G5 flow computer products
μFLO^{G5} (microFLO^{G5})

Accurate, reliable, and with the capability to measure and monitor gas flow in compliance with AGA, API, and ISO standards

Introduction

This is a startup guide designed for typical installations only. Installations must be performed by personnel knowledgeable of the ABB Totalflow® μFLO^{G5} flow computer, the integral multivariable transducer (IMV), and the theory of natural gas electronic flow measurement. Installation personnel must also be knowledgeable of local and national codes as they apply to hazardous areas, communication wiring, and electrical wiring. Although there may be other methods of installation, it is recommended that technicians perform the guide procedures in the presented order.

⚠ **WARNING – Bodily injury.** The μFLO^{G5} flow computer startup guide does not address any requirements for the installation of product(s) in hazardous (classified) locations. Refer to the ABB installation drawing that is indicated on the unit's name plate, and local and national electrical codes for installation requirements in hazardous (classified) locations.

⚠ **WARNING – Bodily injury.** Read and follow instructions contained in this guide before and during equipment installation. Failure to do so could result in bodily injury or equipment damage. If there are questions that are not answered in this guide, or in the additional information section, please contact ABB. See *Contact us* section.

Cyber security

This product is designed to be connected, and communicate information and data, via a network interface, which should be connected to a secure network. It is the customer's sole responsibility to provide and continuously ensure a secure connection between the product and the customer network or any other network (as the case may be). The customer shall establish and maintain appropriate measures (such as, but not limited to, the installation of firewalls, application of authentication measures, encryption of data, installation of antivirus programs, etc.) to protect this product, the network, its system and interfaces against any kind of security breaches, unauthorized access, interference, intrusion, leakage and/or theft of data or information. ABB Inc. and its affiliates are not liable for damages and/or losses related to such security breaches, any unauthorized access, interference, intrusion, leakage and/or theft of data or information.

Although ABB provides functionality testing on the products and updates that it releases, the customer should institute its own testing program for any product updates or other major system updates (to include, but not limited to, code changes, configuration file changes, third party software updates or patches, hardware change out, etc.) to ensure that the security measures that the customer has implemented have not been compromised and that system functionality in the customer's environment is as expected.

Additional information

Additional free publications for the μFLO^{G5} are available for download at www.abb.com/totalflow.

μFLO^{G5} flow computer user manual	2105614
μFLO^{G5} flow computer data sheet	2102800
μFLO^{G5} (2104939 BD) wiring guide	2105507
μFLO^{G5} enclosure measurements	2105508
μFLO^{G5} I/O expansion board (2104395 BD) installation and wiring guide	2105506
μFLO^{G5} (2104939 BD) solar panel connection	2105509
NRTL/C (Class 1, Div 2) 60 °C	2015246
NRTL/C (Class 1, Div 2) 70 °C	2104615
ATEX Cert, EX II 3G, Ex nA IIB (Zone 2)	2104152
IECEx Cert, Ex nA IIB (Zone 2)	2100750

Assumptions

The following apply to this startup guide:

— Installation and maintenance will only be conducted by personnel authorized to work on electrical installations.
— Installation and maintenance will be conducted in accordance with relevant national and local codes.
— PCCU32 software version 7.58 (or later) is installed and operational on the laptop or personal computer used for setting up the μFLO^{G5}.
— The flow computer was designed to adapt to different scenarios, so installation can be adjusted according to specific site needs.

— This guide covers a standard configuration for a common site scenario. A standard configuration includes the flow computer mounting kit, a resistance temperature detector (RTD), and a solar panel with a mounting kit. If the standard configuration differs from the specific site needs, and is not addressed in this guide, see the user manual listed earlier in the *Additional information* section.

— Installation of the orifice plate, senior fitting, tap valves, or other peripheral equipment is outside the scope of this document.

1 Safety warning and note symbols

1.1 Safety conventions

The following conventions are used throughout this guide to bring attention to important information. The text may state the hazard, what to do or not do to avoid the hazard, and what the result would be if not followed.

DANGER – Serious damage to health / risk to life. This symbol, in conjunction with the signal word "DANGER", indicates an imminent danger. Failure to observe this safety information will result in death or severe injury.

WARNING – Bodily injury. This symbol, in conjunction with the signal word "WARNING", indicates a potentially dangerous situation. Failure to observe this safety information may result in death or severe injury.

WARNING – Bodily injury. This symbol, in conjunction with the signal word "WARNING", indicates a potential electrical hazard. Failure to observe this safety information will result in death or severe injury.

CAUTION – Property damage. This symbol, in conjunction with the signal word "CAUTION", indicates a potentially dangerous situation. Failure to observe this safety information may result in property damage. The symbol may also be used for minor injury warnings.

NOTICE – Property damage (and / or loss of data). This symbol, in conjunction with the signal word "NOTICE", indicates a potentially damaging situation. Failure to observe this safety information may result in damage to or destruction of the product and / or other system components including a possible loss of data.

IMPORTANT NOTE: This symbol indicates useful information, important information, or information to clarify a concept. The signal words "IMPORTANT NOTE" do not indicate a dangerous or harmful situation.

1.2   Potential safety hazards

The *µ*FLO^G5 equipment operates on 9 - 30 Vdc. However, optional equipment may convert power from Vac to Vdc. No hazardous voltages are present.

Pressurized natural gas is present in the measurement pipeline. Because of this, a possibility exists for natural gas to escape from the pipeline or tubing during installation or calibration, or following damage to the pipeline or tubing. Only properly trained and authorized personnel should work in hazardous locations.

Personal Protective Equipment (PPE) is not required for this equipment.

2   Unpack and inspect

The flow computer and optionally purchased parts are shipped separately in specially designed shipping cartons. Optional parts may include a mounting kit, an RTD, and a solar panel with mounting kit.

IMPORTANT NOTE: If there is any damage to the shipping carton, keep the carton and packing materials until the contents are inspected and found to be damage-free.

1. Inspect all of the shipping cartons for damage.
2. Carefully unpack and remove the items from each carton and inspect for damage:
    - The exterior of the flow computer
    - The LCD on the flow computer enclosure door
    - Optional equipment, if purchased
3. Claims for items damaged during shipment should be made directly with the common carrier.
4. Compare the packing list with the materials received. Check for missing or incorrect parts. Call the ABB office, listed under *Contact us* on the back cover of this guide if there are any problems.

IMPORTANT NOTE: Do not return equipment to ABB without prior written consent. Returns are subject to the terms and conditions specified by ABB.

3   Hardware installation

The *µ*FLO^G5 can be pipe-mounted, wall-mounted, or direct-mounted to the meter run:
— For pipe and wall mount installation instructions, see section 3.1.
— For direct mount installation, see section 3.2.

3.1   Pipe and wall mount installation
— For pipe mount installation instructions, see section 3.1.1.
— For wall mount installation instructions, see section 3.1.2.

3.1.1   Pipe mount installation

i **IMPORTANT NOTE:** Select a mounting location that allows for easy access, is close to the tap valves, and complies with all local and national codes.

Figure 1 displays the *µ*FLO^{G5} pipe-mounted to the meter run.
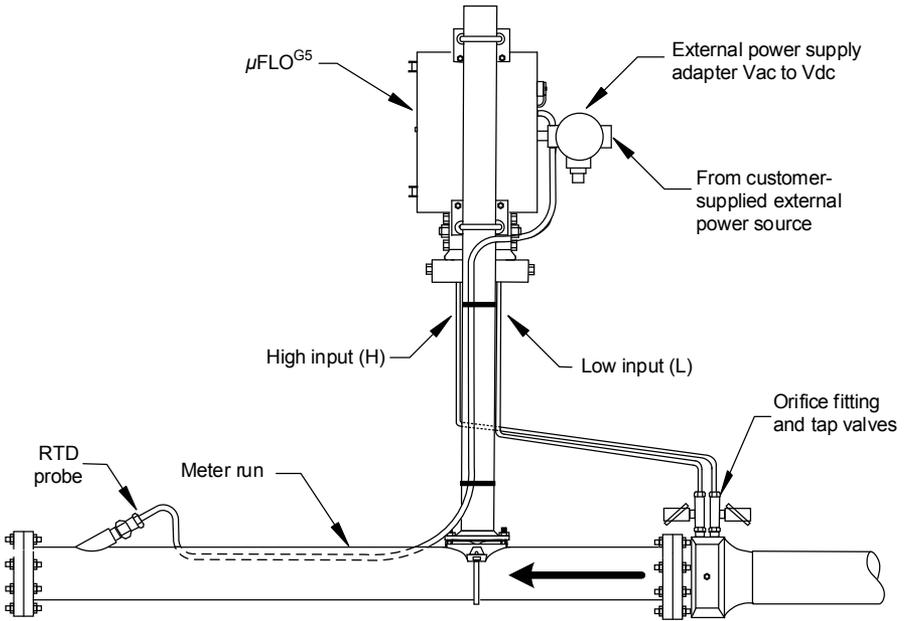
Figure 1: Typical pipe installation (for illustrative purposes only)

Materials:

— One (1) enclosure mounting kit (includes instructions, brackets, U-bolts and fastening hardware)
— One (1) pipe saddle with mounting hardware (size determined by technician)
— One (1) 2 inch x 40 inch pipe (length may be extended if mounting a solar panel)

To pipe-mount the flow computer:

1. Position the pipe saddle on the meter run and temporarily attach the saddle to the meter run pipe using the associated hardware (Figure 2).
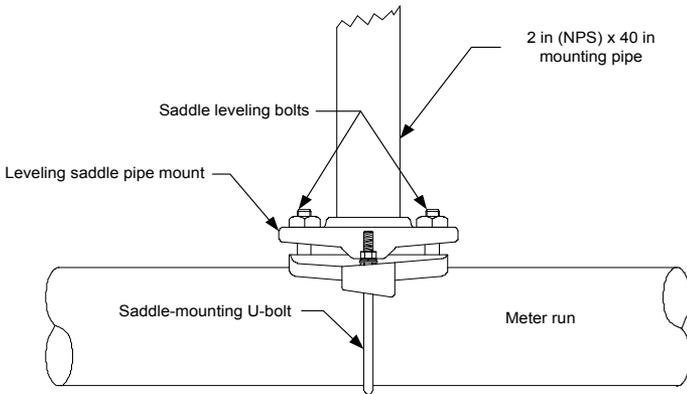
Figure 2: Mounting pipe positioned on meter run

2. Screw the mounting pipe into the saddle until it is tight.
3. Level the mounting pipe:
    a. Level the pipe and saddle so that the pipe is centered on the top of the meter run and tighten the saddle-mounting U-bolt.
    b. Level the pipe so that the pipe is perpendicular to the meter run using the saddle leveling bolts (if available) on the mounting saddle.
4. Finalize the saddle mount installation by tightening the saddle-mounting U-bolt as tight as possible to avoid vibration-related issues.
5. Install the flow computer mounting brackets to the back of the enclosure using the pipe mount instructions supplied in the mounting kit.
6. Attach the enclosure to the mounting pipe:
    a. Hold the enclosure in place against the mounting pipe and insert a U-bolt around the pipe and through the corresponding holes on the upper mounting bracket.
    b. Add the flat washer and split washer onto the U-bolt, then screw the nut onto the U-bolt.
    c. Repeat steps 6a and 6b for the second mounting bracket.
7. Raise the flow computer into position on the mounting pipe.

> **IMPORTANT NOTE:** Position the flow computer high enough to allow some downward slope from the externally mounted manifold to the tap valves.

8. Secure the flow computer in place by tightening the U-bolt nuts. Tighten the nuts to avoid vibration-related issues.

The flow computer is now pipe-mounted. To install the manifold and connect the input lines to the meter run, see section 3.1.3, *Manifold and input line installation*, page 8.

3.1.2   Wall mount installation

i **IMPORTANT NOTE:** Select a mounting location that allows for easy access, is close to the tap valves, and complies with all local and national codes.

The following steps detail the procedures for wall-mounting the flow computer by the meter run.

Materials:

— One (1) enclosure mounting kit (includes instructions, brackets, U-bolts and fastening hardware)
— Four (4) wall fasteners (length and girth determined by technician based on wall thickness and materials)

i **IMPORTANT NOTE:** The enclosure mounting kit contains more parts than needed for mounting the enclosure on a meter house wall.

1. Inspect the installation location to:
    a. Verify that the wall has sufficient strength to support the hanging weight of the unit, approximately 16 pounds (7.26 kg).
    b. Verify that there are no obstructions that would prevent opening the enclosure door.
    c. Verify that there are no obstacles that would prevent the solar panels, if installed, from charging during daylight hours.

! **NOTICE – Property damage.** Mounting the flow computer on a structure wall that lacks sufficient support may cause the mounting bolts to pull through the wall, allowing the flow computer to fall to the ground. Should the flow computer mounting bolts pull through the wall, the structure wall and flow computer would be damaged. Screw the mounting bolts into a wall stud or wall support of sufficient strength to support the weight of the flow computer.

2. Install the flow computer mounting brackets on the back of the enclosure using the pipe mount instructions supplied in the mounting kit.
3. Determine the appropriate mounting height for the flow computer to allow some downward slope from the IMV and manifold to the meter run tap valves.
4. Drill the upper mounting holes in the wall support.
5. Measure the distance between the top and bottom mounting bracket holes.
6. Locate and drill the lower mounting holes in the wall support.
7. Lift and align the enclosure on the wall so that the mounting bolt holes match the pre-drilled holes.
8. Insert the mounting bolts through the upper bracket holes and screw in the bolts until tight. Repeat this step for the lower bracket.

The flow computer is now wall-mounted. To install the manifold and connect the input lines to the meter run, see section 3.1.3, *Manifold and input line installation*.

3.1.3 Manifold and input line installation

The following procedure provides a generalized guideline to follow for the manifold and tubing installation.

Materials:

— Stainless steel tubing (length determined by technician)

— Four (4) sets of tube fittings, including ferrule and nut pairs

— One (1) manifold (3- or 5-valve manifold determined by technician)

To install the manifold and input lines:

1. Install the manifold on the flow computer IMV using the manufacturer's supplied instructions.

2. Locate the tap valves on the meter run orifice and the corresponding high and low inputs on the installed manifold.

3. Measure, cut, and bend the tubing to ease installation of the fittings into the orifice tap valves and the manifold.

4. Install the nut and ferrule onto the tubing end.

5. Insert the ferrule into the fitting and slide the nut onto the ferrule; engage the nut threads and tighten.

> **!** **NOTICE – Property damage.** To avoid damage to the stainless steel tubing, fittings, and valves, always use a backup wrench to stabilize and eliminate tension on both sides of the connection when tightening. Damaged connections may introduce leaks into the system resulting in inaccurate measurement.

6. Repeat step 5 for each tubing connection point.

The manifold and input lines are now installed. To leak-test the manifold and tap valve connections, see section 3.3, *Leak-test manifold and tubing connections,* page 10.

3.2   Direct mount installation

When mounting the flow computer directly on the meter run orifice, follow the instructions supplied with the manifold and stabilizer installation kits.

Materials:

— One (1) manifold (5-valve manifold)

— Two (2) stabilized manifold connectors (compatible with the manifold)

After installation, see section 3.3, *Leak-test manifold and tubing connections,* page 10, to leak-test the connections. Figure 3 shows a direct-mounted flow computer installed on a meter run.
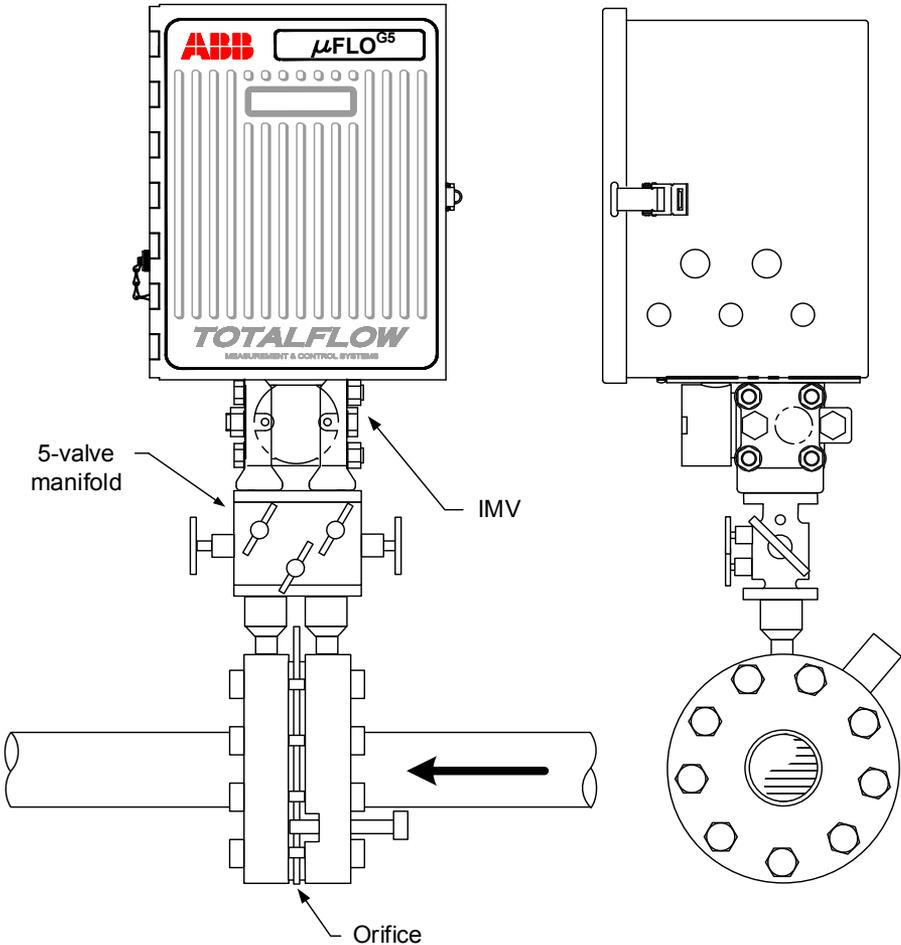
Figure 3: μFLO^{G5} flow computer with IMV attached to a 5-valve manifold (for illustrative purposes only)

3.3 Leak-test manifold and tubing connections

Manifold and tubing connections must be leak-tested prior to power application. Connection leaks between the orifice tap valves, the manifold, and the IMV can introduce measurement and calibration errors.

Materials:

— Liquid leak detector

— Pressure calibration device

> ⚠️ **DANGER – Serious damage to health/risk to life.** Manifold and tubing connection leaks could create a build-up of explosive gases in the immediate vicinity. Power should not be applied before the tubing and connections are leak-free and the area is ventilated and explosive gases have dissipated.

1. Open the equalizer valves (Figure 4, items A and B) and close the vent valve (item C).
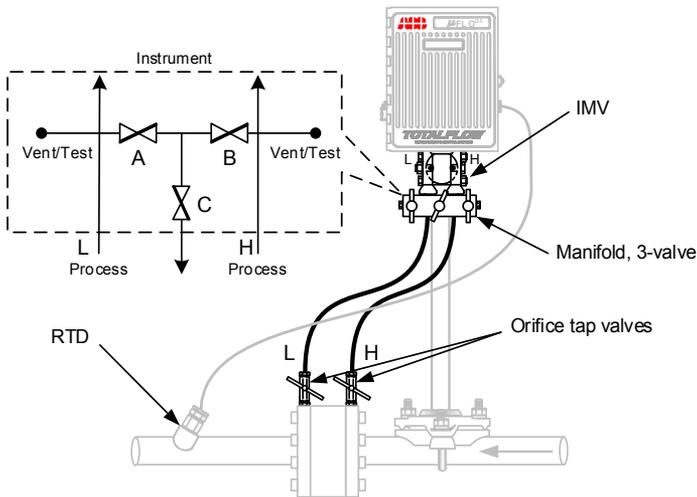
Figure legend:
A) Low side equalizer valve   H) High pressure side
B) High side equalizer valve   L) Low pressure side
C) Manifold vent valve

Figure 4: *µ*FLO^{G5} flow computer with IMV and 3-valve manifold

2. Connect the pressure device to the vent/test port.

3. Apply pressure to the port based on the transducer range (100% of range).

4. Squirt liquid leak detector onto the following connections:

   – High and low pressure tap valve connections

   – High and low pressure manifold tubing connections

   – Connection points between the flange and the manifold

5. Bubbles in the liquid indicate a loose or poor connection.

6. Using the appropriate size wrench, tighten any loose connections, then recheck with the liquid leak detector. Do not over-tighten the connections.

7. When all connections are leak-free, see section 4 to install an RTD.

4 RTD installation and wiring

The RTD probe measures flowing gas temperature. The following procedure indicates how to install the RTD into the meter run and wire the leads to the electronic board inside of the flow computer enclosure.

Materials:

— RTD probe with cable and cable gland installed (probe and cable length determined by technician)

— Nylon tie wraps

1. Insert the RTD probe into the thermowell to determine the depth setting for the probe spring (Figure 5).
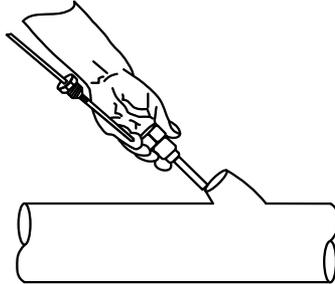
Figure 5: Typical RTD installation

2. Using snap-ring pliers, adjust the retaining ring below the spring on the probe (Figure 6). Probe depth should be set so that it is spring-loaded against the bottom of the thermowell.
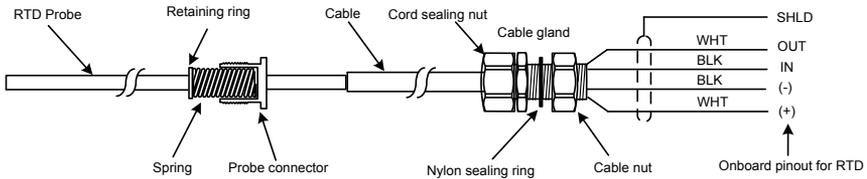
Figure 6: RTD probe connector

3. Screw the probe connector into the thermowell.

4. Run the RTD cable along the side of the process stream pipeline in a straight line. Use nylon tie wraps to secure the cable to the pipeline. Do not wrap the RTD cable around the pipeline.

5. Install the RTD cable into the flow computer enclosure:

    a. Remove a shipping plug from the right side of the flow computer enclosure.

    b. Remove the cable nut from the gland and insert the RTD cable end through the access hole in the enclosure. Leave enough cable inside the enclosure to accommodate wiring to the J3 RTD terminal block.

    c. Replace the cable nut on the cord and screw the cable nut onto the cable gland inside of the enclosure.

    d. Tighten the cord sealing nut to the cable gland against the RTD cable.

e. Secure the cable outside of the gland so that the cable turns down immediately. This will keep moisture from seeping into the housing along the RTD cable.

6. Wire the RTD sensor cable to the J3 terminal block using the wires identified in Figure 6, *RTD probe connector*, and the pinouts identified in Figure 7.
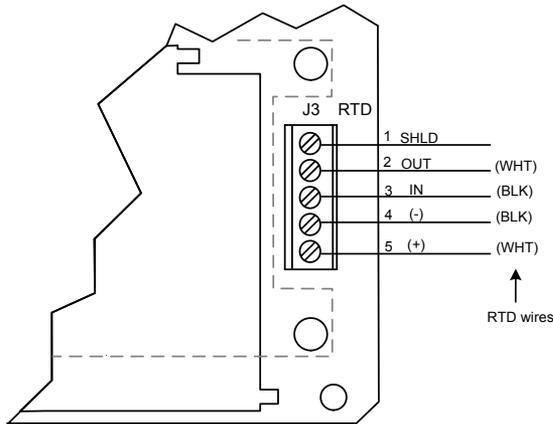
Figure 7: RTD sensor wiring to *µ*FLO^{G5} electronic board

> **WARNING – Bodily injury.** Electrical wiring must be installed according to requirements for the area classification. For further information, refer to the certification drawing indicated on the device's name tag, and national and local codes.
>
> Wiring peripheral devices to the flow computer electronic board should be performed prior to applying power. If the flow computer is already powered-up, disconnect power before performing any field wiring.

a. Open the flow computer enclosure door.

b. Using a small slotted screwdriver, remove the terminal connector from the J3 terminal block on the electronic board.

c. On the RTD probe wire, remove the spade lugs if installed, and trim the wire cover ends back ¼ inch (6.35 mm).

d. Loosen the screws for pins 1 through 5, insert the corresponding wires as identified in Figure 7, and gently retighten.

> **NOTICE – Property damage.** Do not overtighten the terminal connector screws as this may damage the wires.

e. Replace the terminal connector in the J3 terminal block.

Installation of the RTD is complete. See section 5, *Power equipment installation.*

5 Power equipment installation

The flow computer has two power options:

— 12 volt battery with a solar panel charger (section 5.1)

— External power (section 5.2, *External power supply*, page 17)

5.1 Battery with solar panel charger

The battery supplies the flow computer with operating power. The solar panel charging system uses sunlight to recharge the battery. The following subsections provide instructions for the installation of a typical system. These instructions should be adapted for alternate installations.

5.1.1 Solar panel installation

The solar panel is designed for outdoor mounting on a 2 inch pipe. When the flow computer is pipe-mounted, the solar panel may be installed on the upper end of the mounting pipe or an extension may be added. For wall- or direct-mount flow computer installations, the solar panel may be mounted on a stand-alone pipe or the top or side of a meter house.

IMPORTANT NOTES: For questions about mounting the solar panel on the top or side of a meter house, call the main office listed on the back cover of this guide and select technical support from the menu options.

For optimum charging, avoid placing the solar panel where it will be in shadows for any part of the day.

Clean the solar panel on a regular basis to ensure maximum charging.

Materials:

— One (1) solar panel with cable

— One (1) solar panel mounting kit (includes U-bolts, brackets, and hardware)

— Mounting pipe extension and coupling if required (length determined by technician depending on the size of the solar panel)

— Nylon tie wraps

NOTICE – Property damage. Exercise caution when handling the solar panel to avoid damaging it.

To install the solar panel:

1. Verify that the solar panel is operating properly before installation:
   a. Check the solar panel using a digital voltmeter to verify polarity and output voltage before installation.
   b. If the measured output voltage is within the manufacturer's specification, as defined by the specification sheet supplied with the panel, continue with the installation.
   c. If the measured voltage is out of specification, contact ABB for a replacement panel.
2. Install the mounting bracket on the solar panel using the provided hardware.
3. If installation requires a mounting pipe extension:
   a. Attach the pipe coupling to the top end of the flow computer mounting pipe.

b. Securely tighten the pipe coupling.

c. Attach the extension pipe to the pipe coupling.

4. Attach the solar panel mounting bracket to the top end of the mounting pipe with the U-bolts and associated mounting hardware (Figure 8). Do not tighten completely.
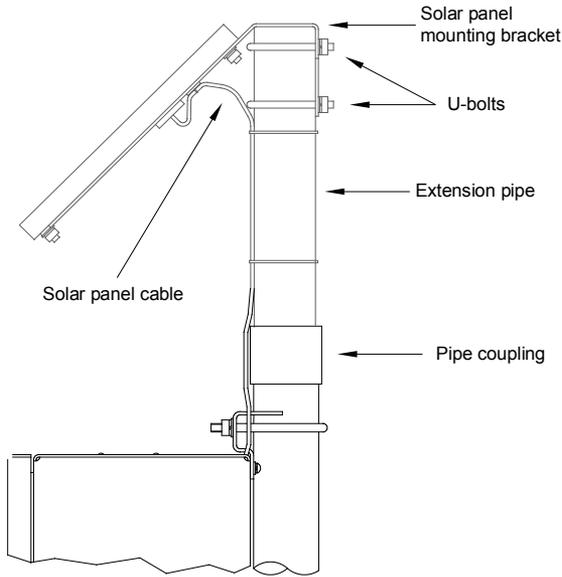
Figure 8: Solar panel installation

5. For northern hemispheres, position the solar panel facing south. For southern hemispheres, position the solar panel facing north.

> **IMPORTANT NOTE:** Ensure that the solar panel is correctly positioned before tightening the U-bolts.

6. Tighten the solar panel mounting hardware.

> **WARNING – Bodily injury.** Electrical wiring must be installed according to requirements for the area classification. Refer to the certification drawing indicated on the device's name tag, and national and local electrical codes.

7. Secure the solar panel cable to the pipe:

a. Run the solar panel cable along the mounting pipe and use nylon tie wraps to secure the cable. Do not wrap the cable around the mounting pipe.

b. Gather excess cable and attach it to the mounting pipe using a nylon tie wrap.

8. Install the cable and cable gland in the enclosure:

a. Remove a shipping plug from the left side of the flow computer enclosure.

b. Open the hinged door on the flow computer and visually locate the J17 EXT PWR / CHARGER terminal block.

c. Remove the cable nut from the cable conduit elbow and insert the cable and conduit ends through the access hole in the enclosure.

d. Pull the cable into the enclosure leaving enough cable to reach the J17 connecter.

e. Replace the cable nut on the cord and conduit end inside of the enclosure and screw the nut onto the conduit end finger-tight.

f. Position the conduit elbow so that moisture will not follow the cable and seep into the gland. Tighten the cable nut.

9. Wire the solar panel cable to the J17 EXT PWR / CHARGER terminal block:

a. Using a small slotted screwdriver, remove the terminal connector from the J17 terminal block on the electronic board.

b. On the solar panel cable, trim the wire cover ends back ¼ inch (6.35 mm) if necessary.

c. Loosen the terminal connector screws for pins 1 and 2.

d. Insert each solar panel cable wire, as identified by the cable label (+ or -), into the corresponding pin (1 or 2), as shown in Figure 9, and gently tighten the terminal connector screws.
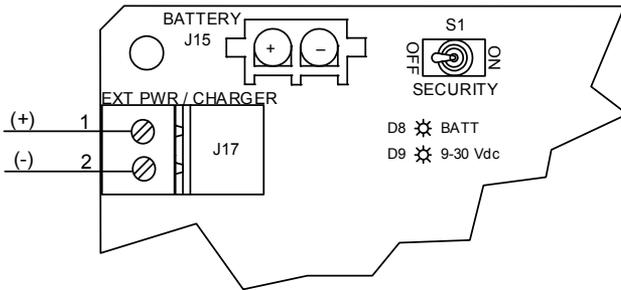
Figure 9: µFLO^{G5} power connections and power option selector

> ❗ **NOTICE – Property damage.** Do not overtighten the terminal connector screws as this may damage the wires.

10. Stop. Do not re-insert the EXT (J17) terminal connector into the terminal block until instructed to do so in section 7.

> ❗ **NOTICE – Property damage.** Connecting the solar panel to the electronic board before the battery has been connected will damage the board and void any warranty.

The solar panel charger wiring is now complete.

5.1.2 Battery installation

The battery is designed to mount inside of the flow computer enclosure and connect to the main electronic board. Before installation, inspect the power cables (where they terminate on the battery) and the connectors for breakage.

Material:

— One (1) battery with cable attached.

To install the battery:

1. Open the hinged door on the flow computer and visually locate the battery compartment (Figure 10).
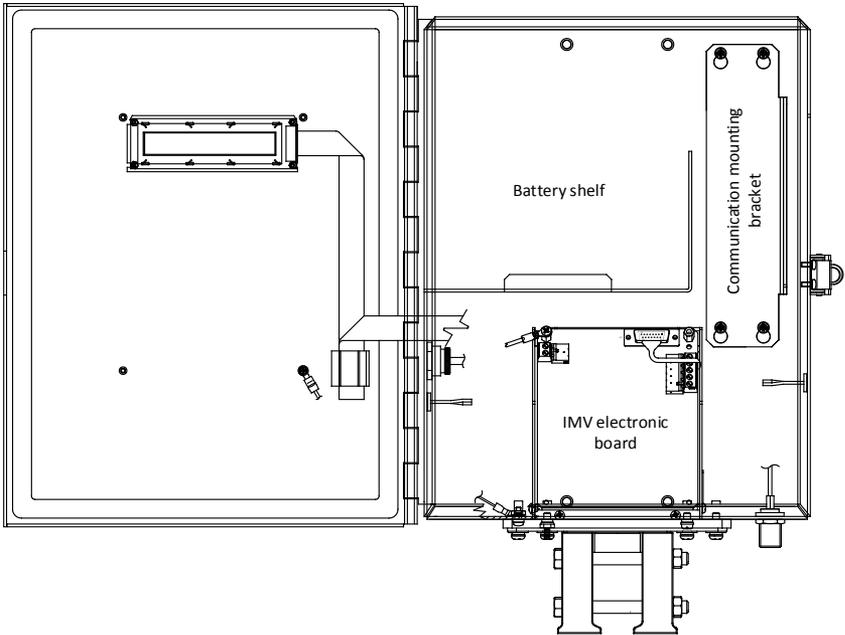
Figure 10: *μ*FLO^{G5} enclosure inside view

2. Place the battery on the compartment shelf, taking care to keep the battery terminals from contacting any metal surface inside of the enclosure.

WARNING – Bodily injury and property damage. Do not allow the battery terminals to come in contact with any metal surface. When the positive and negative battery terminals contact a conductive material it creates a short circuit and could result in sparks, property damage, and possible explosion.

3. Stop. Do not connect the battery cable into the BAT (J15) onboard connector until instructed to do so.

WARNING – Bodily injury and property damage. Wiring peripheral devices to the flow computer electronic board should be performed prior to applying power.

The battery and solar panel installation is now complete. Go to section 6, *Onboard wiring*, page 18.

5.2 External power supply

The flow computer may receive power from an optional ABB-approved external power supply.

WARNING – Bodily injury. Electrical wiring must be installed according to requirements for the area classification. Refer to the certification drawing indicated on the device's name tag, and national and local electrical codes.

To wire an external power source to the μFLO^{G5} board:

1. Install the external power supply, following the manufacturer's instructions supplied with the power supply.

2. The power source may be connected to the external power supply; however, do not activate power to the power supply yet.

3. Install the cable into the flow computer enclosure, adapting these instructions as necessary:

   a. Remove a shipping plug from the left side of the flow computer enclosure.

   b. Open the hinged door on the flow computer and visually locate the J17 EXT PWR / CHARGER terminal block.

   c. Remove the cable nut from the cable conduit elbow and insert the cable and conduit ends through the access hole in the enclosure.

   d. Pull the cable into the enclosure, leaving enough cable to reach the J17 connecter.

   e. Replace the cable nut on the cord and conduit end inside of the enclosure, and screw the nut onto the conduit end finger-tight.

   f. Position the conduit elbow so that moisture will not follow the cable and seep into the gland. Tighten the cable nut.

4. Wire the power supply cable to the J17 terminal block:

   a. Visually locate the J17 EXT PWR / CHARGER terminal block.

   b. Using a small slotted screwdriver, loosen the terminal connector from the J17 terminal block on the electronic board.

   c. Trim the power supply wire cover ends back ¼ inch (6.35 mm) if necessary.

   d. Loosen the terminal connector screws for pins 1 and 2.

   e. Insert each power supply cable wire (+ or -) into the corresponding pin (1 or 2), as shown in Figure 9, page 15, and gently tighten the terminal connector screws.

NOTICE – Property damage. Do not overtighten the terminal connector screws as this may damage the wires.

   f. Stop. Do not re-connect the external power supply terminal connector to the EXT (J17) onboard connector until instructed to do so in section 7.

WARNING – Bodily injury and property damage. Wiring peripheral devices to the flow computer electronic board should be performed prior to applying power.

The external power supply is now installed and wired.

6 Onboard wiring

The following information provides guidelines for enabling the real-time clock backup and wiring the onboard communication port, the digital I/Os, and the I/O expansion board, if installed. All onboard wiring should be completed before power is applied to the flow computer.

> **WARNING – Bodily injury and property damage.** When connecting or disconnecting any wires on the µFLO^{G5} electronic board, the board should not be receiving power and personnel must be properly grounded.

6.1 Lithium battery installation

The lithium battery maintains the real-time clock operating continuously in the flow computer should the power be lost or removed. To ensure that the continuity of the date and time is kept for accurate record keeping, the battery must be installed and connected to the µFLO^{G5} board.

> **IMPORTANT NOTE:** The purpose of the lithium battery in the µFLO^{G5} differs from legacy versions of the model in that, the battery maintains only the real-time clock, but does not provide backup to memory (RAM) as legacy models did. Refer to the *µFLO^{G5} User Manual*.

To install the lithium battery:

1. Open the hinged door on the flow computer enclosure and visually locate the LITH (J18) onboard connector and the lithium battery plug.
2. Plug the lithium battery cable onto the LITH onboard connector (J18) so that the red wire is making a connection to pin 1 and the black wire is making a connection to pin 4 (Figure 11).
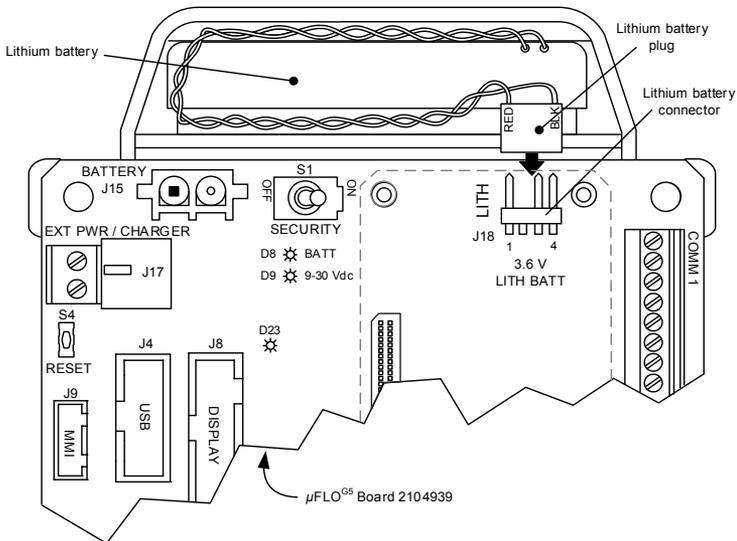
Figure 11: Lithium battery and connector

The lithium-backed real-time clock is now enabled.

6.2 Communication and onboard I/O

Figure 12 represents the *µ*FLO[G5] electronic board and identifies the terminal blocks, switches, and designated pinouts.

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IMPORTANT NOTE: The *µ*FLO[G5] electronic board differs from legacy versions. Communication termination, DO/DI, and power configuration are defined during the I/O setup using PCCU32.

Bus termination for the *µ*FLO[G5] onboard communication port differs from legacy flow computers. For the *µ*FLO[G5], when wiring COMM 1 for an RS-422 or RS-485 bus, and this is the last or only board in the series, bus termination must be selected in the communication setup in PCCU32 and will be detailed in *COMM 1 communication setup*, later in this guide.
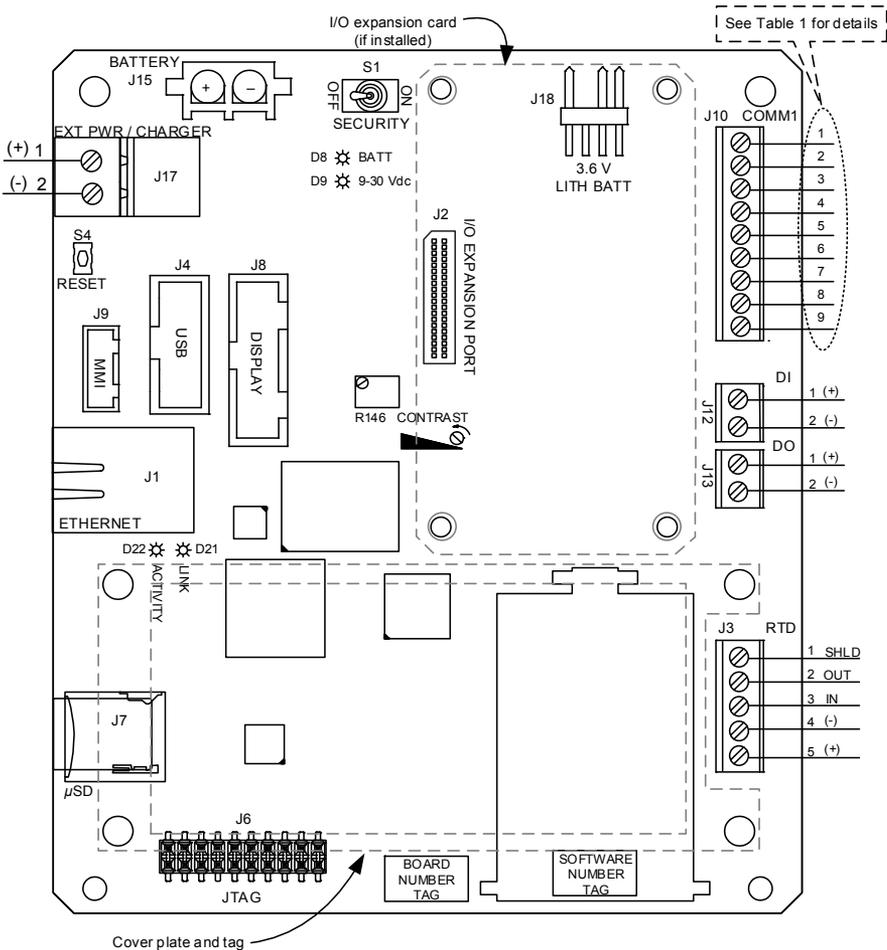
Figure 12: *µ*FLO[G5] board, pinouts, and communication

Pin designations for COMM 1, the communication terminal block (J10), are defined in Table 1.

Table 1: COMM 1 J10 pinouts

Pin	RS-232	RS-422	RS-485
1	Volts out	Volts out	Volts out
2	Ground	Ground	Ground
3	Switched volts out	Switched volts out	Switched volts out
4	Operate	Operate	Operate
5	N/A	Remote request to send	Remote request to send
6	Request to send	Transmit bus +	Transmit bus +
7	Transmit data	Transmit bus –	Transmit bus –
8	Receive data	Receive bus +	N/A
9	Clear to send	Receive bus -	N/A

i **IMPORTANT NOTES:** COMM 1, pin 1 (Volts out) and pin 3 (Switched volts out) output voltage is dependent upon the external power supply voltage connected to J17. Verify that all peripheral devices are compatible with the input voltage at J17 before connecting.

6.3   I/O expansion board

The I/O expansion board adds 1 software-selectable communication port (COMM 2), 2 AIs, 1 DI/PI, and 1 DO (Figure 13). The board installs onto the μFLO^{G5} expansion port (J2) shown in Figure 12, page 19. Table 2 defines the pinouts for COMM 2.
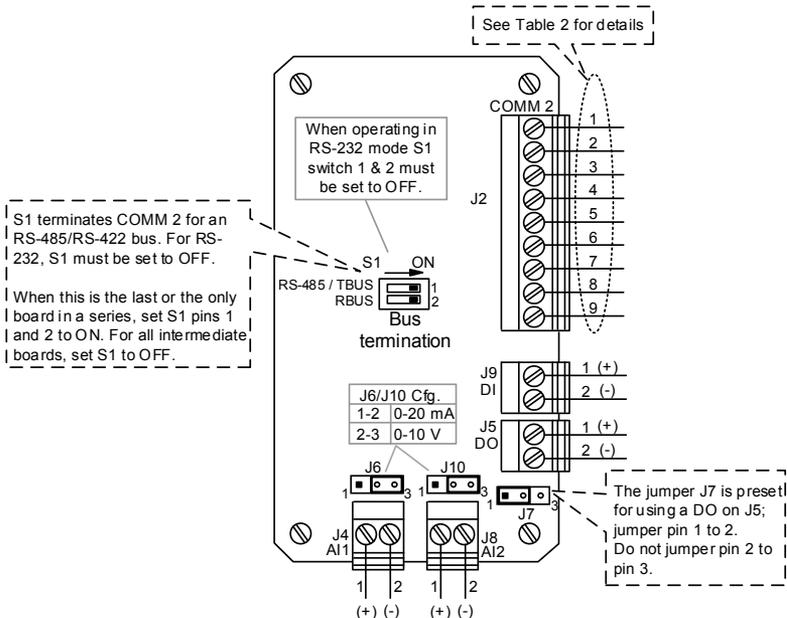
Figure 13: I/O expansion board

Table 2: I/O expansion board COMM 2 (J2) pinouts

Pin	RS-232	RS-422	RS-485
1	Volts out	Volts out	Volts out
2	Ground	Ground	Ground
3	Switched volts out	Switched volts out	Switched volts out
4	Operate	Operate	Operate
5	N/A	Remote request to send	Remote request to send
6	Request to send	Transmit bus +	Transmit bus +
7	Transmit data	Transmit bus –	Transmit bus –
8	Receive data	Receive bus +	N/A
9	Clear to send	Receive bus -	N/A

IMPORTANT NOTES: COMM 2, pin 1 (Volts out) and pin 3 (Switched volts out) output voltage is dependent upon the external power supply voltage connected to J17. Verify that all peripheral devices are compatible with the input voltage at J17 before connecting.

To install and wire the I/O expansion board:

1. Fit the I/O board connector (J1) onto the I/O expansion port (J2) on the main electronic board (Figure 12, page 19), but do not push down the board to seat.
2. Using a small slotted screwdriver, begin turning each captive screw a few turns each, moving sequentially to each of the 4 (four) corners of the board, to slowly seat the board into the onboard connector. Continue until the board is fully seated.
3. Field wire the required terminal connectors on the I/O expansion board:
   a. Using a small slotted screwdriver, loosen the terminal connector from the terminal block on the electronic board.
   b. Trim each wire cover end back ¼ inch (6.35 mm) if necessary.
   c. Loosen the terminal connector screws for the appropriate pins.
   d. Insert each wire into the corresponding pin, and gently tighten the terminal connector screws.

NOTICE – Property damage. Do not overtighten the terminal connector screws as this may damage the wires.

   e. Re-insert each terminal connector to the corresponding terminal block.
4. If COMM 2 is wired for communication:
   a. RS-422 or RS-485 communication:
      - And this is the last or only board in the series, then terminate the bus by setting the S1 switch pins 1 and 2 to ON.
      - And this is an intermediate board in the series, then set the S1 switch pins 1 and 2 to OFF.
   b. RS-232 communication, the S1 Switch pins 1 and 2 should be set to OFF.

5. If AI1 (J4) or AI2 (J8) is wired as a 0-20 mA input, then the configuration jumper pin (J6 or J10 respectively) must be moved to jumper pins 2 and 3.

> **ℹ** **IMPORTANT NOTE:** AI1 (J4) or AI2 (J8) configuration is set to the 0-10 volt configuration by default. The configuration jumper pins (J6 or J10 respectively) must have pins 1 and 2 jumpered.

The installation and wiring of the I/O expansion board is now complete. Additional software configuration may be required. Configuration is addressed later in this guide.

7   Power supply and charger connections

All wiring connections and jumper configurations on the flow computer and I/O expansion board should be completed before beginning this section.

— To connect the battery and a solar panel charger or ABB-approved battery charging source to the electronic board, see section 7.1.

— To connect an ABB-approved external power supply to the electronic board, see section 7.2, *External power supply*, on page 23.

> **ℹ** **IMPORTANT NOTE:** The μFLO^{G5} charger controller for the external power supply/charger terminal block (J17) is integrated and differs from legacy flow computers. The μFLO^{G5} internal charger controller does not require an onboard jumper to distinguish between an external power supply and an external charger.

7.1   Battery and charger connections

To connect the battery and a solar panel or other ABB-approved battery charging source:

1. Insert the battery connector into the electronic board's battery plug (Item J15, Figure 9, page 15).

2. Observe that the liquid crystal display (LCD) is cycling through the startup diagnostics sequence.

3. Confirm that the BATT LED is red (Item D8, Figure 9, page 15).

4. Connect the charging source terminal connector to the EXT PWR / CHARGER (J17) terminal block on the electronic board.

> **ℹ** **IMPORTANT NOTES:** An ABB-approved charging source is mandatory when a battery is connected to J15.
>
> The maximum allowable input voltage on J17 is 15.5 Vdc when a battery is connected to J15.
>
> When a battery is connected to the J15 terminal block, the real-time input voltage is measured and written to the Battery Voltage register in the I/O interface node in PCCU32.

5. Verify that all peripheral devices powered from the μFLO^{G5} are receiving power. If not, refer to the *Power Troubleshooting* section of the user manual listed earlier in the *Additional information* section of this guide.

7.2 External power supply

i **IMPORTANT NOTE:** Make sure that the external power supply voltage is 9 Vdc to 30 Vdc.

⚠ **WARNING – Equipment damage**. A battery cannot be used when the controller is in the EXT PWR mode.

To connect an ABB-approved external power supply:

1. Connect the power supply terminal connector to the EXT PWR / CHARGER (J17) terminal block on the electronic board.
2. Observe that the liquid crystal display (LCD) is cycling through the startup diagnostics sequence.
3. Confirm that the 9-30 Vdc LED is red (Item D9, Figure 9, page 15).

i **IMPORTANT NOTES:** When an external power supply is connected to the J17 terminal block, the real-time input voltage is measured and written to the External/Charger voltage register in the I/O interface node in PCCU32.

The allowable external power input voltage on J17 is between 9 and 30 Vdc.

The voltage supplied to peripheral devices powered from the μFLO^{G5} is dependent upon the power supply connected to J17. Verify that all peripheral devices are compatible with the input voltage at J17 before connecting.

4. Verify that all peripheral devices powered from the μFLO^{G5} are receiving power. If not, refer to the *Power Troubleshooting* section of the user manual listed earlier in the *Additional information* section of this guide.

8   Configure using PCCU32 software

Use PCCU32 software version 7.58 or newer to connect to and configure the μFLO^{G5} flow computer.

i **IMPORTANT NOTE:** Screen shots used in this guide may differ from actual displays. The primary reason may be because of view settings. There are 3 levels of screen view settings which are defined by technical ability: Basic, Advanced, and Expert. The default setting is Advanced.

8.1 Basic configuration

The following sections detail the setup for a basic configuration and include establishing local communication, station setup, and measurement application setup.

8.1.1 Establish local communication

1. Connect the laptop or PC running PCCU32 to the flow computer with either an MMI cable (RS-232) or a USB cable.

2. Launch the PCCU32 software program by double-clicking the desktop icon or selecting **PCCU32** from the **Start** > **Program** menu.

3. Define the local connection parameter:

   a. Click the **Setup** icon on the toolbar or click **Operate** > **Setup** > **System Setup**.

   b. On the **PCCU Com. Port** menu under **Connection Parameters**, select the PC communication port containing the local cable connection (Figure 14).
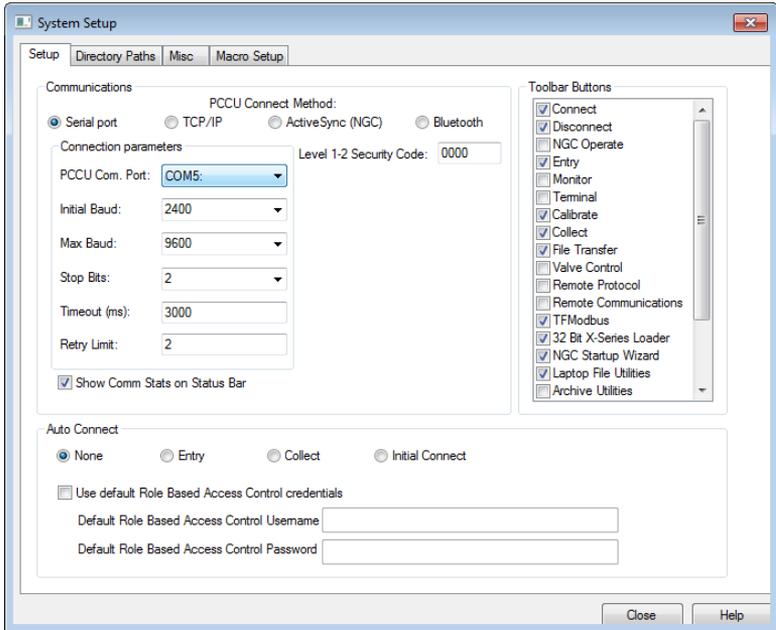
Figure 14: Local communication setup

   c. Click **Close**.

4. Click the **Entry** icon on the PCCU32 toolbar (Figure 15) to connect to the flow computer and go directly to the **Entry mode** user interface (Figure 16).

> **IMPORTANT NOTE:** If local communication fails, it may be necessary to edit the System Setup screen by entering a valid security code (default is 0000) or by making adjustments to the communication parameters. For more information about the security code, refer to the *Startup* section of the user manual listed earlier in the *Additional information* section of this guide.

Connect to Entry mode

Toolbar
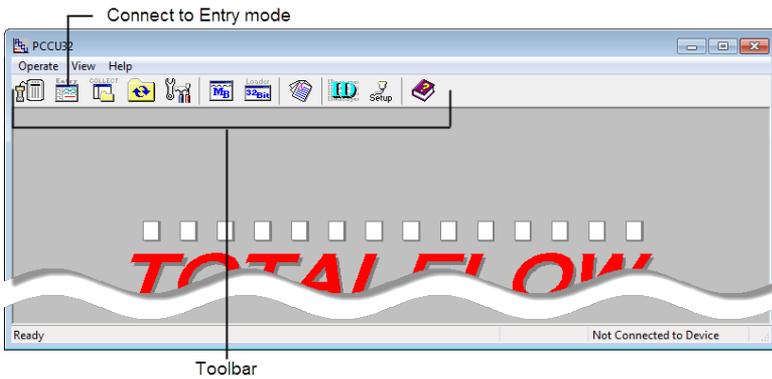
Figure 15: Local connection screen

IMPORTANT NOTES: The first time PCCU32 communicates with a new flow computer, a dialog box will indicate that the flow computer and PCCU32 date and time do not agree. Select **Yes** to set the flow computer date and time. Selecting **No** will require the date and time be set during *station setup* covered later in this guide.
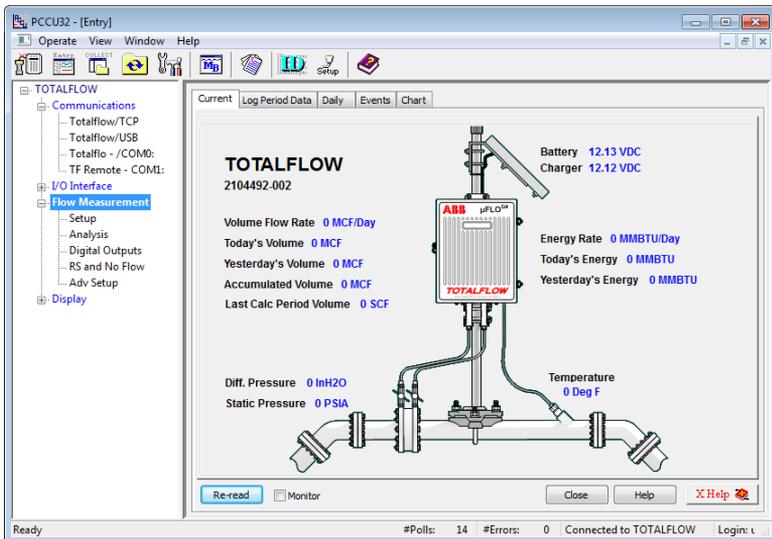
Figure 16: User interface

8.1.2   Station setup

To set up the flow computer station:

1.   Click the top node of the navigation tree, the **Station ID** name (Figure 17), to see the **Station Setup** screen.
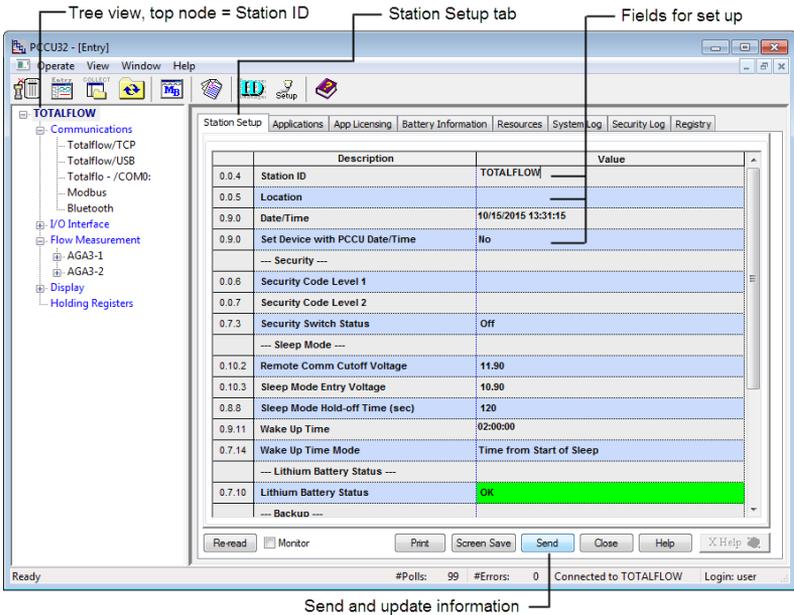
Figure 17: Station Setup screen

2.   On the **Station Setup** tab, change the following settings, if necessary, and any other settings that may need to be changed:

–   **Station ID**: A unique 10-digit alphanumeric identifier that differentiates one device from another

> **IMPORTANT NOTES:** Multiple measurement applications may reside in the device and each application should also be uniquely identified by editing the application ID, [**measurement application**] > **Setup** > **Device/APP ID**.
>
> Each added application will have unique setup requirements. Information about setting up applications is located in the PCCU32 Help files.

–   **Location**: A 24-digit alphanumeric description of the device location

–   **Date/Time**: This field displays the current date and time values. A request to reset this field should have been received when local communication was first established. If this field is not correct, select **Yes** from the value field submenu.

3.   Click **Send** when all changes and selections have been made.

8.1.3   Measurement application setup

To set up the flow computer measurement application:

1. In the navigation tree, click **Flow Measurement** > **Adv Setup** (Figure 18).
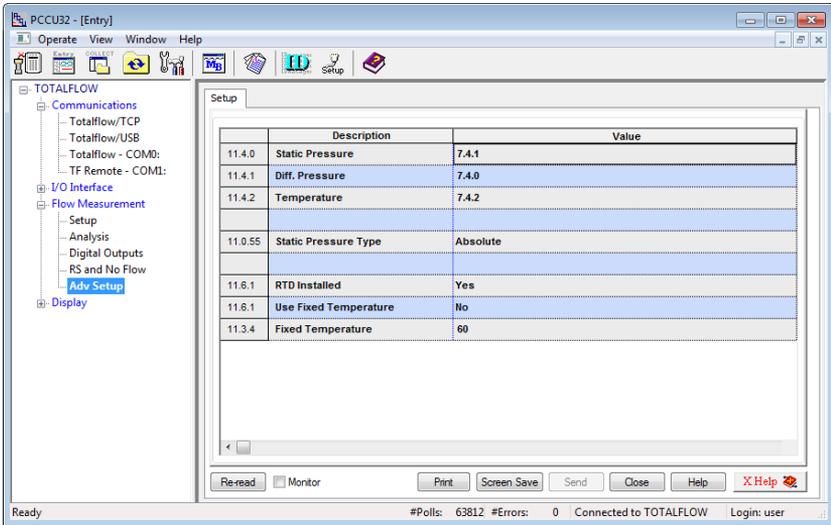
Figure 18: Measurement Adv Setup tab

2. On the **Setup** tab verify, and change if necessary, the following settings and any other settings that may need to be changed:

   – **RTD Installed**: Select **Yes** if live readings from an RTD are used for flowing temperature.

   – **Use Fixed Temperature**: Select **Yes** if using a fixed temperature instead of live readings.

   – **Fixed Temperature**: Enter the value to be used for the fixed temperature.

3. In the navigation tree, click **Flow Measurement** > **Setup**.

4. On the **General** tab (Figure 19) verify, and change if necessary, the following settings and any other settings that may need to be changed:

   – **Calculation Type**: Select the calculation standard for this tube.

   – **Fpv Method**: Select the compressibility method for this tube.
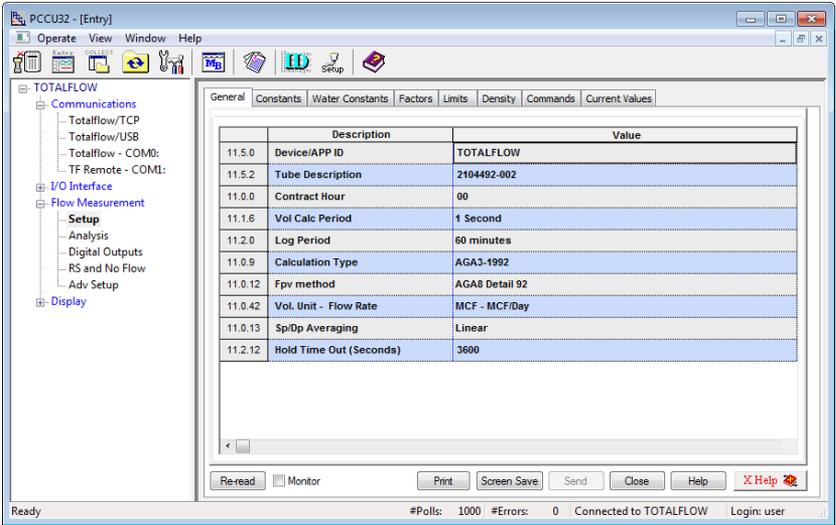
Figure 19: Measurement setup tabs

5. Click **Send** when all changes and selections have been made.

6. Select the **Constants** tab.

7. Verify, and change if necessary, the following settings and any other settings that may need to be changed:

   – **Barometric pressure**: Enter the value, which is subtracted from the absolute pressure readings when calibrating in gauge pressure.

   – **Orifice diameter**: Enter the orifice plate diameter in inches.

   – **Pipe diameter**: Enter the pipe diameter in inches.

   – **Temperature base (Tb)**: Enter the value as defined by the existing contractual agreement (default is 60 °F).

8. Click **Send** when all changes and selections have been made.

9. Continue to the other tabs and verify, or change if necessary, the other settings.

10. Click **Send** when all changes and selections on each tab have been made.

11. Select the **Commands** tab.

12. Select **Yes** from the **Reset Volume** sub-menu to perform a volume reset.

13. Click **Send** and select **Yes** on the verification screen to reset the volume.

This completes the basic setup for a single measurement tube.

8.2   Remote communication configuration

ⅰ **IMPORTANT NOTE:** These instructions are only applicable if remote communication wiring was installed during installation and if it conforms to the pinouts and switch settings provided in section 6.2, *Communication and onboard I/O,* on page 19.

To communicate with a remote host, the *µ*FLO^G5 uses the remote communications port (COMM 1) which can function as an RS-232, RS-422, or RS-485 port. If the I/O expansion board was installed to enable COMM 2, then additional setup is required (see Section 8.2.2, *COMM 2 communication* setup, page 31).

8.2.1   COMM 1 communication setup

The following instructions provide steps to configure a typical communication port.

1. In the navigation tree, click **Communications** (Figure 20).

ⅰ **IMPORTANT NOTE:** In a standard configuration, the *µ*FLO^G5 is shipped with TF Remote - COM1: for port name and Totalflow Remote for protocol as the default for protocol.
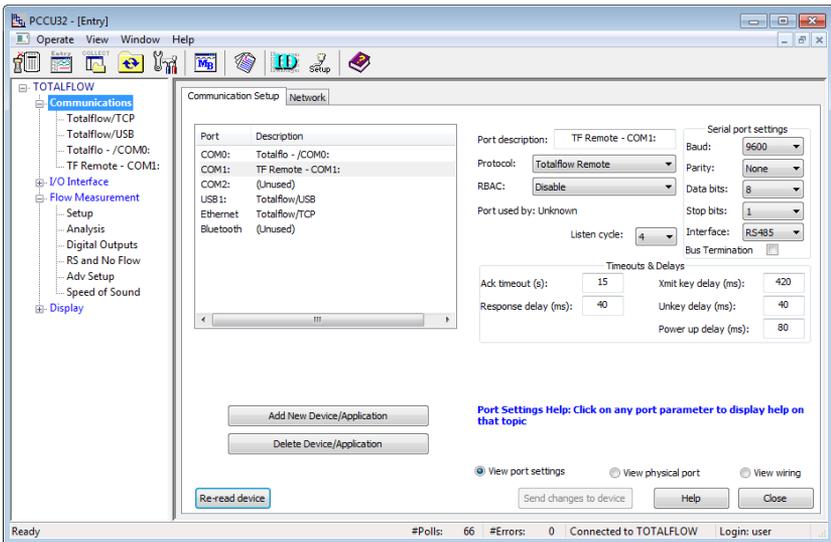
Figure 20: Communications setup screen

2. Highlight the **COM1: TF Remote – COM 1:** port.
3. On the **Protocol** menu, select the appropriate protocol.
4. On the **Interface** menu, under **Serial port settings**, select the communication interface (RS-232, RS-422, RS-485, or RS-232 Modem).

5. Verify, and change if necessary, the remaining serial port settings and timeouts and delays (Table 3).

Table 3: Communication setup parameters

Timeouts and delays		Serial port settings	
Parameter	Default	Parameter	Default
Ack timeout (s)	15	Baud	9600
Response delay (ms)	40	Parity	None
Xmit key delay (ms)	420	Data bits	8
Unkey delay (ms)	40	Stop bits	2
Power up delay (ms)	80		

6. For RS-422 and RS-485 communication:
   a. Select the **Bus Termination** check box if this is the last or only board in the series.
   b. If this is an intermediate board in the series, verify that the **Bus Termination** check box is clear.

7. Click **Send changes to device** after all values have been set.

8. Observe the LCD on the enclosure door. The annunciator, position A8, should periodically flash the ‡ symbol to indicate that the COM1 port is active and listening for communication (Figure 21).
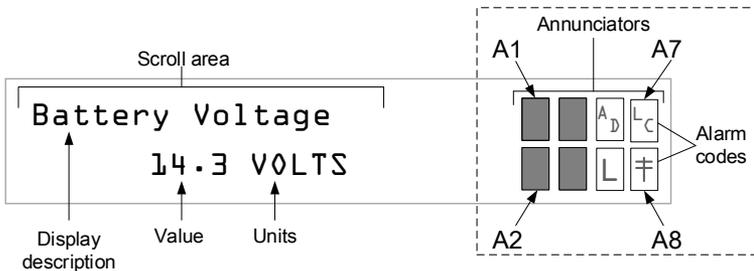
Figure 21: μFLO^{G5} annunciators

> **i** **IMPORTANT NOTES:** The ‡ symbol flashes according to the Listen Cycle defined for the communication port. The default Listen Cycle is 4. If set to zero, the symbol should be displayed continuously. See the PCCU32 Help files for communication port setup to learn how this setting effects power usage.
>
> For a full description of the alarm characters, locations, and descriptions, see section 10.1, *Visual alarm and status codes*, on page 33.

9. To set up and schedule the remote communication port for power conservation:
   a. Select the communication port node in the navigation tree. For example, **TF Remote – COM1:**
   b. Select the **Schedule** tab. Parameter definitions may be located by clicking **Help**.
   c. Click **Send** after all values have been set.

10. If **RS-232 Modem** was selected in step 4:

   a. Select the **Modem** tab to set up modem parameters. Parameter definitions may be located by clicking **Help**.

   b. Click **Send** after all values have been set.

COMM 1 communication configuration is now complete.

8.2.2 COMM 2 communication setup

When the I/O expansion board is installed for an additional communication port, COMM 2 must be set up in PCCU32. Use the following procedure to set up COMM 2:

1. Click **Communications** in the navigation tree (Figure 22).
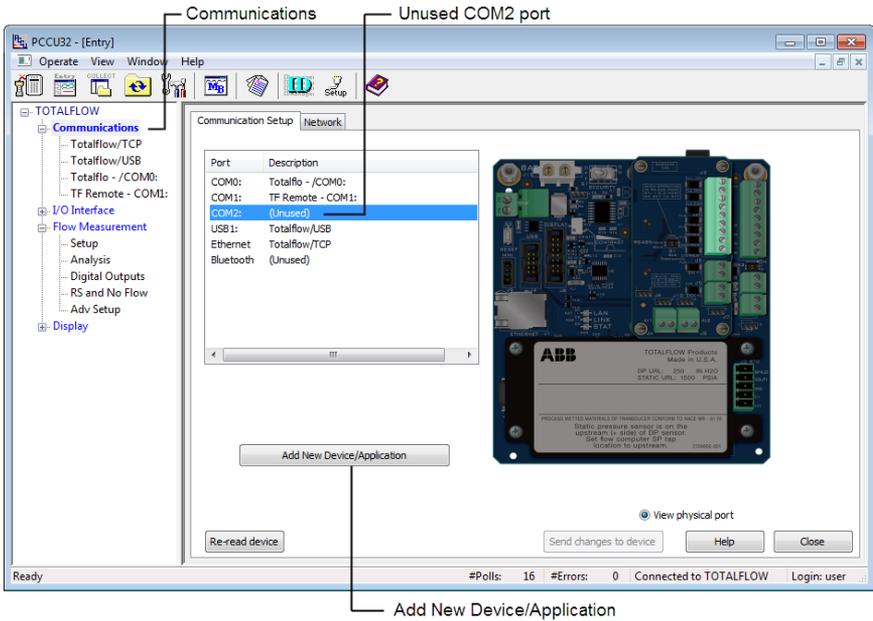
Figure 22: Add the I/O expansion communication port

2. Highlight the **COM2: (Unused)** port and click **Add New Device/Application.**

3. On the **Select Application** menu select the type of communication being added. For RS-232/422/485, select **Generic Com App** (Figure 23).
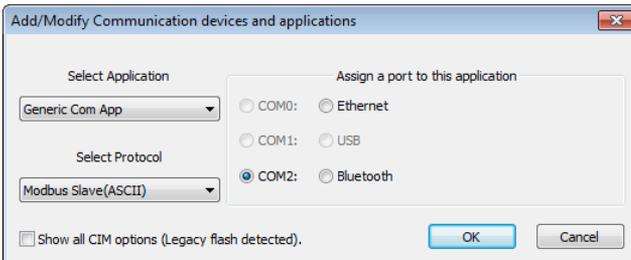
Figure 23: COMM 2 port definition

i **IMPORTANT NOTE:** For additional information about other communication applications, click **Cancel** and click **Help** on the previous screen.

4. On the **Select Protocol** menu select the appropriate protocol.
5. Assign a port to this application by selecting **COM2:** and click **OK**.
6. In the Communication Setup screen, define **COM2**:
   a. Highlight **COM2:** [Generic Com App or other communication type] and type an appropriate description in the description field. For example: **TF Remote - COM2**.
   b. Verify or change other fields as required.
   c. Click **Send changes to device** when all changes and selections have been made.

i **IMPORTANT NOTE:** The navigation tree should reflect the additional port added as named in step 6a.

COMM 2 communication configuration is now complete.

9 Commission the *µ*FLO^{G5}

Commissioning the *µ*FLO^{G5} is a two-part process. The flow computer measurement must be validated and then the flow computer put into service.

9.1 Validate the measurement

The *µ*FLO^{G5} is calibrated at the factory before shipping. However, shipping and installation may introduce errors into the measurement results. Pressure checks should be completed before commissioning the flow computer to verify measurement accuracy.

i **IMPORTANT NOTE:** For applications that require calibration to the end user's standards, refer to the *Calibration* section in the user manual listed earlier in the *Additional information* section of this guide.

1. Perform static pressure (SP) and differential pressure (DP) calibration pressure checks. For more information about calibration pressure checks refer to the *Calibration* section of the user manual, listed earlier in the *Additional information* section of this guide.
2. If it is necessary to correct errors in the measurement system, proceed to the calibration instructions in the user manual.

9.2 Place the transmitter in service

The following instructions provide general guidelines for placing the transmitter in service:

i **IMPORTANT NOTE:** The following procedure is based on the flow computer attached to a 3-valve manifold. For all other applications, these instructions should be adapted to the specific manifold.

1. Verify the high and low pressure tap valve connections on the stream are closed to shut off the process flow (Figure 4, items L and H, page 10).
2. Verify that the equalization valves (items A and B) are open.
3. Verify that the manifold vent valve (item C) is closed.
4. Slowly open the stream tap valves (items H and L) to open the process stream, creating flow. Wait until the system has pressurized, typically less than 1 minute, before continuing.
5. Close the equalizing valves (items A and B) on the manifold. The transmitter is now commissioned into operation.

The flow computer is now in service.

10 Troubleshooting information

This section discusses a few potential issues that may be encountered during the initial startup of the flow computer:

— Visual alarms and status codes
— Liquid crystal display (LCD) does not cycle
— Remote communication failure

i **IMPORTANT NOTE:** For complete troubleshooting instructions refer to the *Troubleshooting* section of the user manual listed earlier in the *Additional information* section of this guide.

10.1   Visual alarm and status codes

Alarm and status codes are displayed in the annunciator area of the LCD (Figure 24). When an alarm condition is triggered in the flow computer, the alarm condition is indicated on the LCD and the condition is recorded in the log period flow record. Status codes are also displayed in the annunciator area, and indicate the operating status of the defined item, but are not recorded in the log period flow record.
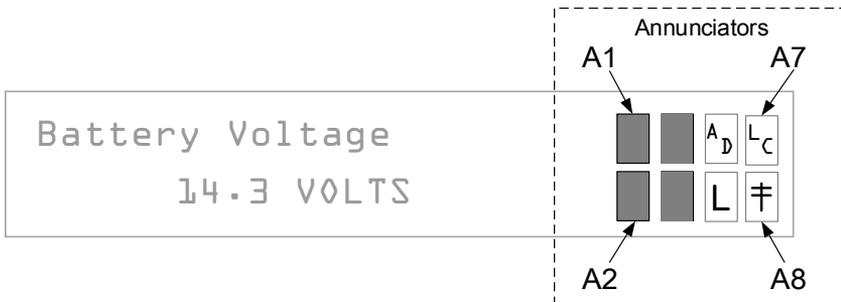
Figure 24: *µ*FLO^{G5} annunciators

The status and alarm code area is customizable. Each of the 8 annunciator display fields, shown in Figure 24, may be programmed to display any of the available indicators, in any of the 8 locations.

Specific troubleshooting instructions for alarm code indicators are located in the *Troubleshooting* section of the user manual listed earlier in the *Additional information* section of this guide.

Table 4 defines each available indicator.

Table 4: μFLO^{G5} status and alarm codes

Indicator	Description
System	
LL	Low Lithium Battery Alarm: When LL (low lithium) is displayed, the lithium battery voltage is below 2.5 Vdc. A new lithium battery measures approximately 3.6 Vdc.
LC	Low Charger: When LC (low charger) is displayed, the μFLO^{G5} battery charging voltage is (+) 0.4 Vdc, or is less than or equal to the battery voltage.
Communication Protocols	
→	Transmitting Data: Sending a response
←	Receiving Data: Processing request
!	Nak: Negative acknowledgement with packet list
+	Ack: Positive acknowledgement of receipt of request
帀	Waiting for Ack: Waiting for response after transmission
?	Exception Alarm Processing
¥	ID Recognized: Recognized and receiving request
‡	Listen Cycle: Flashes if this remote port is active and running Totalflow Remote Protocol. Flashes in sync with the listening cycle that occurs at 1, 2 or 4 second intervals. When the baud rate is faster than 2400, then the flashing symbol may not be visible. The annunciator will remain on listening cycle if the listen cycle is set to zero.
M	MODBUS® ASCII: MODBUS® ASCII protocol is selected for the port assigned to this annunciator.
m	MODBUS® RTU: MODBUS® RTU protocol is selected for the port assigned to this annunciator.
L	Local Protocol: Displayed when the PCCU32 port is active and running Totalflow Local Protocol
¥	ID Recognized: The ID has been recognized but is waiting for sync.
u	USB Protocol: Displayed when the USB port is active and running Totalflow Remote
n	Ethernet Protocol: Displayed when the Totalflow/TCP port is active.
Measurement Applications	
BF	Back Flow Condition: Visible only when DP variable is displayed
Z	Zero Flow Condition: Visible only when the flow rate is displayed
H	Hold: Displayed when PCCU32 has entered hold
A	Alarm Condition: Need to view alarm. Compare application limits to the current values to determine where the alarm condition is present.
AD	A to D Failure: Displayed if the A to D converter's absolute differential pressure, absolute static pressure, or temperature readings exceed the maximum counts or are less than the minimum counts
Display Applications	
1	A number represents the Display Group number currently being displayed.
↑	The displayed item's value is above the Data High Limit value that is specified on the display Item Setup screen.

Indicator	Description
↓	The displayed item's value is below the Data Low Limit value specified on the display Item Setup screen.

10.2   Liquid crystal display (LCD) does not cycle

When the device is first powered, it should move through the startup routine and begin cycling through the pre-programmed display items (Figure 25).

Screen 1

```
Totalflow 32 Bit XSeries

Loading Boot Loader ...
```

Screen 2

```
Totalflow 32 Bit XSeries

Loading Linux OS...
```

Screen 3

```
Backup CAP fully charged
```

Screen 4

```
Totalflow.exe Startup

Exe Part No. 2105298-xxx
```

Begin to scroll standard displays

```
Station ID

        Totalflow
```
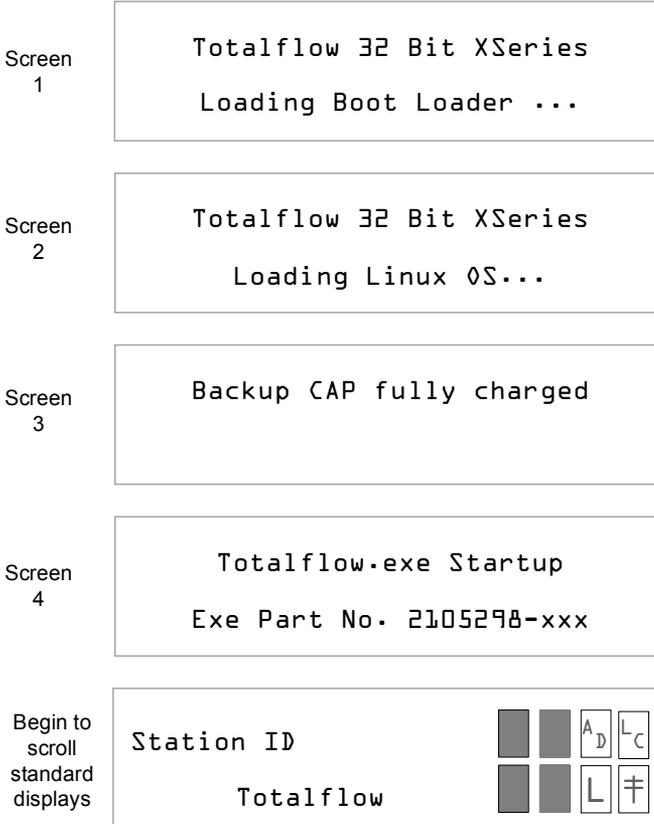
Figure 25: Display startup messages (part numbers for example only)

IMPORTANT NOTE: Individual display times for screens 1 through 4 will vary. It is not necessary to observe all 4 screens; however, if the startup cycle stops on one screen it will be beneficial to note the details on that screen in the event that it becomes necessary to call technical support.

If the screen does not continue to cycle as expected or appears to be locked up, follow this procedure to correct the problem:

1.   Verify that the lithium battery is plugged into the board.

> **!** **NOTICE – Loss of data.** If the lithium battery is disconnected from J18, do not attempt a warm boot. Continuing this procedure without the lithium battery being connected will result in a Cold boot and a loss of clock time.

2. Perform a warm boot:

   a. Locate **Reset** (S4) on the μFLO^{G5} main electronic board (Figure 12, page 19), press and hold for 10 seconds.

   b. View the screen during startup to verify that the unit warm starts and begins cycling.

      i. If the display moves through the startup screens and begins cycling correctly, the reset was successful and it is not necessary to continue this procedure.

      ii. If the display does not begin cycling correctly or locks on one of the startup screens, continue to step 3.

3. Perform a cold boot if the display still does not cycle properly:

   a. Disconnect the lithium battery plug from J18.

   b. Locate **Reset** (S4) on the μFLO^{G5} main electronic board (Figure 12, page 19), press and hold for 10 seconds.

   c. View the screen during startup to verify that the unit initiates a cold start and begins cycling.

      i. If the display moves through the startup screens and begins cycling correctly, the reset was successful and it is not necessary to continue this procedure.

      ii. If the display does not begin cycling correctly or locks on one of the startup screens, contact technical support for additional instructions.

> **i** **IMPORTANT NOTE:** To reach technical support, call the ABB Totalflow main office, listed under *Contact us* on the back cover of this guide, and select *Technical support* from the menu options.

10.3   Remote communication failure

Installation, wiring, and setup of a new radio or modem that does not communicate is difficult to troubleshoot. Because proper operation has not been proven, all wiring and software setup steps should be suspect and it is possible that more than one issue may exist. To troubleshoot remote communications, use the following list to eliminate possible issues (in any order):

— Verify that the ✝ symbol flashes in the A8 display position (Figure 24, page 33). This indicates that the port is actively running Totalflow Remote Protocol and each flash identifies the Listen Cycle time period.

   – If the ✝ symbol is not flashing, then:

      - Set the port Listen Cycle to zero. The symbol should display continuously.

      - Verify that Totalflow Remote Protocol is selected in PCCU32 Entry mode (see section 8.2, *Remote communication*, page 29).

      - Increase the communication cutoff voltage specified in **Station Setup** > **Remote Comm. Cutoff Voltage** (default is 11.9 Vdc and the range is 9–12 Vdc).

— Verify that all of the communication wiring is correct:

   – The communication port wiring on the flow computer electronic board

—   The communication port wiring on the radio
—   All communication cables are intact and undamaged.

— Verify that the antenna is properly installed:
     — The antenna is properly wired to the radio.
     — The antenna frequency range is correct.
     — The directional antenna is pointed towards the base radio (±6°).
     — The antenna is mounted vertically and the vanes are perpendicular to the ground.

— Verify that the base radio (Host device, typically running WinCCU) is working for other locations and that it is using the same frequencies as the remote radio.

— Verify at the host communication device (typically WinCCU) that:
     — The Station ID and the Device ID match the host settings.
     — No other device is using the same Station ID or Device ID.
     — The Baud rate, Stop bits, Security code, and Listen cycle time agree between the host (WinCCU) device and flow computer.
     — The host (WinCCU) is using packet protocol.

For more information about identifying and correcting radio communication issues, refer to the *Communication troubleshooting* section of the user manual listed earlier in the *Additional information* section of this guide.

For troubleshooting other communication equipment, including modems, cellular equipment, or telephone line, contact the ABB Totalflow main office, listed under *Contact us* on the back cover of this guide and select *Technical support* from the menu options.

Notes:

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