol	Type	Access	Meaning	Number
VALUE	EBOOL	R/W	Indicates that output channel c is activated	%Q\2.e\0.0.c

Error Bit

The following table presents the meaning of the error bit CH_ERROR (%I\2.e\0.0.c.ERR).

Standard Symbol	Type	Access	Meaning	Number
CH_ERROR	BOOL	R	Indicates that output channel c is faulty	%I\2.e\0.0.c.ERR

Details of the Implicit Exchange Objects of the IODDT of the T_DIS_IN_MOM Type

At a Glance

This section presents the implicit exchange objects for the `T_DIS_IN_MOM`-type IODDT applicable to Momentum input modules and inputs of mixed modules.

Input Indicator

The following table presents the meaning of the bit `VALUE` (%I\2.e\0.0.c).

Standard Symbol	Type	Access	Meaning	Number
`VALUE`	EBOOL	R	Indicates for input channel c that the output of the sensor controlling the input is activated	%I\2.e\0.0.c

Error Bit

The following table presents the meaning of the error bit `CH_ERROR` (%I\2.e\0.0.c.ERR).

Standard Symbol	Type	Access	Meaning	Number
`CH_ERROR`	BOOL	R	Indicates that input channel c is faulty	%I\2.e\0.0.c.ERR

Details of the Explicit Exchange Objects of the IODDT of the T_DIS_IN_MOM Type

At a Glance

This section presents the explicit exchange objects for the T_DIS_IN_MOM-type IODDT applicable to Momentum input modules. It includes the word type objects whose bits have a specific meaning. These objects are described in detail below.

Example of a declaration of a variable:

IODDT_VAR1 of the T_DIS_INT_MOM type

Observations

- In general, the meaning of the bits is given for bit status 1. In specific cases an explanation is given for each status of the bit.
- Not all bits are used.

Execution Indicators for an Explicit Exchange: EXCH_STS

The table below presents the meanings of the exchange control bits of the channel EXCH_STS (%MW\2.e\0.0.c.0).

Standard Symbol	Type	Access	Meaning	Number
STS_IN_PROGR	BOOL	R	Reading of channel status words in progress	%MW\2.e\0.0.c.0.0

Explicit Exchange Report: EXCH_RPT

The table below presents the meaning of the exchange report bits EXCH_RPT (%MW\2.e\0.0.c.1).

Standard Symbol	Type	Access	Meaning	Number
STS_ERR	BOOL	R	Error in reading status words of the channel (1 = failure)	%MW\2.e\0.0.c.1.0

Standard Channel Faults, CH_FLT

The table below shows the meaning of the bits of the status word CH_FLT (%MW\2.e\0.0.c.2). Reading is done by a READ_STS (IODDT_VAR1).

Standard Symbol	Type	Access	Meaning	Number
TMP_FLT	BOOL	R	Temporary major fault in the base	%MW\2.e\0.0.c.2.0
MINOR_FLT	BOOL	R	Minor fault outside the base	%MW\2.e\0.0.c.2.1
INTERNAL_FLT	BOOL	R	Internal fault: module not operational	%MW\2.e\0.0.c.2.4
CONF_FLT	BOOL	R	Hardware or software configuration fault	%MW\2.e\0.0.c.2.5
COM_FLT	BOOL	R	Bus communication fault	%MW\2.e\0.0.c.2.6

Details of the Implicit Exchange Objects of the IODDT of the T_DIS_OUT_MOM Type

At a Glance

This section presents the implicit exchange objects for the `T_DIS_OUT_MOM`-type IODDT applicable to Momentum output modules and outputs of mixed modules.

Input Indicator

The following table presents the meaning of the bit `VALUE` (%Q\2.e\0.0.c).

Standard Symbol	Type	Access	Meaning	Number
`VALUE`	EBOOL	R	Indicates for output channel c that the output of the sensor controlling the input is activated	%Q\2.e\0.0.c

Error Bit

The following table presents the meaning of the error bit `CH_ERROR` (%Q\2.e\0.0.c.ERR).

Standard Symbol	Type	Access	Meaning	Number
`CH_ERROR`	BOOL	R	Indicates that output channel c is faulty	%Q\2.e\0.0.c.ERR

Details of the Explicit Exchange Objects of the IODDT of the T_DIS_OUT_MOM Type

At a Glance

This section presents the explicit exchange objects for the T_DIS_OUT_MOM-type IODDT applicable to Momentum output modules and outputs of mixed modules. It includes the word type objects whose bits have a specific meaning. These objects are described in detail below.

Example of a declaration of a variable:

IODDT_VAR1 of the T_DIS_OUT_MOM type

Observations

- In general, the meaning of the bits is given for bit status 1. In specific cases an explanation is given for each status of the bit.
- Not all bits are used.

Execution Indicators for an Explicit Exchange: EXCH_STS

The table below presents the meanings of the exchange control bits of the channel EXCH_STS (%MW\2.e\0.0.c.0).

Standard Symbol	Type	Access	Meaning	Number
STS_IN_PROGR	BOOL	R	Reading of channel status words in progress	%MW\2.e\0.0.c.0.0

Explicit Exchange Report: EXCH_RPT

The table below presents the meaning of the exchange report bits EXCH_RPT (%MW\2.e\0.0.c.1).

Standard Symbol	Type	Access	Meaning	Number
STS_ERR	BOOL	R	Error in reading status words of the channel (1 = failure)	%MW\2.e\0.0.c.1.0

Standard Channel Faults, CH_FLT

The table below shows the meaning of the bits of the status word CH_FLT (%MW\2.e\0.0.c.2). Reading is done by a READ_STS (IODDT_VAR1).

Standard Symbol	Type	Access	Meaning	Number
TMP_FLT	BOOL	R	Temporary major fault in the base	%MW\2.e\0.0.c.2.0
MINOR_FLT	BOOL	R	Minor fault outside the base	%MW\2.e\0.0.c.2.1
INTERNAL_FLT	BOOL	R	Internal fault: module not operational	%MW\2.e\0.0.c.2.4
CONF_FLT	BOOL	R	Hardware or software configuration fault	%MW\2.e\0.0.c.2.5
COM_FLT	BOOL	R	Communication fault with PLC	%MW\2.e\0.0.c.2.6

Detail of the Language Objects of the IODDT of the T_ANA_IN_GEN Type

At a Glance

The tables below present the implicit exchange objects for the `T_ANA_IN_GEN`-type IODDT that are applicable to all analog input modules.

Input Value

The following table shows the analog value.

Standard Symbol	Type	Access	Meaning	Address
`VALUE`	INT	R	Analog input value	%IW\2.e\0.0.c.0

Errror Bit %I\2.e\0.0.c.ERR

The table below presents the error bit %I\2.e\0.0.c.ERR..

Standard Symbol	Type	Access	Meaning	Address
`CH_ERROR`	BOOL	R	Analog channel error bit	%I\2.e\0.0.c.ERR

Details of the IODDT Implicit Exchange Objects of the T_ANA_DIS_IN_OUT_AMM Type

At a Glance

The tables below present the implicit exchange objects of the IODDT of the T_ANA_DIS_IN_OUT_AMM type that are applicable to the 170 AMM 090 00 module.

Error Bit % Ir.m.c.ERR

The table below presents the error bit %I\2.e\0.0.c.ERR..

Standard Symbol	Type	Access	Meaning	Address
CH_ERROR	BOOL	R	Analog channel error bit	%I\2.e\0.0.c.ERR

Analog Inputs

The following table presents the meanings of the (%IW\2.e\0.0.c.0 to %IW\2.e\0.0.c.3) words.

Standard Symbol	Type	Access	Meaning	Address
ANA_IN1	INT	R	Measured analog value word for analog input 1	%IW\2.e\0.0.c.0
ANA_IN2	INT	R	Measured analog value word for analog input 2	%IW\2.e\0.0.c.1
ANA_IN3	INT	R	Measured analog value word for analog input 3	%IW\2.e\0.0.c.2
ANA_IN4	INT	R	Measured analog value word for analog input 4	%IW\2.e\0.0.c.3

Discrete Inputs DIS_VALUE_IN

The following table presents the meanings of the bits of the word DIS_VALUE_IN (%IW\2.e\0.0.c.4).

Standard Symbol	Type	Access	Meaning	Address
DIS_IN1	BOOL	R	Discrete input 1	%IW\2.e\0.0.c.4.0
DIS_IN2	BOOL	R	Discrete input 2	%IW\2.e\0.0.c.4.1
DIS_IN3	BOOL	R	Discrete input 3	%IW\2.e\0.0.c.4.2
DIS_IN4	BOOL	R	Discrete input 4	%IW\2.e\0.0.c.4.3

Analog Outputs

The following table presents the meanings of the (%QW\2.e\0.0.c.0 to %QW\2.e\0.0.c.1) words.

Standard Symbol	Type	Access	Meaning	Address
ANA_OUT1	INT	R/W	Measured analog value word for analog output 1	%QW\2.e\0.0.c.0
ANA_OUT2	INT	R/W	Measured analog value word for analog output 2	%QW\2.e\0.0.c.1

Discrete Outputs DIS_VALUE_OUT

The following table presents the meanings of the bits of the word DIS_VALUE_OUT (%QW\2.e\0.0.c.2).

Standard Symbol	Type	Access	Meaning	Address
DIS_OUT1	BOOL	R	Discrete output 1	%QW\2.e\0.0.c.2.0
DIS_OUT2	BOOL	R	Discrete output 2	%QW\2.e\0.0.c.2.1

Analog Input Parameters

The following table presents the meanings of the bits of the word PARAM_IN (%MW\2.e\0.0.c.4).

Standard Symbol	Type	Access	Meaning	Address
PARAM_IN	INT	R	The analog input configuration parameters are sent to the module via the communicator, in the form of words for configuring the input functioning mode. Each 4-bit byte of the word corresponds to an analog channel.	%MW\2.e\0.0.c.4

Configurations of Fallback Values for Analog Outputs

The following table presents the meanings of the bits of the word PARAM_OUT (%MW\2.e\0.0.c.5).

Standard Symbol	Type	Access	Meaning	Address
PARAM_OUT	INT	R	These parameters are sent to the module via the communicator, in the form of words for configuring the output functioning mode. Every 4-bit byte of this word corresponds to an analog channel.	%MW\2.e\0.0.c.5

Details of the Explicit Exchange Objects of the IODDT of the T_ANA_DIS_IN_OUT_AMM Type

At a Glance

This section presents the explicit exchange objects for the T_ANA_DIS_IN_OUT_AMM-type IODDT applicable to the Momentum **170 AMM 090 00**module. It includes the word type objects whose bits have a specific meaning. These objects are described in detail below.

Example of declaration of a variable: IODDT_VAR1 of the T_ANA_DIS_IN_OUT_AMM type

Observations

- In general, the meaning of the bits is given for bit status 1. In specific cases an explanation is given for each status of the bit.
- Not all bits are used.

Execution Indicators of an Explicit Exchange: EXCH_STS

The table below presents the meanings of the exchange control bits of the channel EXCH_STS (%MW\2.e\0.0.c.0).

Standard Symbol	Type	Access	Meaning	Address
STS_IN_PROGR	BOOL	R	Reading of channel status words in progress	%MW\2.e\0.0.c.0.0
CMD_IN_PROGR	BOOL	R	Current command parameters exchange in progress	%MW\2.e\0.0.c.0.1
ADJ_IN_PROGR	BOOL	R	Adjustment parameters exchange in progress	%MW\2.e\0.0.c.0.2

Explicit Exchange Report: EXCH_RPT

The table below presents the meaning of the exchange report bits EXCH_RPT (%MW\2.e\0.0.c.1).

Standard Symbol	Type	Access	Meaning	Address
STS_ERR	BOOL	R	Reading error for channel status words	%MW\2.e\0.0.c.1.0
CMD_ERR	BOOL	R	Error during a command parameter exchange (1 = failure)	%MW\2.e\0.0.c.1.1
ADJ_ERR	BOOL	R	Error during adjustment parameters exchange	%MW\2.e\0.0.c.1.2

Standard Channel Faults, CH_FLT

The table below shows the meaning of the bits of the status word CH_FLT (%MW\2.e\0.0.c.2). Reading is done by a READ_STS (IODDT_VAR1).

Standard Symbol	Type	Access	Meaning	Address
TMP_FLT	BOOL	R	Temporary major fault in the base	%MW\2.e\0.0.c.2.0
MINOR_FLT	BOOL	R	Minor fault outside the base	%MW\2.e\0.0.c.2.1
INTERNAL_FLT	BOOL	R	Channel failure	%MW\2.e\0.0.c.2.4
CONF_FLT	BOOL	R	Different hardware and software configurations	%MW\2.e\0.0.c.2.5
COM_FLT	BOOL	R	Communication fault with PLC	%MW\2.e\0.0.c.2.6
APPLI_FLT	BOOL	R	Application error (adjustment or configuration error)	%MW\2.e\0.0.c.2.7

Details of the Implicit Exchange Objects of the IODDT of the T_ANA_IN_MOM4 Type

At a Glance

This section presents the implicit exchange objects for the T_ANA_IN_MOM4-type IODDT applicable to the Momentum **170 AAI 520 40** module.

Error Bit

The following table presents the meaning of the error bit CH_ERROR (%I\2.e\0.0.c.ERR).

Standard Symbol	Type	Access	Meaning	Number
CH_ERROR	BOOL	R	Indicates that input channel c is faulty	%I\2.e\0.0.c.ERR

Analog Inputs

The following table presents the meanings of the (%IW\2.e\0.0.c.0 to %IW\2.e\0.0.c.3) words.

Standard Symbol	Type	Access	Meaning	Address
VALUE_IN1	INT	R	Measured analog value word for analog input 1	%IW\2.e\0.0.c.0
VALUE_IN2	INT	R	Measured analog value word for analog input 2	%IW\2.e\0.0.c.1
VALUE_IN3	INT	R	Measured analog value word for analog input 3	%IW\2.e\0.0.c.2
VALUE_IN4	INT	R	Measured analog value word for analog input 4	%IW\2.e\0.0.c.3

Details of the Explicit Exchange Objects of the IODDT of the T_ANA_IN_MOM4 Type

At a Glance

This section presents the explicit exchange objects for the T_ANA_IN_MOM4-type IODDT applicable to the Momentum **170 AAI 520 40** module. It includes the word type objects whose bits have a specific meaning. These objects are described in detail below.

Example of a declaration of a variable:

IODDT_VAR1 of the T_ANA_IN_MOM4 type

Observations

- In general, the meaning of the bits is given for bit status 1. In specific cases an explanation is given for each status of the bit.
- Not all bits are used.

Execution Indicators of an Explicit Exchange: EXCH_STS

The table below presents the meanings of the exchange control bits of the channel EXCH_STS (%MW\2.e\0.0.c.0).

Standard Symbol	Type	Access	Meaning	Address
STS_IN_PROGR	BOOL	R	Reading of channel status words in progress	%MW\2.e\0.0.c.0.0
CMD_IN_PROGR	BOOL	R	Current command parameters exchange in progress	%MW\2.e\0.0.c.0.1
ADJ_IN_PROGR	BOOL	R	Adjustment parameters exchange in progress	%MW\2.e\0.0.c.0.2

Explicit Exchange Report: EXCH_RPT

The table below presents the meaning of the exchange report bits EXCH_RPT (%MW\2.e\0.0.c.1).

Standard Symbol	Type	Access	Meaning	Address
STS_ERR	BOOL	R	Reading error for channel status words	%MW\2.e\0.0.c.1.0
CMD_ERR	BOOL	R	Error during a command parameter exchange (1 = failure)	%MW\2.e\0.0.c.1.1
ADJ_ERR	BOOL	R	Error during adjustment parameters exchange	%MW\2.e\0.0.c.1.2

Standard Channel Faults, CH_FLT

The table below shows the meaning of the bits of the status word CH_FLT (%MW\2.e\0.0.c.2). Reading is done by a READ_STS (IODDT_VAR1).

Standard Symbol	Type	Access	Meaning	Address
TMP_FLT	BOOL	R	Temporary major fault in the base	%MW\2.e\0.0.c.2.0
MINOR_FLT	BOOL	R	Minor fault outside the base	%MW\2.e\0.0.c.2.1
INTERNAL_FLT	BOOL	R	Channel failure	%MW\2.e\0.0.c.2.4
CONF_FLT	BOOL	R	Different hardware and software configurations	%MW\2.e\0.0.c.2.5
COM_FLT	BOOL	R	Communication fault with PLC	%MW\2.e\0.0.c.2.6
APPLI_FLT	BOOL	R	Application error (adjustment or configuration error)	%MW\2.e\0.0.c.2.7

Details of the Implicit Exchange Objects of the IODDT of the T_ANA_IN_MOM8 Type

At a Glance

This section presents the implicit exchange objects for the T_ANA_IN_MOM8-type IODDT applicable to the Momentum **170 AAI 030 00** module.

Error Bit

The following table presents the meaning of the error bit CH_ERROR (%I\2.e\0.0.c.ERR).

Standard Symbol	Type	Access	Meaning	Number
CH_ERROR	BOOL	R	Indicates that input channel c is faulty	%I\2.e\0.0.c.ERR

Analog Inputs

The following table presents the meanings of the (%IW\2.e\0.0.c.0 to %IW\2.e\0.0.c.7) words.

Standard Symbol	Type	Access	Meaning	Address
VALUE_IN1	INT	R	Measured analog value word for analog input 1	%IW\2.e\0.0.c.0
VALUE_IN2	INT	R	Measured analog value word for analog input 2	%IW\2.e\0.0.c.1
VALUE_IN3	INT	R	Measured analog value word for analog input 3	%IW\2.e\0.0.c.2
VALUE_IN4	INT	R	Measured analog value word for analog input 4	%IW\2.e\0.0.c.3
VALUE_IN5	INT	R	Measured analog value word for analog input 5	%IW\2.e\0.0.c.4
VALUE_IN6	INT	R	Measured analog value word for analog input 6	%IW\2.e\0.0.c.5
VALUE_IN7	INT	R	Measured analog value word for analog input 7	%IW\2.e\0.0.c.6
VALUE_IN8	INT	R	Measured analog value word for analog input 8	%IW\2.e\0.0.c.7

Details of the Explicit Exchange Objects of the IODDT of the T_ANA_IN_MOM8 Type

At a Glance

This section presents the explicit exchange objects for the T_ANA_IN_MOM8-type IODDT applicable to the Momentum **170 AAI 030 00** module. It includes the word type objects whose bits have a specific meaning. These objects are described in detail below.

Example of a declaration of a variable:

IODDT_VAR1 of the T_ANA_IN_MOM8 type

Observations

- In general, the meaning of the bits is given for bit status 1. In specific cases an explanation is given for each status of the bit.
- Not all bits are used.

Execution Indicators of an Explicit Exchange: EXCH_STS

The table below presents the meanings of the exchange control bits of the channel EXCH_STS (%MW\2.e\0.0.c.0).

Standard Symbol	Type	Access	Meaning	Address
STS_IN_PROGR	BOOL	R	Reading of channel status words in progress	%MW\2.e\0.0.c.0.0
CMD_IN_PROGR	BOOL	R	Current command parameters exchange in progress	%MW\2.e\0.0.c.0.1
ADJ_IN_PROGR	BOOL	R	Adjustment parameters exchange in progress	%MW\2.e\0.0.c.0.2

Explicit Exchange Report: EXCH_RPT

The table below presents the meaning of the exchange report bits EXCH_RPT (%MW\2.e\0.0.c.1).

Standard Symbol	Type	Access	Meaning	Address
STS_ERR	BOOL	R	Reading error for channel status words	%MW\2.e\0.0.c.1.0
CMD_ERR	BOOL	R	Error during a command parameter exchange (1 = failure)	%MW\2.e\0.0.c.1.1
ADJ_ERR	BOOL	R	Error during adjustment parameters exchange	%MW\2.e\0.0.c.1.2

Standard Channel Faults, CH_FLT

The table below shows the meaning of the bits of the status word CH_FLT (%MW\2.e\0.0.c.2). Reading is done by a READ_STS (IODDT_VAR1).

Standard Symbol	Type	Access	Meaning	Address
TMP_FLT	BOOL	R	Temporary major fault in the base	%MW\2.e\0.0.c.2.0
MINOR_FLT	BOOL	R	Minor fault outside the base	%MW\2.e\0.0.c.2.1
INTERNAL_FLT	BOOL	R	Channel failure	%MW\2.e\0.0.c.2.4
CONF_FLT	BOOL	R	Different hardware and software configurations	%MW\2.e\0.0.c.2.5
COM_FLT	BOOL	R	Communication fault with PLC	%MW\2.e\0.0.c.2.6
APPLI_FLT	BOOL	R	Application error (adjustment or configuration error)	%MW\2.e\0.0.c.2.7

Details of the Implicit Exchange Objects of the IODDT of the T_ANA_IN_MOM16 Type

At a Glance

This section presents the implicit exchange objects for the T_ANA_IN_MOM16-type IODDT applicable to the Momentum **170 AAI 140 00** module.

Error Bit

The following table presents the meaning of the error bit CH_ERROR (%I\2.e\0.0.c.ERR).

Standard Symbol	Type	Access	Meaning	Number
CH_ERROR	BOOL	R	Indicates that input channel c is faulty	%I\2.e\0.0.c.ERR

Analog Inputs

The following table presents the meanings of the (%IW\2.e\0.0.c.0 to %IW\2.e\0.0.c.15) words.

Standard Symbol	Type	Access	Meaning	Address
VALUE_IN1	INT	R	Measured analog value word for analog input 1	%IW\2.e\0.0.c.0
VALUE_IN2	INT	R	Measured analog value word for analog input 2	%IW\2.e\0.0.c.1
VALUE_IN3	INT	R	Measured analog value word for analog input 3	%IW\2.e\0.0.c.2
VALUE_IN4	INT	R	Measured analog value word for analog input 4	%IW\2.e\0.0.c.3
VALUE_IN5	INT	R	Measured analog value word for analog input 5	%IW\2.e\0.0.c.4
VALUE_IN6	INT	R	Measured analog value word for analog input 6	%IW\2.e\0.0.c.5
VALUE_IN7	INT	R	Measured analog value word for analog input 7	%IW\2.e\0.0.c.6
VALUE_IN8	INT	R	Measured analog value word for analog input 8	%IW\2.e\0.0.c.7
VALUE_IN9	INT	R	Measured analog value word for analog input 9	%IW\2.e\0.0.c.8
VALUE_IN10	INT	R	Measured analog value word for analog input 10	%IW\2.e\0.0.c.9
VALUE_IN11	INT	R	Measured analog value word for analog input 11	%IW\2.e\0.0.c.10
VALUE_IN12	INT	R	Measured analog value word for analog input 12	%IW\2.e\0.0.c.11
VALUE_IN13	INT	R	Measured analog value word for analog input 13	%IW\2.e\0.0.c.12
VALUE_IN14	INT	R	Measured analog value word for analog input 14	%IW\2.e\0.0.c.13
VALUE_IN15	INT	R	Measured analog value word for analog input 15	%IW\2.e\0.0.c.14
VALUE_IN16	INT	R	Measured analog value word for analog input 16	%IW\2.e\0.0.c.15

Details of the Explicit Exchange Objects of the IODDT of the T_ANA_IN_MOM16 Type

At a Glance

This section presents the explicit exchange objects for the T_ANA_IN_MOM16-type IODDT applicable to the Momentum **170 AAI 140 00** module. It includes the word type objects whose bits have a specific meaning. These objects are described in detail below.

Example of a declaration of a variable:

IODDT_VAR1 of the T_ANA_IN_MOM16 type

Observations

- In general, the meaning of the bits is given for bit status 1. In specific cases an explanation is given for each status of the bit.
- Not all bits are used.

Execution Indicators of an Explicit Exchange: EXCH_STS

The table below presents the meanings of the exchange control bits of the channel EXCH_STS (%MW\2.e\0.0.c.0).

Standard Symbol	Type	Access	Meaning	Address
STS_IN_PROGR	BOOL	R	Reading of channel status words in progress	%MW\2.e\0.0.c.0.0
CMD_IN_PROGR	BOOL	R	Current command parameters exchange in progress	%MW\2.e\0.0.c.0.1
ADJ_IN_PROGR	BOOL	R	Adjustment parameters exchange in progress	%MW\2.e\0.0.c.0.2

Explicit Exchange Report: EXCH_RPT

The table below presents the meaning of the exchange report bits EXCH_RPT (%MW\2.e\0.0.c.1).

Standard Symbol	Type	Access	Meaning	Address
STS_ERR	BOOL	R	Reading error for channel status words	%MW\2.e\0.0.c.1.0
CMD_ERR	BOOL	R	Error during a command parameter exchange (1 = failure)	%MW\2.e\0.0.c.1.1
ADJ_ERR	BOOL	R	Error during adjustment parameters exchange	%MW\2.e\0.0.c.1.2

Standard Channel Faults, CH_FLT

The table below shows the meaning of the bits of the status word CH_FLT (%MW\2.e\0.0.c.2). Reading is done by a READ_STS (IODDT_VAR1).

Standard Symbol	Type	Access	Meaning	Address
TMP_FLT	BOOL	R	Temporary major fault in the base	%MW\2.e\0.0.c.2.0
MINOR_FLT	BOOL	R	Minor fault outside the base	%MW\2.e\0.0.c.2.1
INTERNAL_FLT	BOOL	R	Channel failure	%MW\2.e\0.0.c.2.4
CONF_FLT	BOOL	R	Different hardware and software configurations	%MW\2.e\0.0.c.2.5
COM_FLT	BOOL	R	Communication fault with PLC	%MW\2.e\0.0.c.2.6
APPLI_FLT	BOOL	R	Application error (adjustment or configuration error)	%MW\2.e\0.0.c.2.7

Details of the Implicit Exchange Objects of the IODDT of the T_ANA_OUT_MOM4 Type

At a Glance

This section presents the implicit exchange objects for the `T_ANA_OUT_MOM4`-type IODDT applicable to the Momentum **170 AAO 921 00** and **170 AAO 120 00** modules.

Error Bit

The following table presents the meaning of the error bit `CH_ERROR` (%I\2.e\0.0.c.ERR).

Standard Symbol	Type	Access	Meaning	Number
`CH_ERROR`	BOOL	R	Indicates that input channel c is faulty	%I\2.e\0.0.c.ERR

Analog Outputs

The following table presents the meanings of the (%QW\2.e\0.0.c.0 to %QW\2.e\0.0.c.3) words.

Standard Symbol	Type	Access	Meaning	Address
`VALUE_OUT1`	INT	R	Value of analog output 1	%QW\2.e\0.0.c.0
`VALUE_OUT2`	INT	R	Value of analog output 2	%QW\2.e\0.0.c.1
`VALUE_OUT3`	INT	R	Value of analog output 3	%QW\2.e\0.0.c.2
`VALUE_OUT4`	INT	R	Value of analog output 4	%QW\2.e\0.0.c.3

Details of the Explicit Exchange Objects of the IODDT of the T_ANA_OUT_MOM4 Type

At a Glance

This section presents the explicit exchange objects for the T_ANA_OUT_MOM4-type IODDT applicable to the Momentum **170 AAO 921 00** and **170 AAO 120 00** modules. It includes the word type objects whose bits have a specific meaning. These objects are described in detail below.

Example of a declaration of a variable:

IODDT_VAR1 of the T_ANA_OUT_MOM4 type

Observations

- In general, the meaning of the bits is given for bit status 1. In specific cases an explanation is given for each status of the bit.
- Not all bits are used.

Execution Indicators of an Explicit Exchange: EXCH_STS

The table below presents the meanings of the exchange control bits of the channel EXCH_STS (%MW\2.e\0.0.c.0).

Standard Symbol	Type	Access	Meaning	Address
STS_IN_PROGR	BOOL	R	Reading of channel status words in progress	%MW\2.e\0.0.c.0.0
CMD_IN_PROGR	BOOL	R	Current command parameters exchange in progress	%MW\2.e\0.0.c.0.1
ADJ_IN_PROGR	BOOL	R	Adjustment parameters exchange in progress	%MW\2.e\0.0.c.0.2

Explicit Exchange Report: EXCH_RPT

The table below presents the meaning of the exchange report bits EXCH_RPT (%MW\2.e\0.0.c.1).

Standard Symbol	Type	Access	Meaning	Address
STS_ERR	BOOL	R	Reading error for channel status words	%MW\2.e\0.0.c.1.0
CMD_ERR	BOOL	R	Error during a command parameter exchange (1 = failure)	%MW\2.e\0.0.c.1.1
ADJ_ERR	BOOL	R	Error during adjustment parameters exchange	%MW\2.e\0.0.c.1.2

Standard Channel Faults, CH_FLT

The table below shows the meaning of the bits of the status word CH_FLT (%MW\2.e\0.0.c.2). Reading is done by a READ_STS (IODDT_VAR1).

Standard Symbol	Type	Access	Meaning	Address
TMP_FLT	BOOL	R	Temporary major fault in the base	%MW\2.e\0.0.c.2.0
MINOR_FLT	BOOL	R	Minor fault outside the base	%MW\2.e\0.0.c.2.1
INTERNAL_FLT	BOOL	R	Channel failure	%MW\2.e\0.0.c.2.4
CONF_FLT	BOOL	R	Different hardware and software configurations	%MW\2.e\0.0.c.2.5
COM_FLT	BOOL	R	Communication fault with PLC	%MW\2.e\0.0.c.2.6
APPLI_FLT	BOOL	R	Application error (adjustment or configuration error)	%MW\2.e\0.0.c.2.7

Details of the Language Objects for the IODDT of Type T_STDP_GEN

At a Glance

The tables below present the objects for the T_STDP_GEN-type IODDT that are applicable to all Fipio standard profiles.

Error Bit %I\2.e\0.m.c.ERR

The table below presents the error bit %I\2.e\0.m.c.ERR..

Standard Symbol	Type	Access	Meaning	Address
CH_ERROR	BOOL	R	Channel c error bit	%I\2.e\0.m.c.ERR

Execution Indicators of an Explicit Exchange: EXCH_STS

The table below presents the meanings of the exchange control bits of the channel EXCH_STS (%MW\2.e\0.m.c.0).

Standard Symbol	Type	Access	Meaning	Address
STS_IN_PROGR	BOOL	R	Reading of channel status words in progress	%MW\2.e\0.m.c.0.0
CMD_IN_PROGR	BOOL	R	Current command parameters exchange in progress	%MW\2.e\0.m.c.0.1
ADJ_IN_PROGR	BOOL	R	Adjustment parameters exchange in progress	%MW\2.e\0.m.c.0.2
RECONF_IN_PROGR	BOOL	R	Reconfiguration in progress	%MW\2.e\0.m.c.0.15

Explicit Exchange Report: EXCH_RPT

The table below presents the meaning of the exchange report bits EXCH_RPT (%MW\2.e\0.m.c.1).

Standard Symbol	Type	Access	Meaning	Address
STS_ERR	BOOL	R	Reading error for channel status words	%MW\2.e\0.m.c.1.0
CMD_ERR	BOOL	R	Error during command parameter exchange	%MW\2.e\0.m.c.1.1
ADJ_ERR	BOOL	R	Error during adjustment parameters exchange	%MW\2.e\0.m.c.1.2
RECONF_ERR	BOOL	R	Error when configuring the channel	%MW\2.e\0..m.c.1.15

Standard Channel Faults, CH_FLT

The following table presents the meanings of the bits of the CH_FLT status word (%MW\2.e\0.m.c.2). The reading is performed by a READ_STS (IODDT_VAR1).

Standard Symbol	Type	Access	Meaning	Address
INTERNAL_FLT	BOOL	R	Internal error or channel self-testing	%MW\2.e\0.m.c.2.4
CONF_FLT	BOOL	R	Hardware or software configuration error	%MW\2.e\0.m.c.2.5
COM_FLT	BOOL	R	Bus communication fault	%MW\2.e\0.m.c.2.6
APPLI_FLT	BOOL	R	Application fault (adjustment or configuration error)	%MW\2.e\0.m.c.2.7

Chapter 8
Addressing Momentum Modules

Subject of this Chapter

This chapter provides necessary information for configuring Momentum modules via the Unity Pro software.

What Is in This Chapter?

This chapter contains the following sections:

Section 8.1
Addressing I/O Discrete Momentum Standard Modules

Aim of this Section

This section provides information about the configuration of discrete input/output Momentum modules on Fipio.

What Is in This Section?

This section contains the following topics:

16-Channel Input Modules

Assignment of the Data Bits

The inputs are connected to connector 1 on the base.

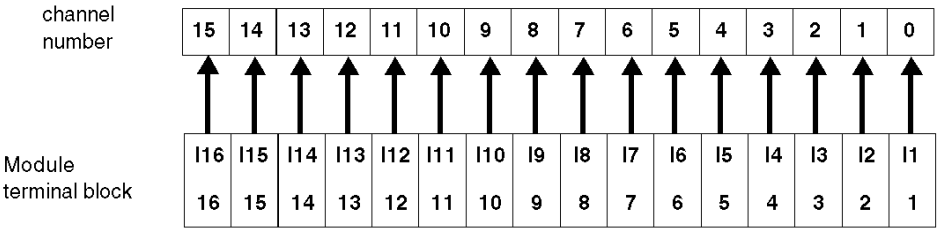
List of Momentums with 16 inputs:

- **170 ADI 340 00** (16 discrete inputs, 24 VDC)
- **170 ADI 540 50** (16 discrete inputs, 120 VAC)
- **170 ADI 740 50** (16 discrete inputs, 230 VAC)

Input Values

The image of the input channels is accessible bit by bit:

%I\2.e\0.0.c, with e = connection point number, c = channel number.



Labeling of the Terminal Blocks

170 ADI 340 00:

Connectors	Terminal Number	Meaning
1	1...16	Inputs
	17	0V (M–)
	18	Supply voltage (L+) + 24 VDC
2	1...17	Sensor power supply
	18	+24 VDC for inputs
3	1...17	0V for sensors (3- and 4-wire)
	18	0V for inputs
4	1...18	Protective earth (PE)

170 ADI 540 50:

Connectors	Terminal Number	Meaning
1	1...16	Inputs
	17	Reference potential – 120 VAC for the base (N)
	18	Base power supply 120 VAC (L1)
2	1...8	Power supply for input group 1 (1L1)
	9...16	Power supply for input group 2 (2L1)
	17	Power supply for input group 1 (1L1)
	18	Power supply for input group 2 (2L1)
3	1...8	Input group 1 – Reference potential (1N)
	9...16	Input group 2 – Reference potential (2N)
	17	Reference potential for input group 1 (1N)
	18	Reference potential for input group 2 (2N)

170 ADI 740 50:

Connectors	Terminal Number	Meaning
1	1...16	Inputs
	17	Reference potential – 230 VAC for the base (N)
	18	Base power supply 230 VAC (L1)
2	1...8	Power supply for input group 1 (1L1)
	9...16	Power supply for input group 2 (2L1)
	17	Power supply for input group 1 (1L1)
	18	Power supply for input group 2 (2L1)
3	1...8	Input group 1 – Reference potential (1N)
	9...16	Input group 2 – Reference potential (2N)
	17	Reference potential for input group 1 (1N)
	18	Reference potential for input group 2 (2N)

32-Channel Input Module

Assignment of the Data Bits

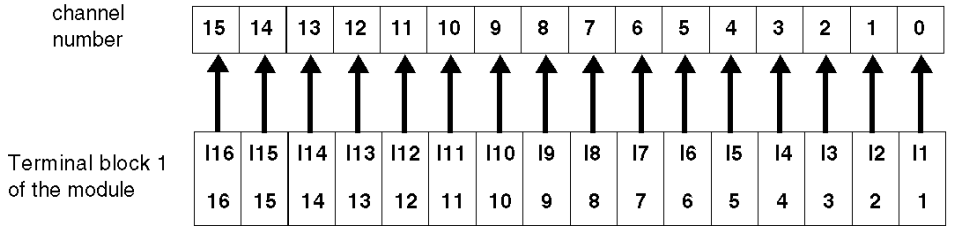
Inputs 1 to 16 are connected to terminal block 1 on the base. Inputs 17 to 32 are connected to terminal block 2.

Input Values

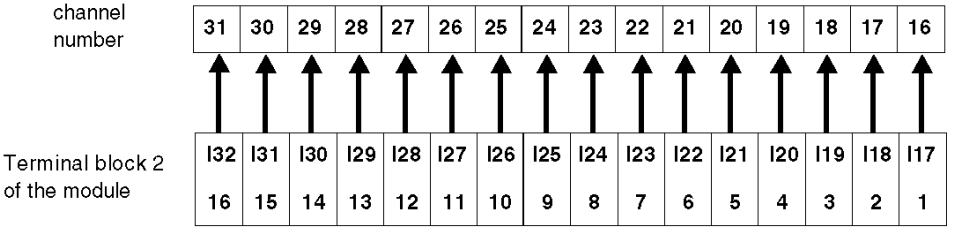
Input channel image accessible bit by bit:

%I\2.e\0.0.c, with e = connection point number, c = channel number.

Inputs 1 to 16:



Inputs 17 to 32:



Labeling of the Terminal Blocks

Connectors	Terminal Number	Meaning
1	1...16	Inputs for group 1
	17	0V (M–)
	18	Supply voltage (L+) + 24 VDC
2	1...16	Inputs for group 2
	17/18	24 VDC for input group 1 (1L+) and input group 2 (2L+)
3	1...16	Power supply for inputs 1 16
	17/18	0V (M–)
4	1...18	Power supply for inputs 17 32
5	1...18	0V (M–)
6	1...18	0V (M–) or protective earth (PE)

16-Channel Output Modules

Assignment of the Data Bits

The outputs are connected to connector 2 on the base.

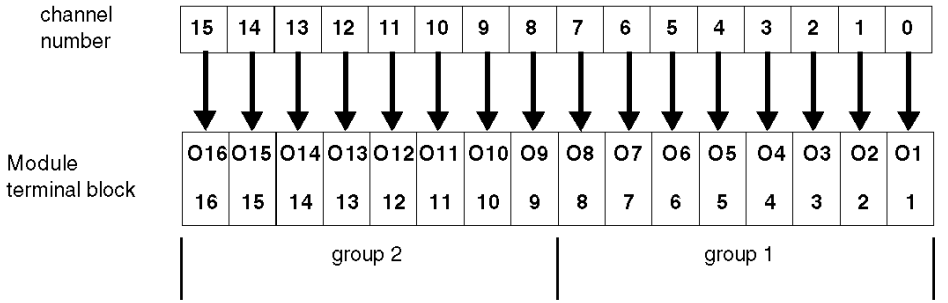
List of 16-output Momentums:

- **170 ADO 740 50** (16 discrete outputs in 2 groups, 230 VAC)
- **170 ADO 540 50** (16 discrete outputs in 2 groups, 120 VAC)
- **170 ADO 340 00** (16 discrete outputs in 2 groups, 24 VAC)

Output Values

Output channel image sent to the communicator bit by bit:

%Q\2.e\0.0.c, with e = connection point number, c = channel number.



Labeling of the Terminal Blocks

170 ADO 740 50:

Connectors	Terminal Number	Meaning
1	Fuse 1, Fuse 2	Output fuses
2	1...8	Output Group 1
	9...16	Output Group 2
	17	Reference potential for outputs (1N)
	18	Output power (1L1)
3	1...16	Reference potential per outputs (1N)
	17	Reference potential 230 VAC for the base (N)
	18	Base power supply 230 VAC (L1)

170 ADO 540 50:

Connectors	Terminal Number	Meaning
1	Fuse 1, Fuse 2	Output fuses
2	1...8	Output Group 1
	9...16	Output Group 2
	17	Reference potential for outputs (1N)
	18	Output power (1L1)
3	1...16	Reference potential per output (1N)
	17	Reference potential – 120 VAC for the base (N)
	18	Base power supply 120 VAC (L1)

170 ADO 340 00:

Connectors	Terminal Number	Meaning
1	Not used	
2	1...8	Output Group 1
	9...16	Output Group 2
	17/18	24 VAC for group 1 outputs and group 2 outputs (1L+, 2L+)
3	1...16	0V (M–) for outputs
	17	0V (M–) for the base and outputs
	18	Supply voltage (L+) + 24 VDC
4	1...18	Protective earth (PE)

8-Channel Output Modules

Assignment of the Data Bits

Output connections to base terminal block 2.

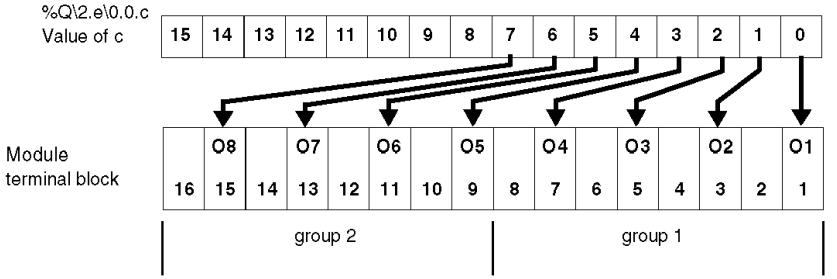
List of 8-output Momentums:

- **170 ADO 730 50** (8 discrete outputs in 2 groups, 230 VAC)
- **170 ADO 530 50** (8 discrete outputs in 2 groups, 120 VAC)

Output Values

Output channel image sent to the communicator bit by bit:

%Q\2.e\0.0.c, with e = connection point number, c = channel number.



Labeling of the Terminal Blocks

170 ADO 730 50 and 170 ADO 530 50:

Connectors	Terminal Number	Meaning
1	Fuse 1, Fuse 2	Output fuses
2	1, 3, 5, 7	Output Group 1
	9, 11, 13, 15	Output Group 2
	17	Reference potential for outputs (1N)
	18	Output power (1L1)
3	1...16	Reference potential per output (1N)
	17	Reference potential* for base (N)
	18	Base power supply* (L1)

* 120 VAC for 170 ADO 530 50 or 230 VAC for 170 ADO 730 50

6-Channel Output Module

Assignment of the Data Bits

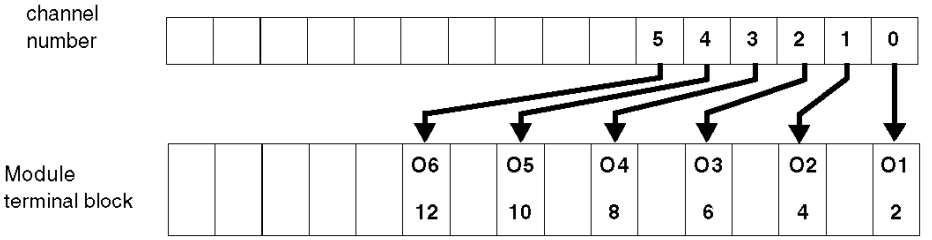
List of 6-output Momentums:

- **170 ADO 830 30** (6 discrete outputs in 6 groups (1 outputs/group), 120-230 VAC)

Output Values

Output channel image sent to the communicator bit by bit:

%Q\2.e\0.0.c, with e = connection point number, c = channel number.



Labeling of the Terminal Blocks

170 ADO 830 30:

Connectors	Terminal Number	Meaning
1	2, 4, 6, 8, 10, 12	Relay outputs 1 to 6 (normally open)
	17	Module neutral
	18	Module power supply (between 120 and 230 VAC)
2	2, 4, 6, 8, 10, 12	Relay outputs 1 to 6 (normally closed)
3	2, 4, 6, 8, 10, 12	Shared by relay outputs 1 to 6
4	1 ... 18	Protective earth (PE)

32-Channel Output Module

Assignment of the Data Bits

Inputs 1 to 16 are connected to terminal block 1 on the base. Inputs 17 to 32 are connected to terminal block 2.

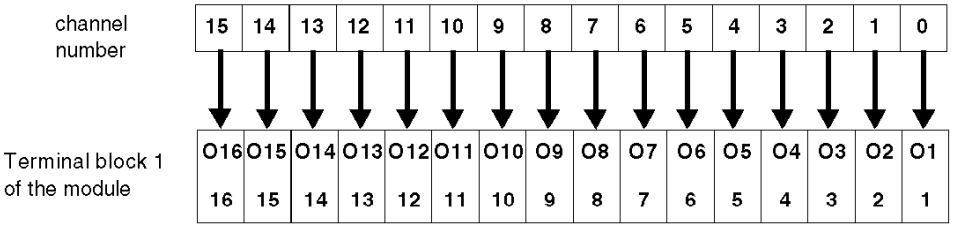
- **170 ADO 350 00** (32 discrete outputs in 2 groups, 24 VDC)

Output Values

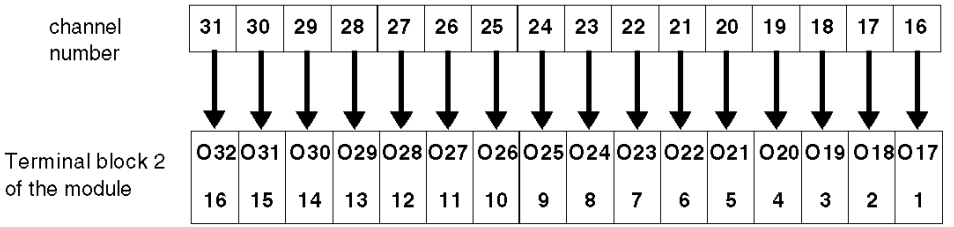
The image of the output channels is sent to the communicator via an output word:

%Q\2.e\0.0.c, with e = connection point number, c = channel number.

Outputs 1 to 16:



Outputs 17 to 32:



Labeling of the Terminal Blocks

Connectors	Terminal Number	Meaning
1	1...16	Output Group 1
	17	0V (M–) for the base
	18	Supply voltage (L+) + 24 VDC
2	1...16	Output Group 2
	17/18	24 VDC for Output Group 1 (1L+) and Output Group 2 (2L+)
3	1...16	0V (M–) for outputs
	17/18	0V (M–) for output groups
4	1...18	0V (M–)
5	1...18	Protective earth (PE)
6	1...18	Protective earth

Mixed Input and Output Modules

16 I / 16 O Modules

Output connections to base terminal block 2. Inputs connected to base terminal block 1.

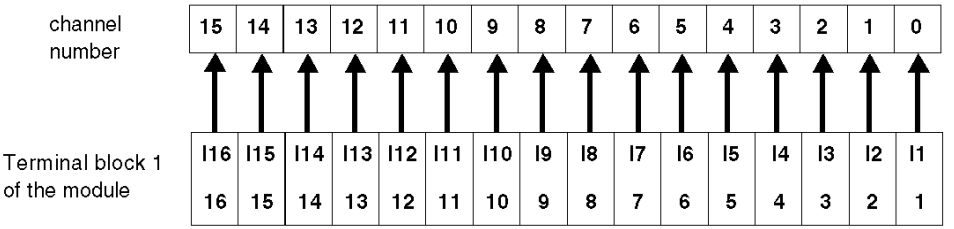
List of Momentums:

- **170 ADM 350 10**
- **170 ADM 350 11**
- **170 ADM 350 15**
- **170 ADM 850 10**

Input channel image accessible bit by bit:

%I\2.e\0.0.c, with e = connection point number, c = channel number.

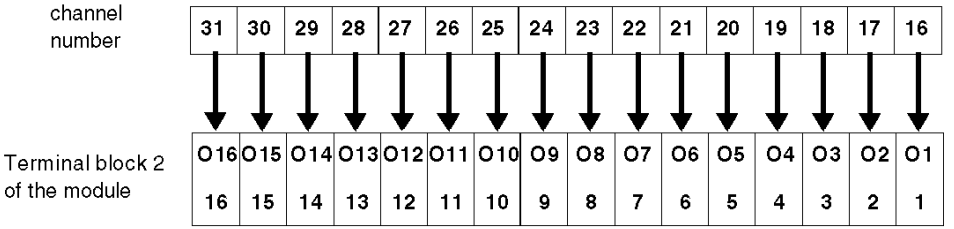
Inputs:



Output channel image sent to the communicator bit by bit:

%Q\2.e\0.0.c, with e = connection point number, c = channel number.

Outputs:



Terminal block labeling for bases **170 ADM 35010**, **170 ADM 35011** and **170 ADM 350 15**:

Connectors	Terminal Number	Meaning
1	1...16	Inputs
	17	0V (M–)
	18	Supply voltage (L+) + 24 VDC
2	1...8	Output Group 1
	9...16	Output Group 2
	17/18	24 VDC for Output Group 1 (1L+) and Output Group 2 (2L+)
3	1...16	0V for outputs
	17/18	0V (M–)
4	1...18	Power supply for inputs I1 I16 or PE
5	1...18	0V (M–)
6	1...18	Protective earth (PE)

Terminal block labeling for base **170 ADM 850 10**:

Connectors	Terminal Number	Meaning
1	1...16	Inputs
	17	0V (M–)
	18	Power supply voltage between 10VDC and 60VDC
2	1...16	Outputs
	17	0V (M–)
	18	Power supply voltage between 10VDC and 60VDC
3	1...16	Output return connections
	17	0V (M–)
	18	Input reference voltage between 10VDC and 60VDC

16 I / 8 O Modules

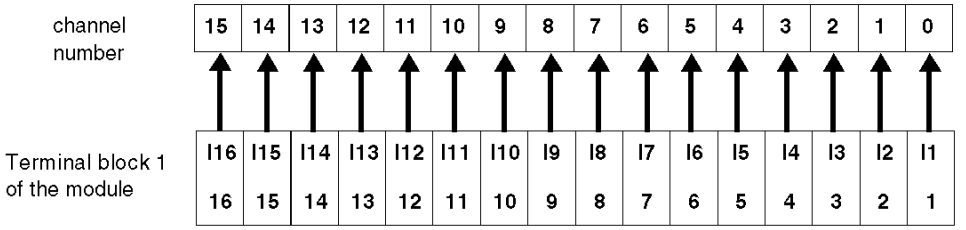
- **170 ADM 370 10**

Output connections to base terminal block 2. Input connections to base row 1.

Input channel image accessible bit by bit:

%I\2.e\0.0.c, with e = connection point number, c = channel number.

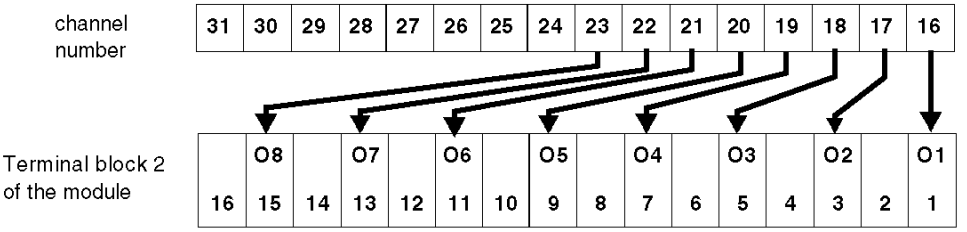
Inputs:



Output channel image sent to the communicator bit by bit:

%Q\2.e\0.0.c, with e = connection point number, c = channel number.

Outputs:



Terminal block labeling:

Connectors	Terminal Number	Meaning
1	1...16	Inputs
	17	0V (M–)
	18	Supply voltage (L+) + 24 VDC
2	1, 3, 5, 7	Output Group 1
	9, 11, 13, 15	Output Group 2
	2, 4, 6, 8	0V (1M–) for Output Group 1
	10, 12, 14, 16	0V (2M–) for Output Group 2
	17/18	24 VDC for Output Group 1 (1L+) and Output Group 2 (2L+)
3	1...4	Power supply for inputs 1 4 (L+)
	5...8	Power supply for inputs 5 8 (L+)
	8...12	Power supply for inputs 9 12 (L+)
	13...16	Power supply for inputs 13 16 (L+)
	17/18	0V (1M–, 2M–)
4	1...18	0V (M–) for the sensors
5	1...18	Protective earth (PE)

16 I / 12 O Modules

170 ADM 390 10:

Master sends 12 discrete output bits to base 170 ADM 390 10 in a 16 bit word. Base returns three 16 bit input words to the master.

- Fault detection:

First two words return input and output fault detection. First input word indicates fault detection for the 12 outputs.

Second input word indicates fault detection for the 16 inputs.

- I/O register assignments:

Third input word is for the sensors. Sensors are connected to base connector 1. Actuators (from the output word) are connected to base terminal block 2.

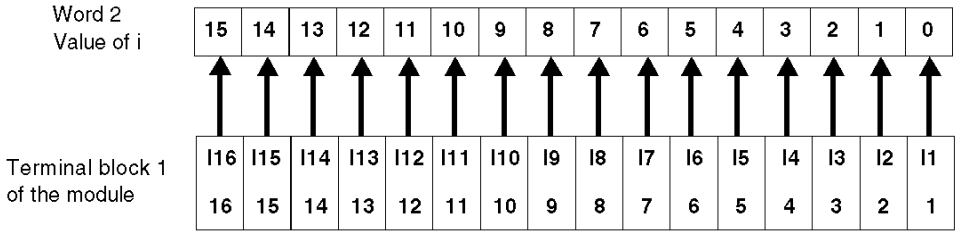
Address	Description	Bit
%IW\2.e\0.0.0.0	Output status word	0 = OK 1 = fault
%IW\2.e\0.0.0.1	Input status word	
%IW\2.e\0.0.0.2	Input value word	

Address	Description
%QW\2.e\0.0.0.0	Output word

Input channel image is accessible in an input word:

%IW\2.e\0.0.0.2.i

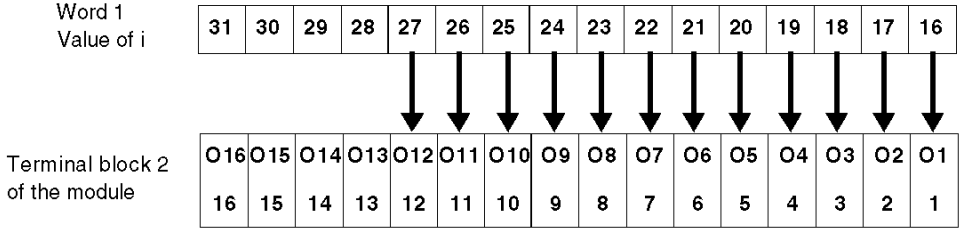
Inputs:



Output channel image is sent to the communicator bit by bit:

%QW\2.e\0.0.0.2.i

Outputs:



Terminal block labeling:

Connectors	Terminal Number	Meaning
1	1...16	Inputs
	17	0V (M–)
	18	Supply voltage (L+) + 24 VDC
2	1...8	Output Group 1
	9...12	Output Group 2
	13...16	Not Connected
	17/18	24 VDC for Output Group 1 and Output Group 2 (1L+, 2L+)
3	1...18	0V (M–)
4	1...18	Supply voltage for terminals 1 16, connector 1, or PE

10 I / 8 O Modules

Outputs are connected to base terminal block 2, and inputs to terminal block 1.

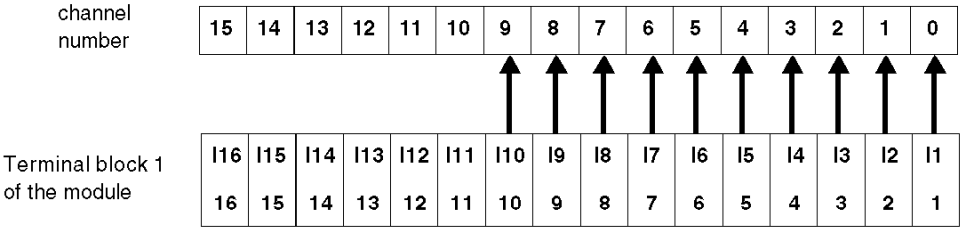
List of Momentums with 10 inputs and 8 outputs (10 discrete inputs in 1 group and 8 relay NO outputs in 2 groups):

- **170 ADM 390 30**
- **170 ARM 370 30**

Input channel image accessible via:

%I\2.e\0.0.c

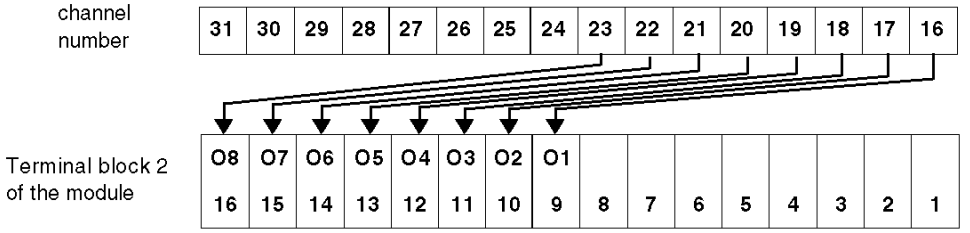
Inputs:



Output channel image sent to the communicator via:

%Q\2.e\0.0.c

Outputs:



170 ADM 390 30 terminal block labeling:

Connectors	Terminal Number	Meaning
1	1...10	Inputs
	11, 12, 16	Power supply for inputs 9, 10 (1L+)
	13, 14, 15	0V (M–) for inputs
	17	0V (M–) for the base
	18	Supply voltage (L+) + 24 VDC
2	1...8	Output power supply 1 ... 8 (1L+)
	9...12	Output Group 1
	13...16	Output Group 2
	17	Power supply for relay outputs 1 ... 4 (1L1, 20 ... 115 VDC or 24 ... 230 VAC)
	18	Power supply for relay outputs 5 ... 8 (2L1, 20 ... 115 VDC or 24 ... 230 VAC)
3	1...8	0V (M–) for inputs
	9, 10, 11, 12	0V (1N) for relays 1 4
	13, 14, 15, 16	0V (2N) for relays 5 8
	17/18	0V/Reference potential for relay outputs
4	1...18	Protective earth (PE)

170 ARM 370 30 terminal block labeling:

Connectors	Terminal Number	Meaning
1	1...10	Inputs
	11, 12	Input power supply (L+)
	13, 14	0V (M–) for inputs
	15, 16	Not used
	17	0V (M–) for the base
	18	Base power supply (L1) 120 VAC
2	1...8	Input power supply (L+)
	9...12	Output Group 1
	13...16	Output Group 2
	17	Relay output voltage (1L1, 20...115 VDC or 24...230 VAC
	18	Relay output voltage (2L1, 20...115 VDC or 24...230 VAC

Connectors	Terminal Number	Meaning
3	1...8	0V (M–) for inputs
	9, 10, 11, 12	0V (1N) for relays
	13, 14, 15, 16	0V (2N) for relays
	17/18	0V/Reference potential for relay outputs

List of Momentums with 10 inputs and 8 outputs (10 discrete inputs in 1 group and 8 triac outputs in 1 group (1 fuse for 4 outputs)):

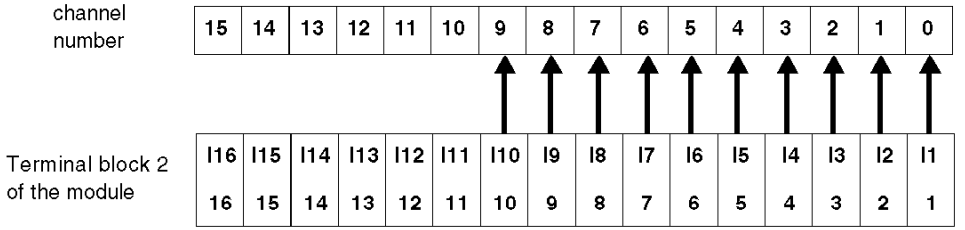
- **170 ADM 690 50**
- **170 ADM 690 51**

Outputs are connected to base terminal block 2, and inputs to terminal block 1.

Input channel image accessible via:

%I\2.e\0.0.c

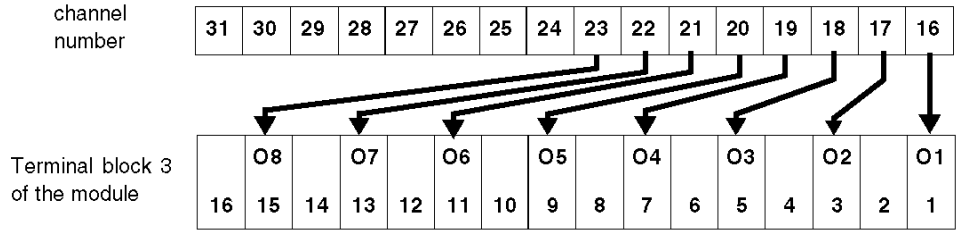
Inputs:



Output channel image sent to the communicator via:

%Q\2.e\0.0.c

Outputs:



Terminal block labeling:

Connectors	Terminal Number	Meaning
1	Fuse 1, Fuse 2	Internal fuses for output power supply
2	1...10	Inputs
	11...14	Connected internally, directly on the connector. Connection order is not pre-determined.
	15...16	0V (N) for sensors
	17	0V (N)
	18	120 VAC power supply (L1)
3	1, 3, 5, 7, 9, 11, 13, 15	Outputs
	2, 4, 6, 8, 10, 12, 14, 16	0V (1N) for actuators
	17	0V for outputs
	18	20 ... 132 VAC power supply for outputs 1 8 (1L1)
4	1...18	120 VAC input power supply (2L1)
5	1...18	0V (2N) for sensors
6	1...18	Protective earth (PE)

Section 8.2
Addressing Advanced Momentum Modules

Aim of this Section

This section provides information about the configuration of analog inputs/outputs (or assimilated) Momentum modules on Fipio.

What Is in This Section?

This section contains the following topics:

Module 170 AAI 140 00

Input Values

The module has 16 analog inputs.

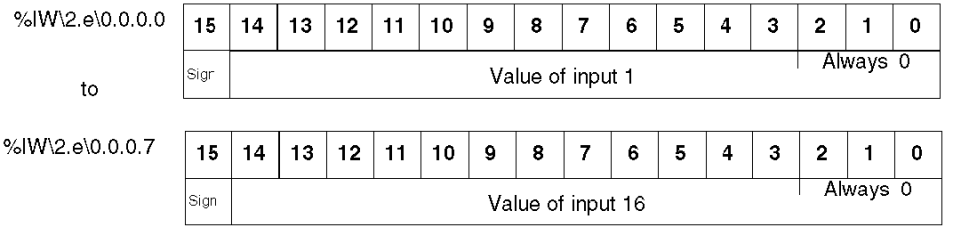
At input, the analog values are read in one word per channel. Therefore, the **170 AAI 140 00** base uses 16 contiguous words. The sign is always assigned to bit 15 of the word.

The value is justified to the left.

The representation format is 2's complement binary.

The numerical analog conversion is done on 12 bits + polarity sign (bipolar ranges).

Bits 2 ... 0 are unused and always set to 0. The result of this is that the read value will be modified in increments of 8 units.



Parameters

These parameters are sent to the module via the communicator, in the form of words for configuring the input functioning mode. Each 4-bit byte of a word corresponds to an analog channel.

The order of the 4-bit bytes is as follows:

The value of each 4-bit byte is coded according to the following rules:

Value of the 4-Bit Byte (in Binary)	Value in Hexadecimal	Meaning
2#0000	0	reserved
2#1010	A	+/-5 VDC
2#1011	B	+/-10 VDC
2#1100	C	channel inactive
2#1110	E	4...20 mA

NOTE: Any parameter value not indicated in the table above is not permitted. The module continues to work with the last valid parameters it received.

Module 170 AAI 030 00

Input Values

The module has 8 analog inputs.

At input, the analog values are read in one word per channel. Therefore, the **170 AAI 030 00** base uses 8 contiguous words. The sign is always assigned to bit 15 of the word.

The value is justified to the left.

The representation format is 2's complement binary.

The numerical analog conversion is done on 12 bits + polarity sign.

Bits 2 ... 0 are unused and always set to 0. The result of this is that the read value will be modified in increments of 8 units.

%IW\2.e\0.0.0.0

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Sign	Value of input 1												Always 0		

to

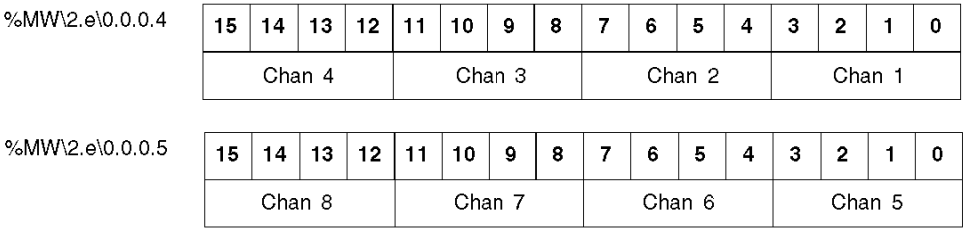
%IW\2.e\0.0.0.7

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Sign	Value of input 8												Always 0		

Parameters

These parameters are sent to the module via the communicator, in the form of words for configuring the input functioning mode. Each 4-bit byte of a word corresponds to an analog channel.

The order of the 4-bit bytes is as follows:



The value of each 4-bit byte is coded according to the following rules:

Value of the 4-Bit Byte (in Binary)	Value in Hexadecimal	Meaning
2#0000	0	reserved
2#0010	2	+/-5 VDC and +/-20 mA
2#0011	3	+/-10 VDC
2#0100	4	channel inactive
2#1001	9	1...5 VDC and 4...20 mA

NOTE: Any parameter value not indicated in the table above is not permitted. The module continues to work with the last valid parameters it received.

Module 170 AAI 520 40

Input Values

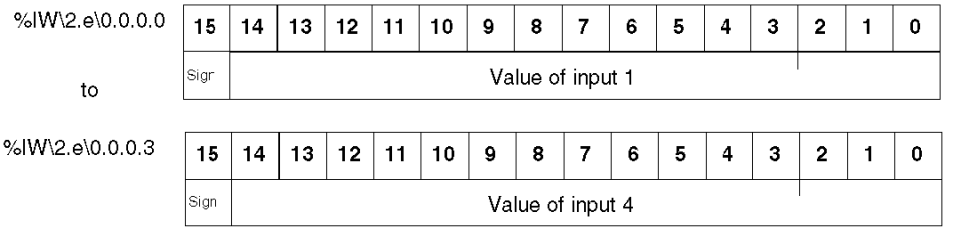
The module has four analog inputs TS, TC, Mv.

At input, the analog values are read in one word per channel. Therefore, the **170 AAI 520 40** base uses four contiguous words. The sign is always assigned to bit 15 of the word.

The value is justified to the left.

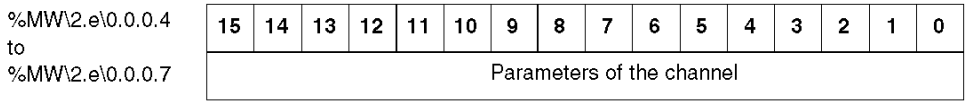
The representation format is 2's complement binary.

The numerical analog conversion is done on 15 bits + polarity sign.



Parameters

These parameters are sent to the module via the communicator, in the form of words for configuring the input functioning mode. The parameter corresponds: to the type of sensor, the choice of temperature unit, the necessity of a wiring check.



Thermocouple ranges:

Range	Temperature	Wiring Check	Parameter Word (Hex)
Thermocouple B	1/10 degrees C	inactive	2201
		active	2301
	1/10 degrees F	inactive	2281
		active	2381

Range	Temperature	Wiring Check	Parameter Word (Hex)
Thermocouple E	1/10 degrees C	inactive	1202
		active	1302
	1/10 degrees F	inactive	1282
		active	1382
Thermocouple J	1/10 degrees C	inactive	1203
		active	1303
	1/10 degrees F	inactive	1283
		active	1383
Thermocouple K	1/10 degrees C	inactive	1204
		active	1304
	1/10 degrees F	inactive	1284
		active	1384
Thermocouple N	1/10 degrees C	inactive	1205
		active	1305
	1/10 degrees F	inactive	1285
		active	1385
Thermocouple R	1/10 degrees C	inactive	2206
		active	2306
	1/10 degrees F	inactive	2286
		active	2386
Thermocouple S	1/10 degrees C	inactive	2207
		active	2307
	1/10 degrees F	inactive	2287
		active	2387
Thermocouple T	1/10 degrees C	inactive	2208
		active	2308
	1/10 degrees F	inactive	2288
		active	2388

Ranges PT100, PT1000, Ni 100 and Ni 1000:

Range	Wiring	Temperature	Wiring Check	Parameter Word (Hex)
IEC PT100 RTD	2 or 4 wires	1/10 degrees C	inactive	0A20
			active	0B20
		1/10 degrees F	inactive	0AA0
			active	0BA0
	3 wires	1/10 degrees C	inactive	0E20
			active	0F20
		1/10 degrees F	inactive	0221
			active	0321
IEC PT1000 RTD	2 or 4 wires	1/10 degrees C	inactive	0221
			active	0321
		1/10 degrees F	inactive	02A1
			active	03A1
	3 wires	1/10 degrees C	inactive	0621
			active	0721
		1/10 degrees F	inactive	06A1
			active	07A1
US/JIS PT100 RTD	2 or 4 wires	1/10 degrees C	inactive	0A60
			active	0B60
		1/10 degrees F	inactive	0AE0
			active	0BE0
	3 wires	1/10 degrees C	inactive	0E60
			active	0F60
		1/10 degrees F	inactive	0EE0
			active	0FE0
US/JIS PT1000 RTD	2 or 4 wires	1/10 degrees C	inactive	0261
			active	0361
		1/10 degrees F	inactive	02E1
			active	03E1
	3 wires	1/10 degrees C	inactive	0661
			active	0761
		1/10 degrees F	inactive	06E1
			active	07E1

Range	Wiring	Temperature	Wiring Check	Parameter Word (Hex)
DIN Ni 100 RTD	2 or 4 wires	1/10 degrees C	inactive	0A23
			active	0B23
		1/10 degrees F	inactive	0AA3
			active	0BA3
	3 wires	1/10 degrees C	inactive	0E23
			active	0F23
		1/10 degrees F	inactive	0EA3
			active	0FA3
DIN Ni 1000 RTD	2 or 4 wires	1/10 degrees C	inactive	0222
			active	0322
		1/10 degrees F	inactive	02A2
			active	03A2
	3 wires	1/10 degrees C	inactive	0622
			active	0722
		1/10 degrees F	inactive	06A2
			active	07A2

Voltage ranges:

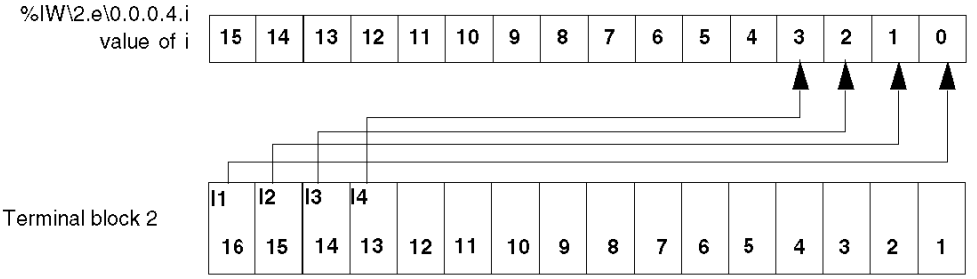
Range	Wiring Check	Parameter Word (Hex)
+/-25mV	inactive	2210
	active	2310
+/-100mV	active	1211
	inactive	1311

Module 170 AMM 090 00

Discrete Inputs

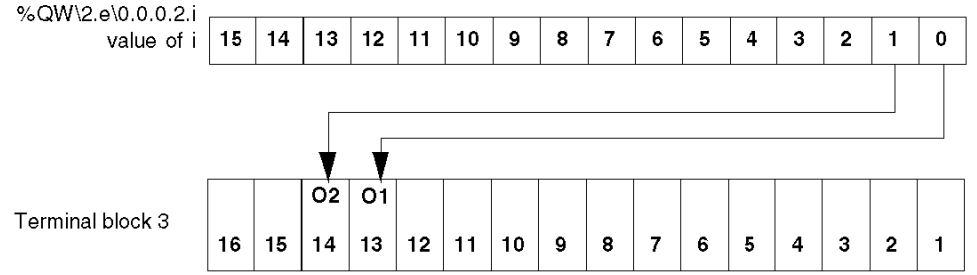
This mixed module has four analog inputs and two analog outputs, as well as four discrete inputs and two discrete outputs.

The **170 AMM 090 00** base sends four discrete input bits (and any detected fault messages) in a 16 bit word to the master. Inputs are connected to terminal block 2 on the base.



Discrete Outputs

The master sends 2 discrete outputs bits to the base in a unique 16 bit word. The outputs are connected to terminal block 3.



Analog Input Values

At input, the analog values are read in one word per channel. The **170 AMM 090 00** base uses 4 contiguous words. The sign is always assigned to bit 15 of the word.

The value is justified to the left.

The representation format is 2's complement binary.

The numerical analog conversion is done on 12 bits + polarity sign (for bipolar ranges).

Bits 2 ... 0 are unused and always set to 0. The result of this is that the read value will be modified in increments of 8 units.

%IW\2.e\0.0.0.0

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Sign	Value of input 1												Always 0		

to

%IW\2.e\0.0.0.3

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Sign	Value of input 4												Always 0		

Analog Output Values

Analog output values are written in one word per channel. The base uses 2 contiguous words.

The format is identical to analog inputs.

%QW\2.e\0.0.0.0

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Sign	Value of output 1												Always 0		

to

%QW\2.e\0.0.0.1

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Sign	Value of output 2												Always 0		

Configuration Parameters for Analog Inputs

These parameters are sent to the module via the communicator, in the form of words for configuring the input functioning mode. Each 4 bit byte of a word corresponds to an analog channel.

The order of the 4-bit bytes is as follows:

%MW\2.e\0.0.4

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Chan 4				Chan 3				Chan 2				Chan 1			

The value of each 4-bit byte is coded according to the following rules:

Value of the 4-Bit Byte (in Binary)	Value in Hexadecimal	Meaning
2#0000	0	reserved
2#0010	2	+/-5 VDC or +/- 20 mA
2#0011	3	+/-10 VDC
2#0100	4	channel inactive
2#1010	A	1...5V or 4...20 mA

Configurations of Fallback Values for Analog Outputs

These parameters are sent to the module via the communicator, in the form of words for configuring the output functioning mode. Every 4 bit byte of this word corresponds to an analog channel.

The order of the 4-bit bytes is as follows:

%MW\2.e\0.0.0.5

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Reserved				Reserved				Chan 2				Chan 1			

The value of each 4-bit byte is coded according to the following rules:

Value of the 4-Bit Byte (in Binary)	Value in Hexadecimal	Meaning
2#0000	0	reserved
2#00x1	1 or 3	output configured to zero by default: sends a value to the base, obliging it to force the actuators to zero (0 V or 0 mA).
2#01x1	5 or 7	output configured in the middle of the scale by default: sends a value to the base, obliging it to force the actuators to the value in the middle of the scale (+10 V or +20 mA).
2#10x1	9 or B	output configured to the last value displayed by default
x is equal to 0 or 1 indiscriminately		

NOTE: Any parameter value not indicated in the tables above is not permitted. The module continues to work with the last valid parameters it received.

Module 170 AAO 120 00

Output Values

This module has 4 0-20 mA analog outputs.

Analog output values are written in one word per channel. Therefore, the **170 AAO 120 00** base uses 4 contiguous words. The sign is always assigned to bit 15 of the word.

The value is justified to the left.

The representation format is 2's complement binary.

The numerical analog conversion is done on 12 bits + polarity sign (in +/-10 V).

Bits 2 ... 0 are unused and always set to 0. The result of this is that the read value will be modified in increments of 8 units.

%QW\2.e\0.0.0.0

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Sign	Value of output 1												Always 0		

to

%QW\2.e\0.0.0.3

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Sign	Value of output 4												Always 0		

Configuration of Fallback Values for Analog Outputs

These parameters are sent to the module via the communicator, in the form of words for configuring the output functioning mode. Every 4 bit byte of this word corresponds to an analog channel.

The order of the 4-bit bytes is as follows:

%MW\2.e\0.0.4

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Chan 4				Chan 3				Chan 2				Chan 1			

The value of each 4-bit byte is coded according to the following rules:

Value of the 4-Bit Byte (in Binary)	Value in Hexadecimal	Meaning
2#0000	0	reserved
2#00x1	1 or 3	Output configured to zero by default: sends a value to the base, obliging it to force the actuators to zero (0 V or 0 mA).
2#01x1	5 or 7	Output configured in the middle of the scale by default: sends a value to the base, obliging it to force the actuators to the value in the middle of the scale (+10 V or +20 mA).
2#10x1	9 or B	Output configured to the last value displayed by default
x is equal to 0 or 1 indiscriminately		

NOTE: Any parameter value not indicated in the table above is not permitted. The module continues to work with the last valid parameters it received.

Module 170 AAO 921 00

Output Values

This module has four 4-20 mA or 0-10 V analog outputs.

Analog output values are written in one word per channel. Therefore, the **170 AAO 921 00** base uses 4 contiguous words. The sign is always assigned to bit 15 of the word.

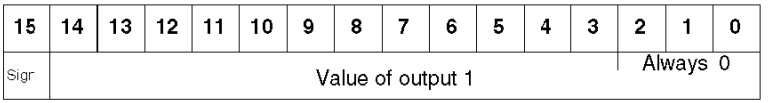
The value is justified to the left.

The representation format is 2's complement binary.

The numerical analog conversion is done on 12 bits + polarity sign (in +/-10v).

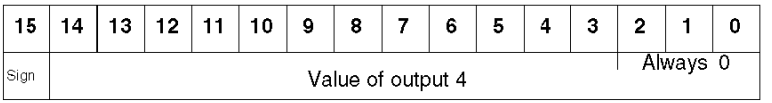
Bits 2 ... 0 are unused and always set to 0. The result of this is that the read value will be modified in increments of 8 units.

%QW\2.e\0.0.0.0



to

%QW\2.e\0.0.0.3



Configuration of Fallback Values

These parameters are sent to the module via the communicator, in the form of words for configuring the output functioning mode. Every 4 bit byte of this word corresponds to an analog channel.

The order of the 4-bit bytes is as follows:

%MW\2.e\0.0.0.4

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Chan 4				Chan 3				Chan 2				Chan 1			

The value of each 4-bit byte is coded according to the following rules:

Value of the 4-Bit Byte (in Binary)	Value in Hexadecimal	Meaning
2#0000	0	reserved
2#00x1	1 or 3	output configured to zero by default: sends a value to the base, obliging it to force the actuators to zero (0 V or 4 mA)
2#01x1	5 or 7	output configured in the middle of the scale by default: sends a value to the base, obliging it to force the actuators to the value in the middle of the scale (+10 V or +20 mA)
2#10x1	9 or B	output configured to the last value displayed by default
x is equal to 0 or 1 indiscriminately		

NOTE: Any parameter value not indicated in the table above is not permitted. The module continues to work with the last valid parameters it received.

Section 8.3
Addressing Mixed Modules

Aim of this Section

This section provides information about the configuration of the 170 ANR 120 90 and 170 ANR 120 91 discrete and analog input/output Momentum modules on Fipio.

The Momentum 170 ANR 120 90 and 170 ANR 120 91 bases support the following inputs and outputs:

- six analog input channels
- four analog output channels
- eight discrete inputs
- eight discrete outputs

Full operation for the module is described in the base setup documentation **870 USE 002**.

What Is in This Section?

This section contains the following topics:

170 ANR 120 9x Module: Input words

Input Words

Input Words	Function
%IW\2.e\ 0.0.0.11	status word of the module
%IW\2.e\ 0.0.0.0	status of the eight discrete inputs
%IW\2.e\ 0.0.0.1	analog value of channel 1, terminal block 2 No. 10
%IW\2.e\ 0.0.0.2	analog value of channel 2, terminal block 2 No. 11
%IW\2.e\ 0.0.0.3	analog value of channel 3, terminal block 2 No. 12
%IW\2.e\ 0.0.0.4	analog value of channel 4, terminal block 2 No. 14
%IW\2.e\ 0.0.0.5	analog value of channel 5, terminal block 2 No. 15
%IW\2.e\ 0.0.0.6	analog value of channel 6, terminal block 2 No. 16
%IW\2.e\ 0.0.0.7 to %IW\2.e\ 0.0.0.10	not used

e Fipio connection point number.

Description of Input Word 11

The status word contains information about module operation:

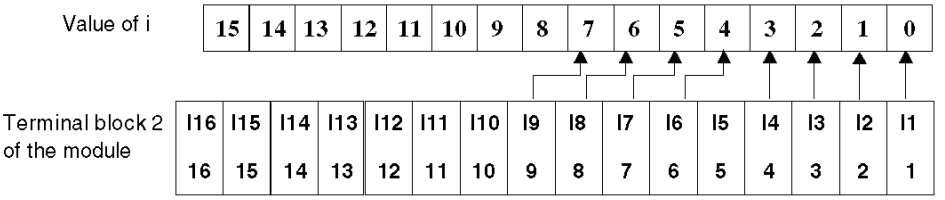
Bits 15 to 9	Bit 8	Bits 7 to 4	Bit 3 (Channels 7, 8)
Not used	0 = module not healthy (loss of module data) 1 = healthy module	Not used	0 = fault 1 = no fault

Bit 2 (Channels 5, 6)	Bit 1 (Channels 4, 3)	Bit 0 (Channels 1, 2)
0 = fault 1 = no fault	0 = fault 1 = no fault	0 = fault 1 = no fault

Description of Input Word 0

This word contains a right justified binary eight bit data field for the 8 discrete inputs:

%IW\2.e\ 0.0.0.0.i



Description of Input Words 1 to 6

These words are assigned to the analog input register. Each word on this page contains a left justified, binary 15 bit data field. The range is from 0H to 7 FFE hex, but the resolution is 14 bit (0 32766 decimal or 0 to 7 FFE hex).

Range

Analog output operating range:

	Input Voltage	Data is Left Justified	Comment
Input range	- 10,000 to + 10,000	00382 to 32382	Nominal input voltage range
Input over range	+10,000 to +10,238	32384 to 32764	Linear over range input voltage
Input out of range	≥10,238	32766 (7FFE hexadecimal)	Input voltage exceeding the threshold may damage the module.
Input under range	-10,238 to -10,000	00002 to 00382	Linear undervoltage range
Input out of range	≤10,238	00000	Input voltage exceeding the threshold may damage the module.

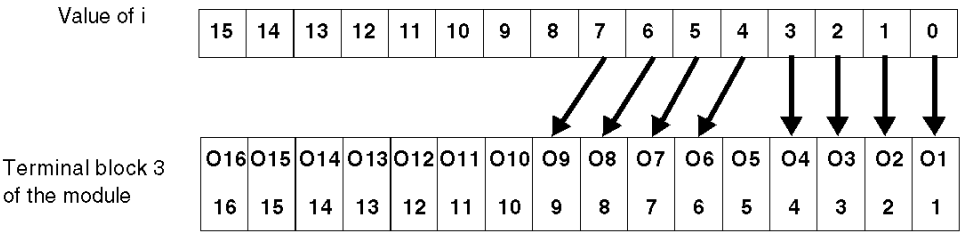
170 ANR 120 9x Module: Output words

Output Words

The I/O registers assigned to these modules are used for output data as follows:

Word	Function
%QW\2.e\0.0.0.0	write to 8 discrete outputs
%QW\2.e\0.0.0.1	analog output word for channel 1, terminal block 3 No. 10
%QW\2.e\0.0.0.2	analog output word for channel 2, terminal block 3 No. 12
%QW\2.e\0.0.0.3	analog output word for channel 3, terminal block 3 No. 14
%QW\2.e\0.0.0.4	analog output word for channel 4, terminal block 3 No. 16

%QW\2.e\0.0.0.0.i



Range

Analog output operating range:

	Output Voltage	Data is Left Justified	Comment
Output range	- 10.000 to + 10.000	00382 to 32382	Nominal output voltage range
Output over range	+10.000 to +10.238	32384 to 32764	Linear over range output voltage
Output out of range	≥10.238	32766 (7FFE hexadecimal)	Threshold will be limited to 32.766 decimal
Output under range	-10.238 to –10.000	00002 to 00382	Linear undervoltage range
Output out of range	≤10.238	00000	Threshold limited to 00000.

170 ANR 120 9x Module: Configuration words

Register of Internal Words

Configuration of the modules is carried out on the internal words %MW\2.e\ 0.0.0.20 to %MW\2.e\ 0.0.0.26 as shown in the table below:

Word	Function
%MW\2.e\ 0.0.0.20	system information
%MW\2.e\ 0.0.0.21	configuration of discrete fallback values
%MW\2.e\ 0.0.0.22	configuration of analog fallback values
%MW\2.e\ 0.0.0.23	user defined analog fallback values for channel 1
%MW\2.e\ 0.0.0.24	user defined analog fallback values for channel 2
%MW\2.e\ 0.0.0.25	user defined analog fallback values for channel 3
%MW\2.e\ 0.0.0.26	user defined analog fallback values for channel 4

e = Fipio connection point number

Description of Word 20

⚠ WARNING

UNEXPECTED OUTPUTS FALLBACK

Zero is an illegal value for the system information register.

Entering a value of 0 in word 20 triggers output fallback. In this case; inputs and outputs are not updated.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Word	Description
Bits 0 14	not used or that can be used to start the module (LED READY lit, if the value entered exceeds 0).
Bit 15	1 = validates use of fallback values. 0= no fallback value.

- In word 20, the authorized value range is: 0001 to FFFF.
  For proper operation of the module, it is mandatory to configure a value greater than 0 in the register.
- The register default value at power up is 0 (module stopped).

Description of Word 21

Configuration of discrete output fallback values:

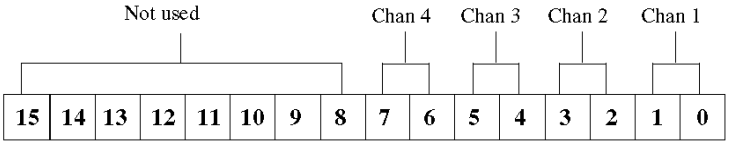
Word	Description
Bits 0 7	fallback value for discrete outputs 1 to 8
Bits 8 13	not used
Bit 14	0 = hold last value, 1 = user-defined value
Bit 15	0 = reset outputs, 1 = check bit 14

Description of Word 22

Words 22 to 26 are used to define analog output fallback values.

2 bits per channel to configure fallback management:

Word	Error Status
00	minimum output voltage
01	hold last value (by default)
10	user defined shutdown value
11	hold last value



Descriptions of Words 22 to 26

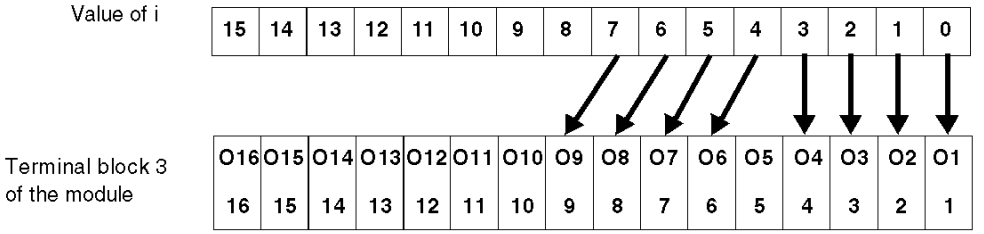
Used if the combination 10 is defined in word 22. They then contain the fallback value.

Output Words

The I/O registers assigned to this module are used for output data as follows:

Word	Function
%QW\2.e\ 0.0.0.0	write to 8 discrete outputs
%QW\2.e\ 0.0.0.1	analog output word for channel 1, terminal block 3 No. 10
%QW\2.e\ 0.0.0.2	analog output word for channel 2, terminal block 3 No. 12
%QW\2.e\ 0.0.0.3	analog output word for channel 3, terminal block 3 No. 14
%QW\2.e\ 0.0.0.4	analog output word for channel 4, terminal block 3 No. 16

%QW\2.e\ 0.0.0.0.i



Range

Analog output operating range:

	Output Voltage	Data is Left Justified	Comment
Output range	- 10.000 to + 10.000	00382 to 32382	Nominal output voltage range
Output over range	+10.000 to +10.238	32384 to 32764	Linear over range output voltage
Output out of range	≥10.238	32766 (7FFE hexadecimal)	Threshold will be limited to 32.766 decimal
Output under range	-10.238 to –10.000	00002 to 00382	Linear undervoltage range
Output out of range	≤10.238	00000	Threshold limited to 00000.

Section 8.4
Addressing a Special Module: 170 AEC 920 00

Aim of this Section

This section provides information about the configuration of the 170 AEC 920 00 discrete inputs/outputs Momentum module on Fipio.

Full operation for the module is described in the base setup documentation (870 USE 002).

What Is in This Section?

This section contains the following topics:

Example of Module Configuration in Unity Pro

At a Glance

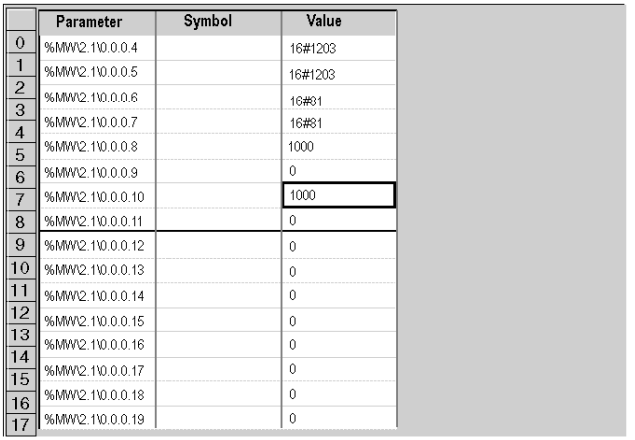
This module is a counting module with 2 independent high-frequency counters (10 kHz - 200 kHz).

The following example allows you to configure and program a Momentum 170 AEC 920 00 on FIPIO in Unity Pro.

Configuration

The following table shows the procedure for entering the adjustment parameters.

Step	Action
1	Insert module *(see page 36)* **170 AEC 920 00**.
2	Select the **Adjust** tab.
3	Enter the configuration parameters of the counting functions. The diagram below shows the **Adjust** tab with the parameter values:



	Parameter	Symbol	Value
0	%MW\2.1\0.0.0.4		16#1203
1	%MW\2.1\0.0.0.5		16#1203
2	%MW\2.1\0.0.0.6		16#81
3	%MW\2.1\0.0.0.7		16#81
4	%MW\2.1\0.0.0.8		1000
5	%MW\2.1\0.0.0.9		0
6	%MW\2.1\0.0.0.10		1000
7	%MW\2.1\0.0.0.11		0
8	%MW\2.1\0.0.0.12		0
9	%MW\2.1\0.0.0.13		0
10	%MW\2.1\0.0.0.14		0
11	%MW\2.1\0.0.0.15		0
12	%MW\2.1\0.0.0.16		0
13	%MW\2.1\0.0.0.17		0
14	%MW\2.1\0.0.0.18		0
15	%MW\2.1\0.0.0.19		0
16			
17			

Example of Counting Function Configuration

- In the parameter words %MW\2.e\0.0.0.4 and %MW\2.e\0.0.0.5 *(see page 135)*, enter the hex value: **16#1203**.
  Information:
  - Bit 0 "enable preset" = 1 (otherwise, the preset value is inactive)
  - Bit 1 "enable software" = 1 (otherwise the module is non-operational)
  - Bit 9 = 1
  - Bit 8, 10, 11 = 0, choice of operating mode: positive counter
  - Bit 12 = 1
  - Bit 13, 14 = 0, preset on rising edge of discrete inputs I1 and I4
- In the parameter words %MW\2.e\0.0.0.6 and %MW\2.e\0.0.0.7 *(see page 135)*, enter the hex value: **16#81**.
  Information:
  - Bit 0 = 1
  - Bit 1, 2, 3 = 0, identity code for a preset value
  - Bit 7 = 1, broken sensor monitoring activation bit
- In the parameter words %MW\2.e\0.0.0.8, %MW\2.e\0.0.0.9, %MW\2.e\0.0.0.10 and %MW\2.e\0.0.0.11 *(see page 135)*: preset value.

Minimum hardware setup required:

- 24 V on connectors 1 and 2
- Encoder supply on connector 3
- Encoders connected
- Actuators on discrete inputs 2 and 5 for external enabling of the counters (otherwise counting is blocked)
- Actuators on discrete inputs 1 and 4 for enabling preset values

Programming to take new preset into account:

Setting inputs 2 and 5 to 1 should allow you to see the counting progress in the input words %IW\2.1\0.0.0.4 to %IW\2.1\0.0.0.7.

During operation, preset values must be written in the output words %QW \2.1\0.0.0.0 to %QW\2.1\0.0.0.3, which are the images of output words 5 and 6 for counter 1,6 and 7 and for counter 2.

Counter 1 preset example:

```
(* preset value in %MW0 *)
IF %M1 THEN %QW\2.1\0.0.0.0 := %MW0;
(* write 0 on bits 0 and 1  output word 0 *)
    %MW\2.1\0.0.0.4:= 16#1200 ;
    WRITE_PARAM %CH\2.1\0.0.0 ;
    SET %M2 ;
    RESET %M1 ;
END_IF ;
(* write at 1 for the software enable and the preset bit *)
IF %M2 THEN %MW\2.1\0.0.0.4:=16#1203;
    WRITE_PARAM %CH\2.1\0.0.0;
    RESET %M2 ;
END_IF ;
```

Configuration of Counting Functions

Description

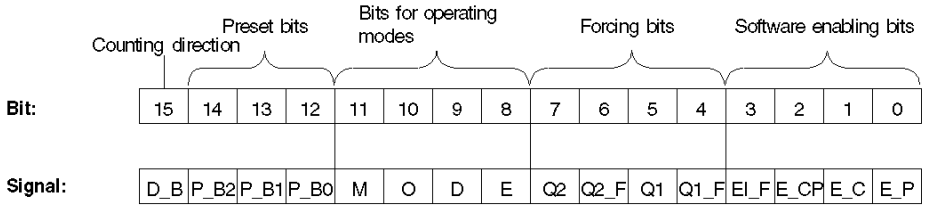
8 output words are available for configuring the two module counters for the **170 AEC 920 00** module.

Output Words	Function	PLC Designation
Word 1	Configuration bit for counter 1	%MW\2.e\0.0.0.4
Word 2	Configuration bit for counter 2	%MW\2.e\0.0.0.5
Word 3	Counter 1 output / setpoint data configuration	%MW\2.e\0.0.0.6
Word 4	Counter 2 output / setpoint data configuration	%MW\2.e\0.0.0.7
Word 5	Counter 1 setpoint data (Low)	%MW\2.e\0.0.0.8
Word 6	Counter 1 setpoint data (High)	%MW\2.e\0.0.0.9
Word 7	Counter 2 setpoint data (Low)	%MW\2.e\0.0.0.10
Word 8	Counter 2 setpoint data (High)	%MW\2.e\0.0.0.11

e = Fipio connection point number

Configuration Words 1 and 2

Illustration: %MW\2.e\0.0.0.4 and %MW\2.e\0.0.0.5



Meanings of signals:

Signal	Meaning
D_B	If bit 15 is placed by the software, the directions of the count are reversed in all operating modes.
P_B2	3 bits for selecting the preset mode
P_B1	
P_B0	
M	4 bits for selecting the operating modes
O	
D	
E	
Q2	Saving the valency for the Q2 digital output (forcing after 0 or 1)
Q2_F	Activation of forcing for Q2 digital output (1 = activated)
Q1	Saving the valency for the Q1 digital output (forcing after 0 or 1)
Q1_F	Activation of forcing for Q1 digital output (1 = activated)
EI_F	Enable input filter 0 = without filter (<= 200 kHz); 1 = with filter (<= 20 kHz)
E_CP	Software enable for the Freeze the value function
E_C	Software enable for counters
E_P	Software enable of the Reset to the preset value function

For SSI transmitters, the preset value and the software limit-switch values must be transmitted again after reversing the counting direction.

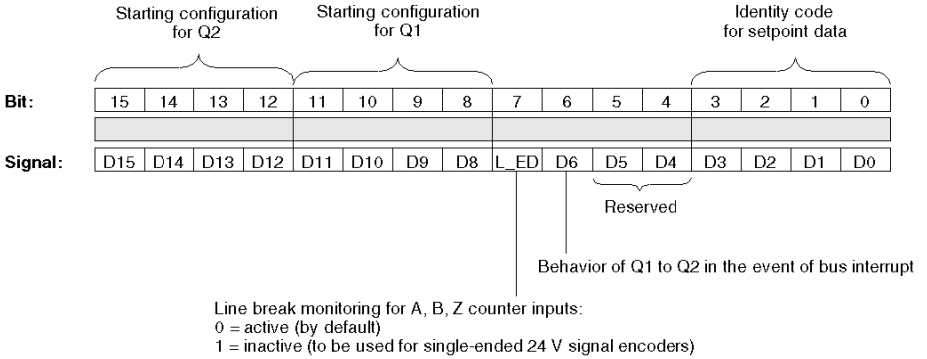
With output 2, the same functions are defined for counter 2 (however, for digital outputs, Q3 instead of Q1, and Q4 instead of Q2).

Configuration Word 3

Output word 3 allows the following functions for counter 1 to be defined:

- The meaning of parameters, which will be transmitted in words 5 and 6, is determined using the identity code for setpoint values (D0 ... D3).
- D4 and D5 are reserved
- D6, D7 module behavior in the event of bus interrupt and counter input line break
- Starting configuration of the Q1 digital output (D8 ...D11)
- Starting configuration of the Q2 digital output (D12 …) D15)

Illustration: %MW\2.e\0.0.0.6

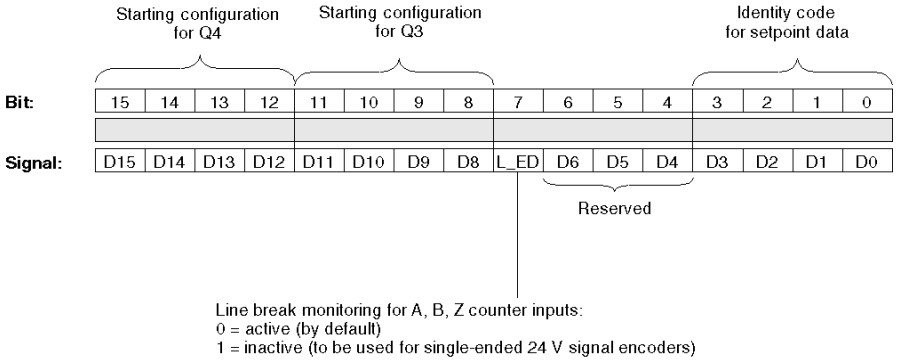


Configuration Word 4

Output word 4 allows the following functions for counter 2 to be defined:

- The meaning of parameters, which will be transmitted in words 7 and 8, is determined using the identity code for setpoint values (D0 ... D3).
- D4, D5, and D6 are reserved.
- D7 behavior of counter 2 in the event of break in the bus or counter input lines
- Configuration of the beginning of the Q3 digital output (D8 ...D11)
- Starting configuration of the Q4 digital output (D12 ... D15)

Illustration: %MW\2.e\0.0.7



Configuration Word 5,6 and 7,8

In the output words 5 and 6 (for counter 1), and 7 and 8 (for counter 2), the setpoint values are transmitted as 32-bit values, in accordance with the identity code defined in words 3 and 4 (counter 1: %MW\2.e\0.0.0.8 and %MW\2.e\0.0.0.9, counter 2: %MW\2.e\0.0.0.10 and %MW\2.e\0.0.0.11):

Identity Code	Function
Hex: 0	No setpoint value selected.
Hex: 1	Prefix value (24 bits + sign) or SSI Offset value (maximum transmitter resolution)
Hex: 2	Threshold value 1 (24 bits + sign for the incremental transmitter; 25 bits for the absolute transmitter)
Hex: 3	Threshold value 2 (24 bits + sign for the incremental transmitter; 25 bits for the absolute transmitter)
Hex: 4	Counter 1 software limit switch overrun (24 bits + sign for the incremental transmitter; 25 bits for the absolute transmitter)
Hex: 5	Counter 2 software limit switch underrun (24 bits + sign for the incremental transmitter; 25 bits for the absolute transmitter)
Hex: 6	Pulse width (in ms) for Q1/Q2 digital outputs (1 .. 2 (EXP 32)
Hex: 7	Modulo value for the event counter (repeating counter); the function can be deactivated using the modulo value= 0 (max. 24 bits)
Hex: 8	Time base for the "Period counter" operating mode (Operating mode 9) 0 = without time base: complete period: 1 = 1 , 2 = 10, 3 = 100, 4 = 1,000, 5 = 10,000 (in microseconds); half-period: 9 = 1 , A = 10 , B = 100 , C= 1,000 , D = 10,000 [microseconds] For transmission of all other values, the P_E bit s established and the 1F identity code is recalled.
Hex: 9	Time base for the "Frequency counter" operating mode (Operating mode A) 0 = without time base: complete period 1 = 0.1 , 2 = 1, 3 = 10, 4 = 100, 5 = 1,000 (in ms); half-period: 9 = 0.1, A = 1, B = 10, C= 100, D = 1 000 (in ms) For transmission of all other values, the P_E bit s established and the 1F identity code is recalled.
Hex: A	Selection of a complete period/half-period for time base pulse transmitter (Operating mode 8) (0 = not valid, PE–Bit is placed 1 = complete period, 2 = half-period at each Bx counting input)
Hex: B	Time base in ms for the frequencies output (1 .. 2 EXP 32) only for pulses on Q1/3 digital outputs (only for half periods)
Hex: C	reserved
Hex: D until hex: F	reserved values (correspond to identity code 0)

170 AEC 920 00 Module: Input Words

Input Words

8 input words are available for configuring the two module counters for the **170 AEC 920 00** module.

View of input word functions:

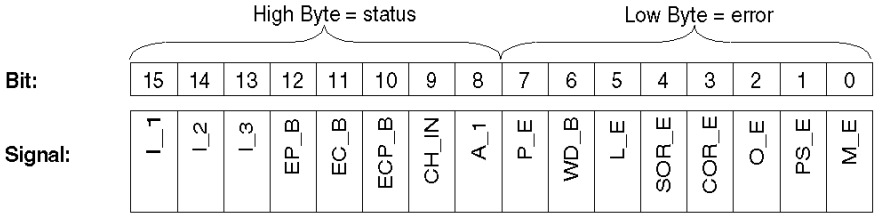
Output Words	Function	PLC Designation
Word 1	Status and error bit for counter 1	%IW\2.e\0.0.0.0
Word 2	Status and error bit for counter 2	%IW\2.e\0.0.0.1
Word 3	Counter 1 output configuration / setpoint data report	%IW\2.e\0.0.0.2
Word 4	Counter 2 output configuration / setpoint data report	%IW\2.e\0.0.0.3
Word 5	Count value (Low) of counter 1	%IW\2.e\0.0.0.4
Word 6	Count value (High) of counter 1	%IW\2.e\0.0.0.5
Word 7	Count value (Low) of counter 2	%IW\2.e\0.0.0.6
Word 8	Count value (High) of counter 2	%IW\2.e\0.0.0.7

e = Fipio connection point number

Input Words 1 and 2

The counter uses the status bits to transmit error messages as well as the hardware input states and the corresponding software enabling bits.

Illustration: %IW\2.e\0.0.0 and %IW\2.e\0.0.1:



Meanings of signals:

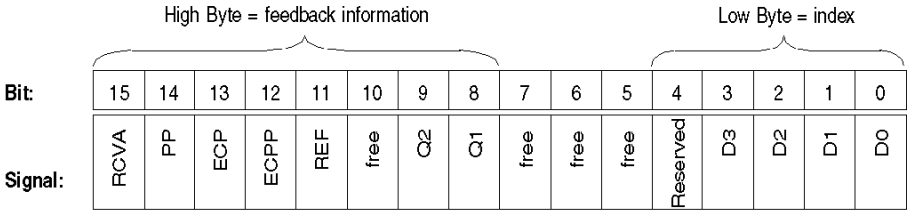
Signal	Meaning
I_1	Value of discrete input I1
I_2	Value of discrete input I2
I_3	Value of discrete input I3
EP_B	Software enable of the Reset to the preset value function
EC_B	Software enable of counter 1
ECP_B	Software enable for the Freeze the value of counter 1 function
CH_IN	Initialization of counter 1 is complete.
A_1	A1 counter input valency
P_E	Configuration error
WD_B	Time check error on absolute encoder
L_E	Counter input line break
SOR_E	Software limit switch overrun
COR_E	Counter overrun
O_E	Short circuit or overload for outputs Q1, Q2
PS_E	Power supply missing (outputs, transmitter)
M_E	The module has not been configured.

Input Words 3 and 4

In input words 3 and 4, the feedback on indices and the counter bit parameter states are transmitted to the API.

Input word 3 allows feedback to be transmitted for counter 1.

Illustration: %IW\2.e\0.0.0.2 and %IW\2.e\0.0.0.3:



Meanings of signals:

Signal	Meaning
RCVA	The counting cycle is finished.
PP	Preset value accepted.
ECP	The counter is enabled.
ECPP	The counting value is frozen.
REF	The preset value has been accepted for operating modes 4, 5.
free	free
Q2	Value of discrete output Q2
Q1	Discrete Q1 output value
free	free
free	free
free	free
Reserved	Reserved
D3	Feedback signal for indices transmitted (Handshake)
D2	
D1	
D0	

Input Words 5, 6 and 7, 8

Input words 5 and 6 (for counter 1) or 7 and 8 (for counter 2) contain the current values (actual data) of the encoder. In order to do this, two words (1 double word) are available for each counter.

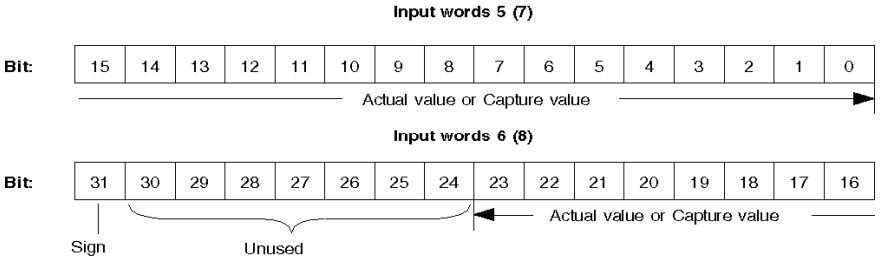
NOTE: The input words 5/6 or 7/8 transmit only the counters' actual values. Rereading of previously transmitted setpoint values is not possible.

Current Values for the Incremental Encoder

Resolution with/without sign:

- The respective resolution of the actual values is 24 bits plus sign (16 777 216 to +16 777 215).
- If a modulo value has been predefined, the maximum resolution is 24 bits without sign (0 to +16 777 215).

Representation of the actual value:

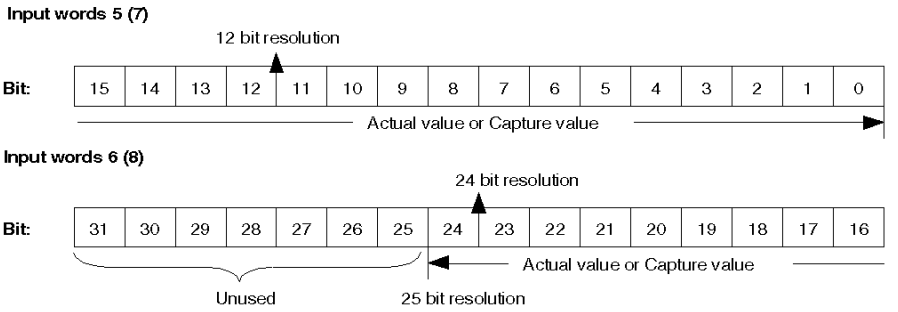


Current Values for the Absolute Encoder

For absolute encoders, feedback signaling of current values is permanent. The resolution is:

- 25 bits without sign, that is, from 0 to 33 554 431, for 25 pulses
- 24 bits without sign, that is, from 0 to 16 777 215, for 24 pulses
- 12 bits without sign, that is, from 0 to 4 095, for 12 pulses.

Representation of the input word for 12, 24 and 25 bits:



Chapter 9
Diagnostics for Momentum Modules

Aim of this Chapter

This chapter details the default Momentum behavior, when used on a Fipio bus controlled by a Premium PLC.

What Is in This Chapter?

This chapter contains the following topics:

Fault Behavior of Momentum Modules

At a Glance

The Module diagnostics function displays current errors, where these exist, classed according to their category:

- **Internal faults**:
  - module failures
  - self-tests running
- **External faults**:
  - terminal block fault
- **Other faults**:
  - configuration fault
  - module missing or off
  - faulty channel(s) *(see page 149)*

A module fault is indicated when certain LEDS change to red, such as:

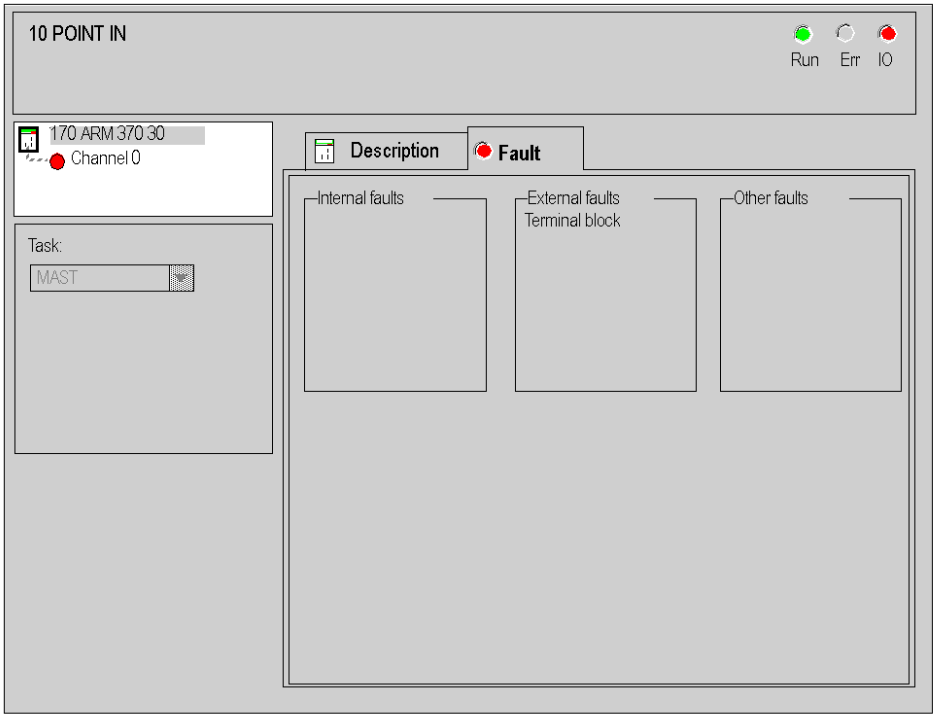
- In the Fipio bus window:
  - The connection point number of the module on the Fipio bus is red.
- In all screens at module level:
  - The **I/O** LED according to the type of fault
  - The **Channel** LED in the **Channel** field
- A red LED on the **Fault** tab

Module Diagnostics

Momentum modules have an error bit `%I\2.e\0.0.MOD.ERR` and a status word `%MW\2.e\0.0.MOD.2` that can be visualized using the Unity Pro software diagnostics screen. These language objects can also be accessed via the `T_GEN_MOD` IODDT associated with all modules.

Procedure

The following table shows the procedure for accessing the module fault screen.

Step	Action
1	Open the module on which you would like to perform diagnostics.
2	Click on the module reference in the channel zone and select the **Fault** tab. **Result:** The list of module faults appears.  **Note:** In the event of major failure, absence of the module, certain configuration faults, or a major configuration fault, access to the module diagnostics screen is not possible. The following message then appears on the screen: `The module is not present or different from the one configured in this position.`

Input and Output Values

The inputs and outputs of a Momentum module take different values depending on the nature of the fault encountered.

Input values and output states with faults:

Error	Input Value	Output State
Module missing or inoperative	All module inputs are at zero	No value has been applied.
Module different from the one configured	All module inputs are at zero.	No value has been applied.
Communication on Fipio bus interrupted	All module inputs are at zero.	No value has been applied.
(1) The behavior of faulty outputs depends on the type of Momentum base used. Only those connection bases with the capacity to signal errors on their outputs are able to manage the fallback to zero. Refer to the *Momentum I/O Base User Guide* (870 USE 002).		

Channel Fault Behavior of Momentum Modules

At a Glance

The channel diagnostics function displays current errors, where these exist, classed according to their category:

- **Internal faults:**
  - channel failure
- **External faults:**
  - terminal block fault
  - range overshoot or undershoot fault
- **Other errors:**
  - terminal block fault
  - configuration fault
  - communication fault
  - values outside limits

A channel error appears in the **Debug** tab when the  LED, located in the **Fault** column, turns red.

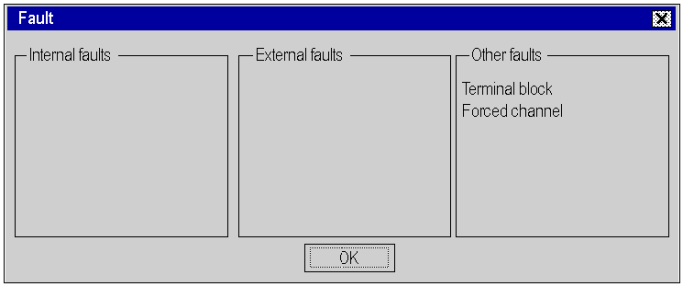
Channel Diagnostics

Momentum channels have an error bit `%I\2.e\0.0.c.ERR` and a status word `%MW\2.e\0.0.0.2` that can be visualized using the Unity Pro software diagnostics screen. These language objects can also be accessed via the IODDTs *(see page 59)* associated with the Momentum modules.

NOTE: For the 170 ADO 350 00 module, the fault bits cannot be accessed by Unity Pro.

Procedure

The following table shows the procedure for accessing the channel fault screen.

Step	Action
1	Access the module debug screen.
2	For the faulty channel, click the button  situated in the **Fault** column. **Result**: The list of channel faults appears.  **Note:** Channel diagnostics information can also be accessed by program (`READ_STS` instruction).

Input and Output Values

The inputs and outputs of a Momentum module take different values depending on the nature of the fault encountered.

Input values and output states with faults:

Fault	Input Value	Output State
Fault on simple module	• The faulty channel(s) is(are) at zero. • The valid channels take the sensor value.	• The faulty channels fall back to zero or are maintained in their last valid state (3). • The values continue to be applied to the valid channels.
Adjustment parameter(s) invalid	Error code sent by the Momentum base. Always different from all possible normal input values. Non-faulty channels continue to work. (2)	• The faulty channels fall back to zero or are maintained in their last valid state (3). • The values continue to be applied to the valid channels.
Fault on advanced module	Error code sent by the Momentum base. Always different from all possible normal input values. Non-faulty channels continue to work. (2)	• The faulty channels fall back to zero or are maintained in their last valid state (3). • The values continue to be applied to the valid channels.
(2) This error code depends on the base's capacity to indicate faults on the peripherals. (3) The behavior of faulty outputs depends on the type of Momentum base used. Only those bases with the capacity to signal errors on their output *(see page 107)* are able to manage the fallback.		

Appendices

Appendix A
Implementing on Another Fip Bus

Aim of this Chapter

This chapter presents the information necessary for implementing the communicator on a Fip bus, other than Fipio.

What Is in This Chapter?

This chapter contains the following topics:

Standard Fipio Profiles

General

The **170 FNT 110 01** Fipio Momentum communicator conforms to one of the 3 standard Fipio profiles described in the **FCP DM FSDP V10E** documentation, in either class 1 or 2.

The following table details the profile adopted by the communicator according to the base selected:

	Base Examples	Profile	Class
Number of ≤2 input words and Number of ≤2 output words	170 ADI 350 00 170 ADI 340 00 170 ADO 350 00 170 ADO 340 00 170 ADM 350 10 170 ADM 690 50 170 ADM 390 30 170 ADM 370 10	FRD	1
2 < Number of input words ≤8 and 2 < Number of output words ≤8	170 AAI 030 00* 170 AAI 520 40* 170 AAO 120 00* 70 AAO 921 00* 170 AMM 090 00*	FSD	2
8 < Number of input words ≤32 and 8 < Number of output words ≤32	170 AAI 140 00*	FED	2

If the base does not have parameters, the communicator conforms to class 1.

If the base has parameters, the communicator conforms to class 2.

All Momentum modules are modular.

To understand the characteristics of the associated Fip variables and information on managing operating modes and diagnostics, refer to the **FCP DM FSDP V10E** standard profile documentation.

Information Specific to Momentum Modules

General

Certain information specific to the Momentum modules is necessary to complete the Fip variables.

Identification Variable

Since the Momentums are modular, their identification variable has the format described in the standard profiles documentation for modular devices.

Values to be completed for the Momentum modules:

Field	Value
Number of bytes contained	4Fh
Manufacturer's Name	"MODICON"
Model Name	"MOMENTUM"
Product Version	10h (for 1.0)
Communication class	00h (no X-Way messaging)
Base module, "version" field	10h (for 1.0)
Communication module, "version" field	10h (for 1.0)

Catalogue Reference and **ASCII Description** fields

NOTE: Contrary to the description in the Fipio standard profiles documentation, the "Catalogue Reference" field is not FFh for the Momentums. This field's value depends on the base which the communicator is connected to.

Values for basic Momentum modules:

ASCII Description	Catalogue Reference
170ADI35000	01h
170ADI34000	02h
170ADI54000	03h
170ADI74000	28h
170ADO35000	05h
170ADO34000	06h
170ADO53000	16h
170ADO54000	14h
170ADO73000	17h
170ADO74000	15h
170ADO83000	33h

ASCII Description	Catalogue Reference
170ADM35010/11/51	08h
170ADM85010	34h
170ADM69050/51	09h
170ADM39010	0Ch
170ADM39030	0Ah
170ADM37010	0Bh
170AAI03000	C0h
170AAI14000	C1h
170AAI52040	C2h
170AAO12000	C3h
170AAO92100	C4h
170ANR12090	E3h
170ANR12091	E6h
170AMM09000	E0h
170AEC92000	A0h
170ARM37030	18h

Value for the Fipio communicator:

ASCII Description	Catalogue Reference
170FNT11001	04h

Presence Variable

Values to be completed for the Momentum modules:

Field	Value
Length of identification variable	4Fh
BA Arbitrator function status	Since Momentum does not support the arbiter function of the bus, the significant 4 bit byte of this byte is therefore equal to 0.

Report Variable

The Momentums manage the counters 01h, 02h, 05h, 2Bh, 2Ch, 2Fh, 2Eh, 2Dh, 35h, 21h, 22h, 23h, 24h, 30h, 80h. The fields are in this order in the variable.

Value to be completed for the Momentum modules:

Field	Value
Number of byte contained	30h

LN_Uploading Variable

The Momentum promptness timer is equal to 256 ms.

Value to be completed for the Momentum modules:

Field	Value
Asynchronous promptness time out value	30h

FB_Configuration Variable

Configuration parameters

Class 2 Momentums do not manage the configuration data. Consequently the values of these words are ignored by class 2 Momentums.

In order to respect the control principle of the acceptance of the parameters sent by the FB_Configuration_Description variable, the bus manager should always put a zero value in these words because the FB_Configuration_Description variable is produced with parameter values with zero configuration.

Adjustment parameters

The class 2 Momentums manage the adjustment parameters. The values of adjustment parameters for each type of base are described in chapter 6 (see *Addressing Advanced Momentum Modules, page 107*).

The first word described corresponds to the word PRM0 of the FB_Configuration variable. Remember that these words are encoded according to Intel format (least significant first).

Example:

For the **170 AAI 030 00** communicator (8 analog inputs), the correspondence is as follows:

PRM0	%MW\2.e\0.0.0.4
PRM1	%MW\2.e\0.0.0.5

FB_Configuration_Description Variable

The class 2 Momentums start with a configuration in the EMPTY state. They must therefore be sent the valid values via the FB_Configuration variable before sending the START command via the FB_Control variable.

FB_Control Variable

Specific commands

Momentum conforming to the FED profile do not manage specific commands. Any received values will be ignored.

FB_Status Variable

Standard status

Description of Standard status field bits for Momentums:

Bit	Description	Comments
0	Serious but temporary fault, internal to base	When this bit is set, transitional disturbance affects the behavior of the base connected to the communicator (EMC disturbance for example). When this fault disappears, the device resumes normal operation.
1	Minor fault, external to the base	When this bit is set, an external fault is present on the base used. The nature of this fault depends on the base itself. It is therefore useful to refer to the documentation for the base in question to know what type of external fault can indicated in the application program by the I/O-Error signal for this type of base (short-circuit, etc.).
2	Not used	-
3	Not used	-
4	Internal module fault (breakdown)	-
5	Hardware configuration fault	-
6	Communication fault with PLC	-
7	Application fault (adjustment values refused)	-

Specific status

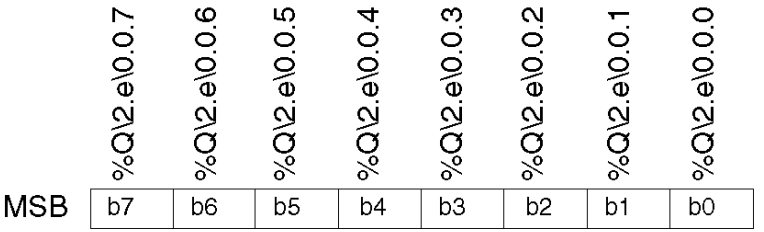
Momentums conforming to the FED profile do not manage status commands: the corresponding words are always zero.

Application_Process_Control Variable

Value of outputs

This variable contains information described in chapter 6 (see *Addressing Momentum Modules, page 85*) for the %QW\2.e\0.0.0.0 and subsequent words in the case of the FSD and FED profiles or %Q\2.e\0.0.0 and subsequent words in the case of the FRD profile.

Remember that the words are encoded according to Intel format (least significant first). For bits, the bit position is described in the standard profile documentation. For example, the first 8 output bits of a discrete module are located in the first byte in the following order:



Application_Process_Status Variable

Channel fault

The input values are only valid if this byte is zero.

Other possible values are:

Value	Meaning
FFh	The device is not configured (for a class 2 MOMENTUM)
01h	A minor external fault is present on the base (cf. FB_Status variable, Standard Status field)
02h	A serious temporary fault is present on the base. (cf. FB_Status variable, standard status field)

Value of inputs

This variable contains information described in chapter 6 (see *Addressing Momentum Modules, page 85*) for the %IW\2.e\0.0.0.0 and subsequent words in the case of the FSD and FED profiles or %I\2.e\0.0.0 and subsequent words in the case of the FRD profile.

Remember that the words are encoded according to Intel format (least significant first). For bits, the bit position is described in the Ref standard profile documentation. **FCP DM FSDP V10E**. See the paragraph relating to the Application_Process_Control variable for an example.

FB_adjustment Variable

See the FB_Configuration variable.

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